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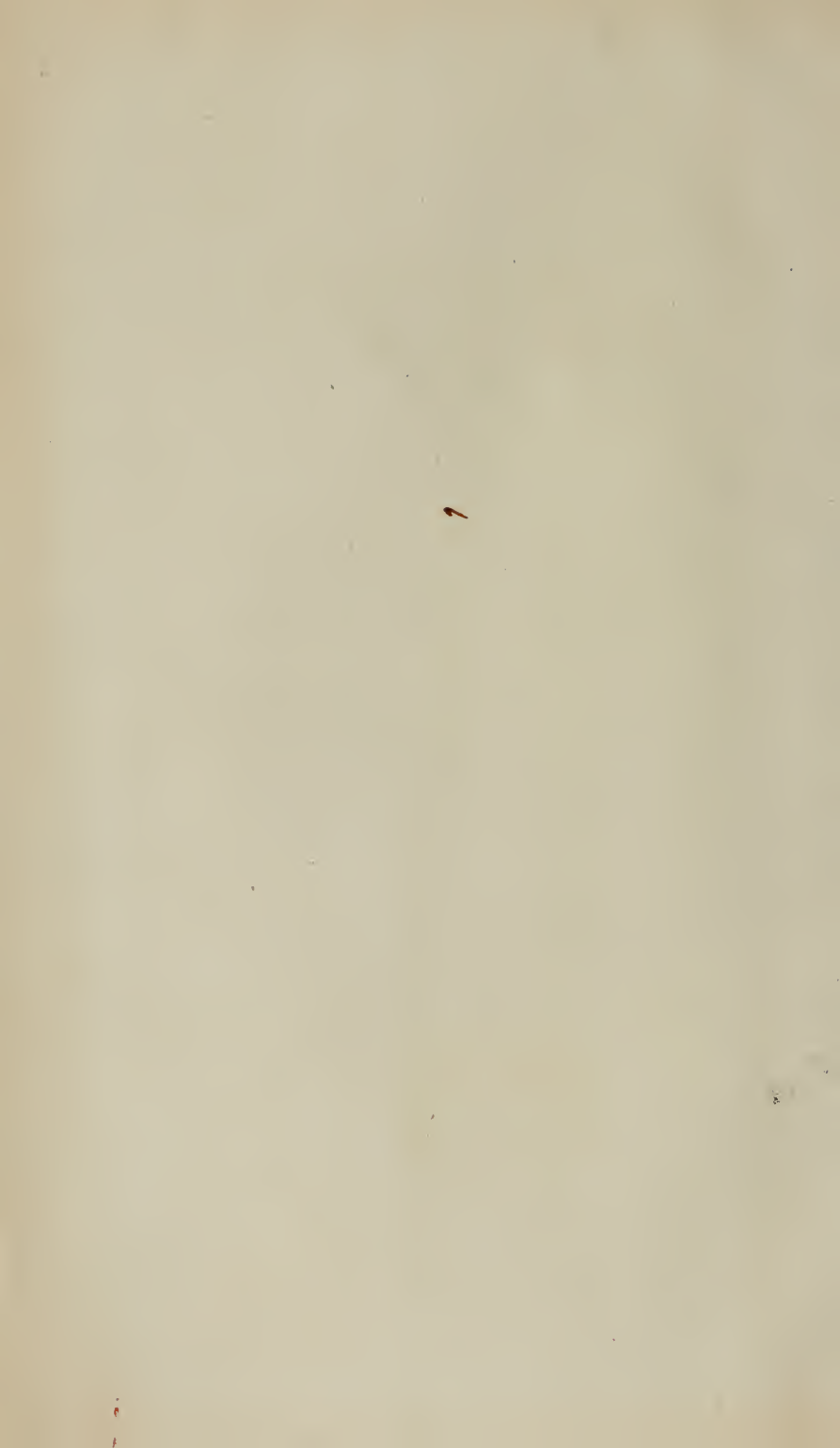














JOURNAL  
OF THE  
ASIATIC SOCIETY OF BENGAL,

EDITED BY  
THE SECRETARIES.

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VOL. XVIII.

PART I.—JANUARY TO JUNE, 1849.

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“It will flourish, if naturalists, chemists, antiquaries, philologers, and men of science, in different parts of Asia will commit their observations to writing, and send them to the Asiatic Society at Calcutta. It will languish if such communications shall be long intermitted; and it will die away if they shall entirely cease.”—SIR WM. JONES.



CALCUTTA :

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1849.

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## ANNUAL REPORT.

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THE Council of the Asiatic Society submit with much satisfaction their Annual Report, shewing the state of the Society's affairs during the year just expired.

During that period the Society have had to deplore the death of seven members, of whom two, the Hon'ble Sir J. P. Grant and Sir Henry Wilmot Seton, long held the office of Vice Presidents of the Society, and were distinguished for the deep interest they ever evinced in its prosperity and usefulness. In the same list too the Council have to record the names of Major General Hodgson, Colonel Stacy and Colonel Wilcox, as authors of valuable contributions to the Society's publications.

By departure to Europe—the loss of members has been 10, of whom Colonel Forbes, a Vice President, is expected to return immediately, three others in a year or two, and six may be considered as permanently separated from our ranks.

By actual *withdrawal* the diminution has been 19, of whom 14 have attributed their secession to the pecuniary difficulties which have been felt so severely during the past year by all classes of the community.

While we have thus permanently lost 32 members, 26 new members have been elected, and 5 have returned from Europe, leaving our numbers practically the same as at the close of 1847, being subscribing members, actually in India, 159.

### FINANCES.

The Council submit with pleasure an abstract statement of the receipts and disbursements for the year 1848.

|                                                           |            |    |    |
|-----------------------------------------------------------|------------|----|----|
| This exhibits Receipts from all sources, .....            | Rs. 28,100 | 1  | 7  |
| Expenditure, .....                                        | 27,027     | 2  | 11 |
| Balance to acct. in Cash and in the Bank of Bengal, ..... | 1,072      | 14 | 8  |

*Of which received from Government (Annual.)*

|                                    |           |   |   |
|------------------------------------|-----------|---|---|
| For Oriental Grant, .....          | Rs. 6,000 | 0 | 0 |
| For Museum Economic Geology, ..... | 3,000     | 0 | 0 |
| For ditto ditto, .....             | 768       | 0 | 0 |
| For Museum Zoology, .....          | 3,000     | 0 | 0 |
| For ditto ditto, .....             | 600       | 0 | 0 |

Rs. 13,368 0 0

*From Society's resources.*

|                                                                 |           |    |   |
|-----------------------------------------------------------------|-----------|----|---|
| From Journal, .....                                             | Rs. 1,964 | 12 | 0 |
| Subscriptions and Admission fees, .....                         | 9,994     | 15 | 2 |
| Sale of Oriental Works, .....                                   | 928       | 0  | 0 |
| Contributions from Members for the purchase of Furniture, ..... | 800       | 0  | 0 |
| Miscellaneous, as per detailed Account, .....                   | 132       | 6  | 6 |

Total Rs. 13,820 1 8

|                             |     |    |    |
|-----------------------------|-----|----|----|
| Balance of last year, ..... | 911 | 15 | 11 |
|-----------------------------|-----|----|----|

14,732 1 7

Total Rs. 28,100 1 7

The whole of the outstanding *liabilities*, including the estimated cost of the Journal to the 31st December, and Rs. 1,348 10 3 due to Mr. Vos for the repairs and additions to the house, amount to Rs. 7,549 1 9, while our *dependencies* to credit amount to Rs. 10,398 2 4, of which at least Rs. 9,000 are certainly realizable within the ensuing year.

The Council regard this result as eminently satisfactory, especially with reference to the heavy expense (Rs. 2,348 10 3) incurred by the triennial repairs and the additions made to the buildings, and to the number of drawings with which the Journal has been embellished, and the scientific and literary contributions of our members illustrated; also with reference to the expense incurred in printing and editing 12 numbers of the Society's new Oriental periodical, the *Bibliotheca Indica*, of which 9 have already appeared. Nor should it be forgotten that this result has been arrived at in a year of unparalleled distress, which bore directly or indirectly most seriously upon the Society's resources.

#### ADDITIONS TO BUILDINGS.

The Council point with much pleasure to the great improvement effected in the premises by the enclosure of the south veranda, the erection of a sky-light over the hall of meeting, the furnishing of the apartments and the arrangements for the suitable lighting of the rooms

on the occasions of the evening meetings. The cost of the furniture it is gratifying to add, has been chiefly provided by the liberal donations of a few members of the Society, and has entailed only a charge of Rs. 336 on their general funds.

The financial crisis of 1848 rendered it impracticable to proceed with the plans for erecting a Sculpture Gallery and Lecture-Room, and for providing lectureships, as suggested in the Annual Report for 1847. Nor does the present period appear favorable for the introduction of these important measures, which the Council still hope are only postponed to more prosperous times.

#### ORIENTAL DEPARTMENT.

The marked feature in this department is the commencement of the "*Bibliotheca Indica*" on the plan suggested by the Vice President, Mr. Laidlay, and which has already elicited the approbation of Professor Wilson, M. Burnouf, and the leading philologists of Germany. Next in importance is the liberal remission on the part of the Hon'ble the Court of Directors of the heavy claims to which the Society had become liable for the misapplication of the Oriental Grant from 1841 to 1847.

#### NATURAL HISTORY. THE SECTIONS, &c.

In the Department of *Natural History*, the Council have to record their grateful sense of the indefatigable exertions of the *Section of Natural History*, who have met weekly in the Museum during the whole year, and under whose directions in a few months more the Council feel assured that the Zoological Museum will be arranged and displayed in a manner worthy of the scientific reputation of the Society, and of the munificent aid afforded by Government to this department of their labours. The Council record with much regret that notwithstanding the zealous exertions of the Section no Catalogue has been as yet provided of the Collections in this department.

On the subject of the Sections generally the Council are of opinion that their appointment has been attended with great advantage to the Society; they propose that the present members be re-elected for the ensuing year.

The *Library* has been enriched by the acquisition of 474 volumes, the Museum by numerous and very valuable additions since the last Annual Report.



The Council have lastly to point out that in consequence of the death of Sir J. P. Grant, and the departure from the Presidency of Mr. H. M. Elliot, there are two vacancies to be filled up in the Vice Presidents list. As Colonel Forbes, so many years a Vice President, is immediately expected to return to Calcutta, the Council propose his re-election. On the Council list—through the departure of Mr. Bushby, Mr. W. P. Grant, Lord Arthur Hay, and Mr. Heatley, and the resignation of Mr. Grey, five vacancies exist, but the Council consider that the original number of nine members should be reverted to, which if agreed to, will render necessary the election of two new members. The Council accordingly propose the following names for the consideration of the Society :—

*Dr. McClelland,*  
*Babu Ramgopal Ghose.*

The whole of the accounts and documents illustrative of the Society's affairs as reported on in the preceding details, are herewith submitted to the Society, and the Council propose that they be printed separately for circulation to the members.

With reference to the revision of rules adverted to in the last general report, the Council desire to add that replies have not as yet been received from the principal public bodies addressed on this subject.

The Council in conclusion desire to record their grateful sense of the important literary and scientific contributions received by the Society during the past year, from many of its members, among whom the following—

*Mr. B. H. Hodgson,*  
*Lieut. H. Strachey, and*  
*Capt. A. Cunningham,*

have been conspicuous for the number and value of their communications. The Society are also deeply indebted to the Hon'ble Mr. Thomason, Lieut.-Governor N. W. Provinces, and to Mr. H. M. Elliot, Secretary to the Government of India, for the numerous and important public documents placed at their disposal for publication in the Journal.

By resolution of the Council,

W. B. O'SHAUGHNESSY, *Secretary.*

*Asiatic Society, 10th January, 1849.*

The Report having been read and adopted, the meeting proceeded to elect officers for the ensuing year, and on scrutiny of the lists, the elections of the following gentlemen were announced :—

*President.*

THE HON'BLE SIR J. W. COLVILE.

*Vice Presidents.*

THE LORD BISHOP OF CALCUTTA.

LIEUT.-COL. W. N. FORBES.

J. W. LAIDLAY, ESQ.

DR. W. B. O'SHAUGHNESSY.

*Council.*

WELBY JACKSON, ESQ.

CAPT. A. BROOME.

R. W. G. FRITH, ESQ.

BABU RAMGOPAL GHOSE.

DR. H. WALKER.

W. SETON KARR, ESQ.

JAMES DODD, ESQ.

DR. MCCLELLAND,

and

REV. MR. LONG.

*Secretaries.*

W. B. O'SHAUGHNESSY, ESQ.

J. W. LAIDLAY, ESQ.

DR. E. ROER, *Secretary in the Oriental Department.*

The following gentlemen were also appointed members of the several Sections :—

*Oriental Section.*

W. SETON KARR, ESQ.

W. JACKSON, ESQ.

BABU HURREEMOHUN SEN.

BABU RAJENDRA LAL MITTRA.

REV. MR. LONG.

CAPT. LATTER.

DR. ROER, *Secretary.*

*Natural History.*

J. W. GRANT, ESQ.

DR. WALKER.

R. W. G. FRITH, ESQ.

DR. MCCLELLAND

MR. LAIDLAY, *Secretary.*

*Statistical.*

REV. MR. LONG. | DR. DUNCAN STEWART. | LIEUT. STAPLES.

*Geology and Mineralogy.*

CAPT. BROOME.

JAS. DODD, ESQ

G. WILBY, ESQ.

H. NEWMARCH, ESQ.

A. MITCHELL, ESQ.

*Physics and Meteorology.*

J. W. GRANT, ESQ.

CAPT. THUILLIER.

LIEUT.-COL. FORBES.

REV. MR. PRATT.

Dr.

*Abstract Statement of the Receipts and*

## RECEIPTS.

## To MUSEUM.

|                                                                                                                                                                         |     |       |   |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-------|---|-----------------|
| Received from the General Treasury the amount of allowance authorised by the Court of Directors for the services of a Curator for 12 months at 250 Rs. per month, ..... | Rs. | 3,000 | 0 | 0               |
| Ditto ditto for preparation of Specimens at 50 Rs. per month, .....                                                                                                     |     | 600   | 0 | 0               |
| Ditto back amount of Beni Frash's services for 5 months, his services not being required—at 5 Rs. per month, .....                                                      |     | 25    | 0 | 0               |
| Ditto fine from Frash's Salary, .....                                                                                                                                   |     | 0     | 8 | 0               |
|                                                                                                                                                                         |     |       |   | <hr/> 3,628 8 0 |

## To MUSEUM ECONOMIC GEOLOGY.

|                                                                                                                                                                  |  |       |   |                 |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|-------|---|-----------------|
| Received from the General Treasury the amount of allowance granted by Government for the services of a Joint Curator, for 12 months, at 250 Rs. per month, ..... |  | 3,000 | 0 | 0               |
| Ditto ditto for Establishment and contingencies, and ditto, at 64 Rs. per month, .....                                                                           |  | 768   | 0 | 0               |
|                                                                                                                                                                  |  |       |   | <hr/> 3,768 0 0 |

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Carried over,.. 7,393 8 0

*Disbursements of the Asiatic Society, for the year 1848.*

Cr.

## DISBURSEMENTS.

## BY MUSEUM.

|                                                                                                              |       |   |   |            |
|--------------------------------------------------------------------------------------------------------------|-------|---|---|------------|
| Paid Mr. E. Blyth's Salary as Curator<br>for 12 months, at 250 Rs. per month,                                | 3,000 | 0 | 0 |            |
| Ditto house-rent for ditto at 40 Rs. per<br>ditto, .....                                                     | 480   | 0 | 0 |            |
|                                                                                                              |       |   |   | 3,480 0 0  |
| Ditto Establishment of Taxidermists, Artists, Carpen-<br>ters, &c., ditto ditto at 147 Rs. per month, .....  | 1,764 | 0 | 0 |            |
| Ditto Contingencies, ditto ditto, .....                                                                      | 526   | 2 | 0 |            |
| Ditto for 5 dozens and 2 Stoppered Bottles, .....                                                            | 18    | 1 | 0 |            |
| Ditto for 1 tin-lined Case for packing Minerals for Syd-<br>ney Museum, .....                                | 3     | 1 | 6 |            |
| Ditto Mr. H. Mansel, for a Teak Wood<br>Glass Case for the Model of the Taj, .....                           | 40    | 0 | 0 |            |
| Ditto ditto for expences incurred in re-<br>placing the Missing pieces of Ivory,<br>&c. for the above, ..... | 16    | 0 | 0 |            |
|                                                                                                              |       |   |   | 56 0 0     |
| Ditto for repairing and enlarging a Teak Wood Table<br>for ditto, .....                                      | 12    | 0 | 0 |            |
| Ditto for a Glass Case for depositing Shells, .....                                                          | 70    | 7 | 6 |            |
|                                                                                                              |       |   |   | 5,929 12 0 |

## BY MUSEUM ECONOMIC GEOLOGY.

|                                                                                                |       |    |   |           |
|------------------------------------------------------------------------------------------------|-------|----|---|-----------|
| Paid Mr. H. Piddington's Salary as Joint-Curator for<br>12 months, at 250 Rs. per month, ..... | 3,000 | 0  | 0 |           |
| Ditto Establishment for ditto at 31 Rs. per ditto, ....                                        | 372   | 0  | 0 |           |
| Ditto Contingencies for ditto, .....                                                           | 89    | 13 | 6 |           |
| Ditto for a Copy of Lyall's Principles of Geology, ....                                        | 11    | 4  | 0 |           |
| Ditto for a Silver Evaporating Basin, .....                                                    | 28    | 8  | 0 |           |
| Ditto Messrs. Scott and Co. for a Copy of Bengal Di-<br>rectory for 1848, .....                | 8     | 0  | 0 |           |
| Ditto for a Copy of Quarterly Journal of Geological<br>Society, No. 12, .....                  | 4     | 0  | 0 |           |
| Ditto for 4 lbs. and 5oz. of liquor ammoniæ with stop-<br>pered bottles, .....                 | 18    | 0  | 0 |           |
|                                                                                                |       |    |   | 3,531 9 6 |

## BY MINERALOGICAL AND GEOLOGICAL MUSEUM.

|                                                                                          |       |    |   |          |
|------------------------------------------------------------------------------------------|-------|----|---|----------|
| Paid Contingencies for 12 months, .....                                                  | 65    | 10 | 0 |          |
| Ditto Mr. J. C. Sherriff, for printing Geological Cata-<br>logue in February 1841, ..... | 89    | 13 | 6 |          |
| Ditto ditto Mineralogical ditto, .....                                                   | 61    | 10 | 6 |          |
| Ditto for a Saw for cutting Specimens, .....                                             | 7     | 8  | 0 |          |
| Ditto for Teak planks for making a chest of drawers,..                                   | 13    | 4  | 6 |          |
|                                                                                          |       |    |   | 237 14 6 |
| Carried over,..                                                                          | 9,699 | 4  | 0 |          |

Brought forward, Co.'s Rs. 7,393 8 0

## BY LIBRARY.

|                                  |        |        |
|----------------------------------|--------|--------|
| Received by Sale of Books, ..... | 65 6 6 |        |
|                                  | <hr/>  | 65 6 6 |

## TO ORIENTAL PUBLICATIONS.

|                                                                                                                        |           |             |
|------------------------------------------------------------------------------------------------------------------------|-----------|-------------|
| Received from the General Treasury the amount of<br>grant from Government for 12 months, at 500 Rs.<br>per month,..... | 6,000 0 0 |             |
| Ditto by sale of Oriental Publications, ..                                                                             | 770 0 0   |             |
| Ditto (by transfer) from Mr. H. Torrens,<br>ditto, .....                                                               | 134 0 0   |             |
| Ditto ditto Mr. J. Muir, ditto, .....                                                                                  | 24 0 0    |             |
|                                                                                                                        | <hr/>     | 928 0 0     |
|                                                                                                                        | <hr/>     | 6,928 0 0   |
|                                                                                                                        |           | <hr/>       |
| Carried over, ..                                                                                                       |           | 14,386 14 6 |

Brought forward, Co.'s Rs. 9,699 4 0

## BY LIBRARY.

|                                                                                                                                                                                                                                                      |       |       |             |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|-------|-------------|
| Paid Baboo Rajenda Lall Mitter's Salary as Assistant Secretary and Librarian for 12 months, at 100 Rs. per month, .....                                                                                                                              | 1,200 | 0     | 0           |
| Ditto Establishment for Library, at 58 Rs. 8 An. ditto, .....                                                                                                                                                                                        | 702   | 0     | 0           |
| Ditto Contingencies for ditto, .....                                                                                                                                                                                                                 | 173   | 6     | 6           |
| Ditto Messrs. Thacker and Co., for purchase of Books, .....                                                                                                                                                                                          | 175   | 12    | 0           |
| Ditto Messrs. Ostell and Lepage, for ditto, .....                                                                                                                                                                                                    | 196   | 12    | 0           |
| Ditto Capt. C. Douglas, ditto, .....                                                                                                                                                                                                                 | 144   | 8     | 0           |
| Ditto Mr. J. S. Cunningham, agent of Messrs. Smith, Elder and Co., for ditto, .....                                                                                                                                                                  | 208   | 0     | 0           |
| Ditto Mr. J. Sinclair, Accountant Oriental Bank, for a set of Bills of exchange, No. 5 1215, on the Union Bank of London, in favor of Mr. H. C. Cumming, and remitted in payment of Books purchased from him—£25 10 0, exchange 1 8½ per Rupee, .... | 298   | 8     | 7           |
| Ditto Native Book-Sellers for ditto, ....                                                                                                                                                                                                            | 16    | 8     | 0           |
| Ditto Messrs. Scott and Co., for a Copy of Bengal Directory for the year 1848, .....                                                                                                                                                                 | 10    | 0     | 0           |
| Ditto for a Copy of Capt. Bedford's Chart of the Hooghly, below Calcutta, .....                                                                                                                                                                      | 2     | 0     | 0           |
| Ditto Mr. Edmond, for a Copy of the Distribution List of the B. C. Service, from 1st November, 1848, .....                                                                                                                                           | 1     | 0     | 0           |
|                                                                                                                                                                                                                                                      | <hr/> | 1,053 | 0 7         |
| Ditto Duftry for binding books, .....                                                                                                                                                                                                                | 251   | 6     | 0           |
| Ditto Messrs. Thacker and Co., for stationary, .....                                                                                                                                                                                                 | 36    | 12    | 0           |
| Ditto Landing charges on Books, parcels, &c., .....                                                                                                                                                                                                  | 5     | 12    | 0           |
| Ditto for making 14 new planks for, and repairing bookshelves, .....                                                                                                                                                                                 | 27    | 0     | 0           |
| Ditto for a Ratan Mat, .....                                                                                                                                                                                                                         | 26    | 10    | 0           |
| Ditto freight for a Case containing Asiatic Researches, forwarded to Dr. L. C. Stewart, Kussowlee, .....                                                                                                                                             | 2     | 13    | 0           |
| Ditto ditto Mahabharut ditto to Pundit Jawhirilal, Umbala, .....                                                                                                                                                                                     | 1     | 8     | 0           |
| Ditto ditto for 2 packages ditto to Capt. Mr. Kittoe, Benares, .....                                                                                                                                                                                 | 6     | 9     | 9           |
|                                                                                                                                                                                                                                                      | <hr/> | 10    | 14 9        |
|                                                                                                                                                                                                                                                      |       | <hr/> | 3,486 13 10 |

## BY ORIENTAL PUBLICATIONS.

|                                                                                                                  |     |    |   |
|------------------------------------------------------------------------------------------------------------------|-----|----|---|
| Paid Establishment for Oriental Works for 12 months, at 72 Rs. per month, .....                                  | 864 | 0  | 0 |
| Ditto Contingencies for ditto, ....                                                                              | 16  | 12 | 9 |
| Ditto Rev. J. Thomas, Printer, for 100 Copies of Mr. Hodgson's Essay on the Kooch, Bodo and Dhimal Tribes, ..... | 300 | 0  | 0 |
| Ditto Messrs. Thacker and Co., for a Copy of the Abesh Kedah, .....                                              | 3   | 4  | 0 |
| Ditto Duftry for binding books, .....                                                                            | 50  | 6  | 0 |

Carried over,.. 13,186 1 10

*Report.*

Brought forward, Co.'s Rs. 14,386 14 6

**To JOURNAL.**

|                                                            |       |    |   |            |
|------------------------------------------------------------|-------|----|---|------------|
| Received by sale of the Asiatic Society's Journal, . . . . | 291   | 12 | 0 |            |
| Received by transfer from the separate account of          |       |    |   |            |
| Journals sold to Subscribers, . . . . .                    | 1,673 | 0  | 0 |            |
|                                                            |       |    |   | <hr/>      |
|                                                            |       |    |   | 1,964 12 0 |

Carried over, . . 

---

16,351 10 6



Brought forward, Co.'s Rs. 13,186 1 10

|                                                                                                                                                                                                                                                   |       |   |   |           |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---|---|-----------|
| Ditto for transcribing 8400 Slokes of the<br>Rajah Tarangini, at 3 8 per 1000,....                                                                                                                                                                | 29    | 6 | 6 |           |
| Ditto ditto 24 jooz and 6 pages of the<br>Dartorruck Amar Bahdarashale, at 3<br>jooz per Rupee, .....                                                                                                                                             | 8     | 2 | 0 |           |
|                                                                                                                                                                                                                                                   |       |   |   | 37 8 6    |
| Ditto for eight wrought-iron bars for suspending book-<br>shelves, .....                                                                                                                                                                          | 23    | 9 | 3 |           |
| Ditto for a Ratan Mat, .....                                                                                                                                                                                                                      | 20    | 2 | 0 |           |
| Ditto for repairing book-shelves and supplying 112 feet<br>of Teak wood for the same, .....                                                                                                                                                       | 28    | 7 | 6 |           |
| Ditto Rev. J. Thomas, of Baptist Mission Press, for<br>printing Bibliotheca Indica, No. 1-4, .....                                                                                                                                                | 896   | 2 | 0 |           |
| Ditto ditto Dr. E. Roer's Salary as Editor of the Ori-<br>ental Journal for 11 months, at 100 Rs. per month, .....                                                                                                                                | 1,100 | 0 | 0 |           |
| Ditto ditto his Establishment for ditto, .....                                                                                                                                                                                                    | 474   | 0 | 0 |           |
| Ditto ditto boat hire for Pundits for ditto, .....                                                                                                                                                                                                | 48    | 0 | 0 |           |
| Ditto ditto Contingencies for ditto, .....                                                                                                                                                                                                        | 14    | 6 | 6 |           |
| Ditto Proprietors of Newspapers for advertizing Bib-<br>liotheca Indica, .....                                                                                                                                                                    | 37    | 8 | 0 |           |
| Ditto for a Bill Register-Book for ditto, .....                                                                                                                                                                                                   | 1     | 9 | 0 |           |
| Ditto Accountant to the Government of<br>Bengal, Revenue Department, for a draft<br>on the Collector of Benares in favour<br>of Mr. G. Nicholls, Head Master Be-<br>neras College, and remitted to him on<br>account Oriental publications, ..... | 51    | 0 | 0 |           |
| Less amount received from Dr. Roer, on<br>this account from Mr. Beadon, .....                                                                                                                                                                     | 11    | 8 | 0 |           |
|                                                                                                                                                                                                                                                   |       |   |   | 39 8 0    |
|                                                                                                                                                                                                                                                   |       |   |   | 3,955 3 6 |

## BY JOURNAL.

|                                                                                                                                         |        |    |    |           |
|-----------------------------------------------------------------------------------------------------------------------------------------|--------|----|----|-----------|
| Paid Rev. J. Thomas, account Baptist Mission Press,<br>for printing the Society's Journal, from July to<br>April, 1848, .....           | 2,852  | 0  | 0  |           |
| Ditto ditto for 2 Reams and 9 quires of thick tinted<br>colored paper, .....                                                            | 49     | 0  | 0  |           |
| Ditto Mr. T. Black, Proprietor of the Asiatic Litho-<br>graphic Press, for printing and lithographing Draw-<br>ings, Charts, &c., ..... | 707    | 9  | 10 |           |
| Ditto Mr. J. DeCruz, for the Proprietor<br>of the Calcutta Lithographic Press,<br>for Lithographing Maps, .....                         | 60     | 6  | 0  |           |
| Ditto Mr. T. F. Cummins, for Lithogra-<br>phing plates, .....                                                                           | 20     | 12 | 0  |           |
| Ditto Mahindy Lall Sircar, for Litho-<br>graphing plates, .....                                                                         | 47     | 8  | 0  |           |
|                                                                                                                                         |        |    |    | 836 3 10  |
| Ditto Bissonauth Nundon's Salary as Draftsman for<br>August and September, 1848, .....                                                  | 50     | 0  | 0  |           |
| Ditto for binding Journals, .....                                                                                                       | 10     | 8  | 0  |           |
| Ditto freight for Journals, forwarded to Messrs. W. H.<br>Allen and Co. London, per P. and O. S. N. Co.'s<br>Steamers, .....            | 123    | 8  | 0  |           |
| Ditto Contingencies and postage, .....                                                                                                  | 60     | 4  | 6  |           |
|                                                                                                                                         |        |    |    | 3,981 8 4 |
| Carried over, ..                                                                                                                        | 21,122 | 13 | 8  |           |



Brought forward, Co.'s Rs. 16,351 10 6

## TO CONTRIBUTIONS AND ADMISSION FEES.

|                                                                                      |       |    |   |            |
|--------------------------------------------------------------------------------------|-------|----|---|------------|
| Received from Members, amount of quarterly contributions during the 12 months, ..... | 9,386 | 15 | 2 |            |
| Ditto ditto admission fees ditto, .....                                              | 608   | 0  | 0 |            |
|                                                                                      |       |    |   | <hr/>      |
|                                                                                      |       |    |   | 9,994 15 2 |

## TO MISCELLANEOUS.

|                                                                                                                                    |    |   |   |        |
|------------------------------------------------------------------------------------------------------------------------------------|----|---|---|--------|
| Received by sale of Old Mats, .....                                                                                                | 8  | 8 | 0 |        |
| Received by transfer from Mr. J. Muir, the amount paid for printing 200 Copies of the Literature of the Vedas as per contra, ..... | 32 | 0 | 0 |        |
|                                                                                                                                    |    |   |   | <hr/>  |
|                                                                                                                                    |    |   |   | 40 8 0 |

## TO SECRETARY'S OFFICE.

|                                                                                                                  |   |   |   |       |
|------------------------------------------------------------------------------------------------------------------|---|---|---|-------|
| Received from Buckawoolla Peon, 1st instalment in payment of Rs. 10 advanced him on account of his Salary, ..... | 1 | 0 | 0 |       |
|                                                                                                                  |   |   |   | <hr/> |
|                                                                                                                  |   |   |   | 1 0 0 |

## TO CONTRIBUTIONS FOR THE PURCHASE OF FURNITURE.

Received from the following Members contributions for the purchase of the Asiatic Society's Furniture :—

|                                 |     |     |   |   |         |
|---------------------------------|-----|-----|---|---|---------|
| J. W. Colville, Esq. ....       | Rs. | 100 | 0 | 0 |         |
| J. W. Grant, Esq. ....          |     | 100 | 0 | 0 |         |
| Messrs. Willis and Earle, ..... |     | 50  | 0 | 0 |         |
| J. W. Laidlay, Esq. ....        |     | 50  | 0 | 0 |         |
| G. Lamb, Esq. ....              |     | 50  | 0 | 0 |         |
| H. M. Elliot, Esq. ....         |     | 50  | 0 | 0 |         |
| Rajah Ramchund Sing, .....      |     | 200 | 0 | 0 |         |
| Rajah Sutchurn Ghosaul, .....   |     | 50  | 0 | 0 |         |
| W. B. Jackson, Esq. ....        |     | 50  | 0 | 0 |         |
| Baboo Ramgopaul Ghose, .....    |     | 50  | 0 | 0 |         |
| E. Currie, Esq. ....            |     | 50  | 0 | 0 |         |
|                                 |     |     |   |   | <hr/>   |
|                                 |     |     |   |   | 800 0 0 |

Carried over,.. 27,188 1 8

Brought forward, Co.'s Rs. 21,122 13 8

## BY MISCELLANEOUS.

|                                                                                                                                        |     |    |   |                 |
|----------------------------------------------------------------------------------------------------------------------------------------|-----|----|---|-----------------|
| Paid Mr. H. Halligan's Salary as Night Guard for 12 months, at 40 Rs. per month, .....                                                 | 480 | 0  | 0 |                 |
| Ditto for repairing the Table for the Meeting Room,..                                                                                  | 10  | 3  | 0 |                 |
| Ditto for repairing and bronzing 14 wall shade branches, and supplying 14 new Toon Wood Brackets, .....                                | 14  | 0  | 0 |                 |
| Ditto for advertizing Meetings of the Asiatic Society in the Newspapers, .....                                                         | 114 | 4  | 9 |                 |
| Ditto Messrs. Spence and Co., for lighting up the Town Hall for the Meeting of May, June, July, and August 1848, at 32 Rs. each, ..... | 128 | 0  | 0 |                 |
| Ditto for Sundry Contingent expences incurred for the Meetings, and for Oil for Night Guard, .....                                     | 100 | 1  | 9 |                 |
| Ditto Nyak bearer's Salary, as bearer for the reading room from 12th September to 30th October, 1848, at 6 Rs. per month, . . . . .    | 9   | 12 | 9 |                 |
| Ditto Mr. J. Chaunce, for winding up and keeping the Clock in order, .....                                                             | 25  | 0  | 0 |                 |
| Ditto Rev. J. Thomas, account Baptist Mission Press, for printing Miscellaneous Articles,.....                                         | 207 | 4  | 0 |                 |
| Ditto ditto on account Mr. J. Muir, for printing 200 Copies of the Literature of the Vedas,.....                                       | 32  | 0  | 0 |                 |
| Ditto Mr. T. Black, Proprietor of the Asiatic Lithographic Press, for Lithographing 100 Copies of election letter, .....               | 6   | 8  | 0 |                 |
| Ditto ditto, for printing from a steel Engraving emblematic Vignette of the Museum of the Society, .....                               | 6   | 0  | 0 | 12 8 0          |
| Ditto (by transfer) on account of Mr. H. Torrens, in part of Rupees 1500 due to him by the Society,....                                | 502 | 0  | 0 |                 |
| Ditto ditto Mr. J. Muir, Ditto Rs. 500 ditto, .....                                                                                    | 163 | 0  | 0 |                 |
|                                                                                                                                        |     |    |   | <hr/> 1,803 2 3 |

## BY SECRETARY'S OFFICE.

|                                                                                                 |     |    |   |                 |
|-------------------------------------------------------------------------------------------------|-----|----|---|-----------------|
| Paid Mr. F. Greenway's Salary as officiating Accountant for 12 months at 60 Rs. per month,..... | 720 | 0  | 0 |                 |
| Ditto Establishment for Ditto at 41 Rs. per ditto, ..                                           |     |    |   |                 |
| Co. Rs. 492 0 0                                                                                 |     |    |   |                 |
| Less Salary of Peons, whose services were not entertained,.....                                 | 3   | 0  | 3 | 488 15 9        |
| Ditto for Stationary,.....                                                                      | 86  | 6  | 0 |                 |
| Ditto Contingencies and Postage, .....                                                          | 61  | 12 | 6 |                 |
| Ditto Bucka woolla Peon, advance on account of his salary,.....                                 | 10  | 0  | 0 |                 |
|                                                                                                 |     |    |   | <hr/> 1,367 2 3 |

## BY PURCHASE OF FURNITURE.

Paid Messrs. Adam and Co. for purchase of the following articles :—

|                                                          |     |   |   |
|----------------------------------------------------------|-----|---|---|
| 1 Mahogany Marble-top Circular Drawing Room Table, ..... | 220 | 0 | 0 |
| 2 pairs or 4-Light Lusters at 120, ..                    | 480 | 0 | 0 |
| 1 pair of treble-branch wall Gerandols,                  | 70  | 0 | 0 |
| 1 Mirzapoor Carpet, 23 feet by 16 feet,                  | 125 | 0 | 0 |
| 1 Bronze Standish, .....                                 | 28  | 0 | 0 |

Carried over,.. 24,293 2 2

Brought forward, Co.'s Rs. 27,188    1    8

**TO BALANCE.**

As per Account closed on the 31st Dec. 1848, .....    911   15   11

Company's Rupees,.... 28,100    1    7

Errors and

*Calcutta, Asiatic Society, }  
the 30th Dec. 1848.    }*

|                                                     |                                   |   |   |       |           |
|-----------------------------------------------------|-----------------------------------|---|---|-------|-----------|
|                                                     | Brought forward, Co.'s Rs. 24,293 |   |   | 2     | 2         |
| 1 Mahogany Camp Sideboard in 3 parts, .....         | 110                               | 0 | 0 |       |           |
| 2 Pairs of Bronzed Table Argand Lamps, .....        | 100                               | 0 | 0 |       |           |
| 1 Gross Cotton Wicks, .....                         | 3                                 | 0 | 0 |       |           |
|                                                     | <hr/>                             |   |   | 1,136 | 0 0       |
| Ditto Muddoo Soodun Doss, for 3 Argand Lamps, ..... | 25                                | 0 | 0 |       |           |
| 2 Dozens Oilburners, .....                          | 10                                | 0 | 0 |       |           |
| 2 Glass Tumblers, .....                             | 1                                 | 0 | 0 |       |           |
|                                                     | <hr/>                             |   |   | 36    | 0 0       |
| Ditto for 11 pieces of Beerbhoom cloth, .....       |                                   |   |   | 16    | 8 0       |
| Ditto for Rattan Mats, .....                        |                                   |   |   | 442   | 1 0       |
|                                                     | <hr/>                             |   |   |       | 1,630 9 0 |

## BY BUILDINGS.

|                                                                                                    |       |   |   |       |     |
|----------------------------------------------------------------------------------------------------|-------|---|---|-------|-----|
| Paid Mr. J. M. Vos, advance on account of repairs and alterations of the Society's Premises, ..... | 1,000 | 0 | 0 |       |     |
|                                                                                                    | <hr/> |   |   | 1,000 | 0 0 |

## BY SIR WM. JONES' MONUMENT.

|                                                                                            |       |   |   |     |     |
|--------------------------------------------------------------------------------------------|-------|---|---|-----|-----|
| Paid Messrs. Sheriff and Co. for repairing Sir Wm. Jones' Monument, as per estimate, ..... | 103   | 7 | 9 |     |     |
|                                                                                            | <hr/> |   |   | 103 | 7 9 |

## BY BALANCE.

|                              |       |   |   |     |      |
|------------------------------|-------|---|---|-----|------|
| In the Bank of Bengal, ..... | 955   | 7 | 6 |     |      |
| Cash in hand, .....          | 37    | 7 | 2 |     |      |
|                              | <hr/> |   |   | 992 | 14 8 |

## BY INEFFICIENT BALANCE.

|                                                                                                                     |       |   |   |                     |            |
|---------------------------------------------------------------------------------------------------------------------|-------|---|---|---------------------|------------|
| For amount advanced Mr. Templeton, for Contingencies in the Museum and Zoology Department on the 27th ultimo, ..... | 50    | 0 | 0 |                     |            |
| Ditto Baboo Rajendralall Mittro, Assistant Secretary and Librarian, ditto in the Library, on the 3rd ultimo, .....  | 30    | 0 | 0 |                     |            |
|                                                                                                                     | <hr/> |   |   | 80                  | 0 0        |
|                                                                                                                     | <hr/> |   |   |                     | 1,072 14 8 |
|                                                                                                                     | <hr/> |   |   | Company's Rupee, .. | 28,100 1 7 |

Omissions Excepted.

FRED GREENWAY,  
*Officiating Accountant.*

Dr.

*The Oriental Publication Grant in*

|                                                                                                                                                                                          |  |  |  |     |    |   |          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|-----|----|---|----------|
| January 11th, 1848.—To Cash paid Dr. E. Roer, Co-Secretary, Oriental Department, Establishment and Contingencies for the month of Dec. 1847, for the publication of the Vedas, ..... Rs. |  |  |  | 44  | 0  | 0 |          |
| Ditto 15th, ditto, Establishment for Oriental Works,                                                                                                                                     |  |  |  | 72  | 0  | 0 |          |
| Ditto 20th, ditto, Duftry for binding Oriental Books, presented to Pope Pius IX.,.....                                                                                                   |  |  |  | 24  | 12 | 0 |          |
| Ditto ditto ditto ditto, .....                                                                                                                                                           |  |  |  | 12  | 12 | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 153 8 0  |
| February 8th ditto, Dr. E. Roer, Editor of the Oriental Journal "Bibliotheca Indica," his allowance for the month of Jan. 1848, .....                                                    |  |  |  | 100 | 0  | 0 |          |
| Ditto ditto Establishment and Contingencies for ditto,                                                                                                                                   |  |  |  | 29  | 2  | 0 |          |
| Ditto 17th ditto, Establishment for Oriental Works for Jan. 1848, .....                                                                                                                  |  |  |  | 72  | 0  | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 201 2 0  |
| March 6th ditto, Duftry for binding the following works :—                                                                                                                               |  |  |  |     |    |   |          |
| A Copy of Amarcosha, .....                                                                                                                                                               |  |  |  | 1   | 6  | 0 |          |
| A Copy of Persian Catalogue, .....                                                                                                                                                       |  |  |  | 0   | 12 | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 2 2 0    |
| Ditto 7th ditto, Dr. E. Roer, Co-Secretary Asiatic Society, his allowance as Editor of the "Bibliotheca Indica" for Feb.,                                                                |  |  |  | 100 | 0  | 0 |          |
| Ditto Establishment and Contingencies,                                                                                                                                                   |  |  |  | 24  | 0  | 0 |          |
| Ditto Charges for Advertizing the 1st No. of the Bibliotheca Indica in the Bengalee Newspapers, .....                                                                                    |  |  |  | 11  | 8  | 0 |          |
| Ditto ditto ditto in the "Englishman,"                                                                                                                                                   |  |  |  | 8   | 8  | 0 |          |
| Ditto ditto ditto in the Bengal Hurkaru,                                                                                                                                                 |  |  |  | 6   | 0  | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 150 0 0  |
| Ditto 16th ditto, Establishment for Oriental Works for February 1848, ....                                                                                                               |  |  |  | 72  | 0  | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 72 0 0   |
| Ditto 17th ditto, Sundry petty Charges,                                                                                                                                                  |  |  |  | 10  | 0  | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 10 0 0   |
| Ditto 29th ditto, Messrs. W. Thacker and Co. for a Copy of the Abesh Kedah, .....                                                                                                        |  |  |  | 3   | 4  | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 228 0 0  |
| April 5th ditto, Dr. E. Roer, Editor of the Oriental Journal for March 1848,                                                                                                             |  |  |  | 100 | 0  | 0 |          |
| Ditto ditto his Establishment and Contingencies for March,.....                                                                                                                          |  |  |  | 46  | 0  | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 146 0 0  |
| Ditto 6th ditto, petty Charges, .....                                                                                                                                                    |  |  |  | 0   | 4  | 0 |          |
| Ditto 15th ditto, Establishment for Oriental Works for March 1848, .....                                                                                                                 |  |  |  | 72  | 0  | 0 |          |
| Ditto 29th ditto, for a Blank Book, .....                                                                                                                                                |  |  |  | 1   | 9  | 0 |          |
|                                                                                                                                                                                          |  |  |  |     |    |   | 219 13 0 |
| Carried over,..                                                                                                                                                                          |  |  |  |     |    |   | 802 7 0  |

*Account Current with the Asiatic Society*

Cr.

|                                                                                                                                                                               |       |   |   |       |           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|---|---|-------|-----------|
| Jan. 1st, 1848.—By Balance of Account closed and published down to the 31st Dec. Company's 5 per cent. Loans of 1841—'42, .....                                               | 4,000 | 0 | 0 |       |           |
| Cash, .....                                                                                                                                                                   | 202   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   | 4,202 | 0 0       |
|                                                                                                                                                                               |       |   |   |       | 4,202 0 0 |
| Ditto 15th ditto Cash, received from the General Treasury, the Amount of Monthly grant sanctioned by the Court of Directors for the Month of December 1847, .....             | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| February 15th ditto, ditto for January 1848, .....                                                                                                                            | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| March 16th ditto, ditto for February 1848, .....                                                                                                                              | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| April 18th ditto, ditto for March 1848, .....                                                                                                                                 | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| May 25th, 1848.—By Cash received from the General Treasury, being the Amount of Monthly grant sanctioned by the Court of Directors for the Month of April 1848, .....         | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| June 28th, By ditto ditto for May 1848, .....                                                                                                                                 | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| July 18th, By ditto ditto for June 1848, .....                                                                                                                                | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| August 25th, 1848.—By Cash received from the General Treasury, being the Amount of Monthly grant sanctioned by the Court of Directors for the Month of July 1848, .....       | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| September 22nd ditto, ditto ditto for August 1848, ....                                                                                                                       | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| October 20th ditto, ditto ditto for September 1848, ..                                                                                                                        | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| November 17th ditto, ditto ditto for October 1848, ....                                                                                                                       | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |
| December 26th, 1848.—By Cash received from the General Treasury, being the Amount of Monthly grant sanctioned by the Court of Directors for the Month of November 1848, ..... | 500   | 0 | 0 |       |           |
|                                                                                                                                                                               |       |   |   |       | 500 0 0   |

Carried over,.. 10,202 0 0

|                                                                                                                                                                                                                                                      |     |    |                  |       |    |   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|----|------------------|-------|----|---|
|                                                                                                                                                                                                                                                      |     |    | Brought forward, | 802   | 7  | 0 |
| May 8th—To Cash paid Dr. E. Roer,<br>Editor of the Oriental Journal, his allow-<br>ance for April, 1848, .....                                                                                                                                       | 100 | 0  | 0                |       |    |   |
| Ditto ditto Establishment and Contin-<br>gencies ditto, .....                                                                                                                                                                                        | 48  | 0  | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 148   | 0  | 0 |
| Ditto 16th ditto, Establishment for Oriental Works for<br>April 1848, .....                                                                                                                                                                          | 72  | 0  | 0                |       |    |   |
| Ditto 17th ditto, Duftry for binding Books, .....                                                                                                                                                                                                    | 6   | 0  |                  |       |    |   |
| Ditto 22nd ditto, Extra Writer for transcribing 2000<br>Slokes of Rajatarangini at 3 8 per thousand, .....                                                                                                                                           | 7   | 0  | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 227   | 6  | 0 |
| June 3rd ditto, Dr. E. Roer, Editor<br>of the Oriental Journal, his Allowance<br>for May, .....                                                                                                                                                      | 100 | 0  | 0                |       |    |   |
| Ditto ditto his Establishment and Contin-<br>gencies for ditto, .....                                                                                                                                                                                | 41  | 1  | 6                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 146   | 1  | 6 |
| Ditto 13th ditto for, Ink for Copying Rajatarangini, ..                                                                                                                                                                                              | 0   | 8  | 0                |       |    |   |
| Ditto 17th, ditto Establishment for Oriental Works for<br>May 1848, .....                                                                                                                                                                            | 72  | 0  | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 218   | 9  | 6 |
| July 1st ditto, paid Cooly hire for Biblio-<br>theca Indica No. 4, .....                                                                                                                                                                             | 0   | 4  | 0                |       |    |   |
| Ditto ditto Gour Churn Doss for Copying<br>2500 Slokes of the Rajatarangini at<br>3-8 per thousand, .....                                                                                                                                            | 8   | 12 | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 9     | 0  | 0 |
| Ditto 7th ditto, Dr. E. Roer, Editor of<br>the Oriental Journal, his Allowance for<br>June 1848, .....                                                                                                                                               | 100 | 0  | 0                |       |    |   |
| Ditto ditto Establishment and Contingen-<br>cies for June 1848, .....                                                                                                                                                                                | 44  | 15 | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 144   | 15 | 0 |
| Ditto 15th ditto, Establishment for Oriental Works for<br>ditto, .....                                                                                                                                                                               | 72  | 0  | 0                |       |    |   |
| Ditto 24th ditto, Hoornaratullah for transcribing 24 jooz<br>and 6 pages of the Dartoorur Amar Bahadurashali, at<br>3 jooz per rupee, .....                                                                                                          | 8   | 2  | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 234   | 1  | 0 |
| August 2nd ditto, Dr. E. Roer, Editor of<br>the Oriental Journal, his Allowance for<br>July 1848, .....                                                                                                                                              | 100 | 0  | 0                |       |    |   |
| Ditto ditto ditto Establishment and Con-<br>tingencies for ditto, .....                                                                                                                                                                              | 50  | 8  | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            | 150   | 8  | 0 |
| Ditto 5th ditto, Accountant to the Government of Ben-<br>gal in the Revenue Department, for a Draft on the<br>Collector of Benares, and remitted to G. Nicholls,<br>Esq., Head Master of Benares, College, on a publi-<br>cation of the Vedas, ..... | 39  | 8  | 0                |       |    |   |
| Ditto 15th ditto, Sundry Contingent expences as per<br>Bill, .....                                                                                                                                                                                   | 3   | 11 | 0                |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | <hr/>            |       |    |   |
|                                                                                                                                                                                                                                                      |     |    | Carried over, .. | 1,482 | 7  | 6 |



*Report.*

xix

Brought forward, 10,202 0 0

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Carried over,.. 10,202 0 0



|                                                         |                 |     |    |                  |       |    |   |
|---------------------------------------------------------|-----------------|-----|----|------------------|-------|----|---|
|                                                         |                 |     |    | Brought forward, | 1,482 | 7  | 0 |
| August 15th, 1848.—To Cash paid for Copying 2900        |                 |     |    |                  |       |    |   |
| Slokes of the Rajatarangini at 3 8 per thousand, ..     | 10              | 2   | 6  |                  |       |    |   |
| Ditto 17th ditto, Establishment for Oriental Works for  |                 |     |    |                  |       |    |   |
| July 1848, .....                                        | 72              | 0   | 0  |                  |       |    |   |
|                                                         |                 |     |    |                  | 275   | 13 | 6 |
| September 4th ditto, Dr. E. Roer, Edi-                  |                 |     |    |                  |       |    |   |
| tor of the Oriental Journal, his salary                 |                 |     |    |                  |       |    |   |
| for August, .....                                       | 100             | 0   | 0  |                  |       |    |   |
| Ditto ditto Establishment for ditto,....                | 48              | 0   | 0  |                  |       |    |   |
| Ditto ditto Contingencies, 4 + 1 13 0                   | 5               | 13  | 0  |                  |       |    |   |
|                                                         |                 |     |    | 153              | 13    | 0  |   |
| Ditto 15th ditto, Contingencies for the Oriental De-    |                 |     |    |                  |       |    |   |
| partment of the Librarian, .....                        | 4               | 10  | 0  |                  |       |    |   |
| Ditto ditto for Copying 1000 Slokes of the Rajataran-   |                 |     |    |                  |       |    |   |
| gini as per bill, .....                                 | 3               | 8   | 0  |                  |       |    |   |
| Ditto 20th ditto, Duftry for binding Oriental Works,    | 10              | 12  | 0  |                  |       |    |   |
| Ditto 21st ditto, Establishment for Oriental Works for  |                 |     |    |                  |       |    |   |
| August, .....                                           | 72              | 0   | 0  |                  |       |    |   |
| Ditto 25th ditto, for 8 wrought-iron bars for suspend-  |                 |     |    |                  |       |    |   |
| ing Book-shelves, .....                                 | 23              | 9   | 3  |                  |       |    |   |
| Ditto 29th ditto Dr. E. Roer's salary as                |                 |     |    |                  |       |    |   |
| Editor of the Oriental Journal for                      |                 |     |    |                  |       |    |   |
| September, .....                                        | 100             | 0   | 0  |                  |       |    |   |
| Ditto ditto ditto his Establishment ditto,              | 48              | 0   | 0  |                  |       |    |   |
| Ditto ditto ditto Contingencies, ditto, ..              | 4               | 0   | 0  |                  |       |    |   |
|                                                         |                 |     |    | 152              | 0     | 0  |   |
| Ditto 30th ditto, for repairing Book-shelves, .....     | 2               | 4   | 0  |                  |       |    |   |
|                                                         |                 |     |    |                  | 422   | 8  | 3 |
| October 18th ditto, Establishment for Oriental Works    |                 |     |    |                  |       |    |   |
| for September 1848, .....                               | 72              | 0   | 0  |                  |       |    |   |
| Ditto 19th ditto, Cooley hire for remov-                |                 |     |    |                  |       |    |   |
| ing and arranging Book-shelves, ....                    | 3               | 12  | 0  |                  |       |    |   |
| Ditto ditto for a mat, .....                            | 20              | 2   | 0  |                  |       |    |   |
|                                                         |                 |     |    | 23               | 14    | 0  |   |
|                                                         |                 |     |    |                  | 95    | 14 | 0 |
| November 2nd ditto, Dr. E. Roer's                       |                 |     |    |                  |       |    |   |
| salary as Editor of the Oriental Jour-                  |                 |     |    |                  |       |    |   |
| nal for October 1848, .....                             | 100             | 0   | 0  |                  |       |    |   |
| Ditto ditto Establishment for ditto,....                | 48              | 0   | 0  |                  |       |    |   |
| Ditto ditto Contingencies 4 + 2 14 0                    | 6               | 14  | 0  |                  |       |    |   |
|                                                         |                 |     |    | 154              | 14    | 0  |   |
| Ditto 13th ditto ditto, ditto for the Oriental Depart-  |                 |     |    |                  |       |    |   |
| ment of the Library, .....                              | 1               | 11  | 9  |                  |       |    |   |
| Ditto 16th ditto, Establishment for Oriental Works for  |                 |     |    |                  |       |    |   |
| October, .....                                          | 72              | 0   | 0  |                  |       |    |   |
|                                                         |                 |     |    |                  | 228   | 9  | 9 |
| December 5th 1848.—To Cash paid Dr.                     |                 |     |    |                  |       |    |   |
| E. Roer's salary as Editor of the                       |                 |     |    |                  |       |    |   |
| Oriental Journal for November 1848,                     | 100             | 0   | 0  |                  |       |    |   |
| Ditto ditto Establishment for ditto,....                | 48              | 0   | 0  |                  |       |    |   |
| Ditto ditto Contingencies for ditto,....                | 5               | 5   | 0  |                  |       |    |   |
|                                                         |                 |     |    | 153              | 5     | 0  |   |
| Ditto 7th ditto, for repairing Book-shelves and supply- |                 |     |    |                  |       |    |   |
| ing 112 square feet of Teak board, &c. ....             | 28              | 7   | 6  |                  |       |    |   |
|                                                         |                 |     |    |                  |       |    |   |
|                                                         | Carried over,.. | 181 | 12 | 6                | 2,505 | 5  | 0 |

Brought forward, 10.202 0 0

Carried over, .. 10,202 0 0

|                                                                                                                           |                       |     |    |       |        |       |            |
|---------------------------------------------------------------------------------------------------------------------------|-----------------------|-----|----|-------|--------|-------|------------|
|                                                                                                                           | Brought forward,      | 181 | 12 | 6     | 2,505  | 5     | 0          |
| Ditto 20th ditto, Establishment of Oriental Works for November 1848, .....                                                |                       | 72  | 0  | 0     |        |       |            |
| Ditto 26th ditto, Rev. Mr. J. Thomas, account Baptist Mission Press for printing the Bibliotheca Indica No. 1 to 4, ..... | 796                   | 2   | 0  |       |        |       |            |
| Ditto ditto ditto English translation of the Text in the above 4 Nos.,.....                                               | 100                   | 0   | 0  |       |        |       |            |
| Ditto ditto for 100 Copies of Essay the first, on the Kooch, Bodo, and Dhimal Tribes, at 3 per copy,.....                 | 300                   | 0   | 0  |       |        |       |            |
|                                                                                                                           |                       |     |    | 1,196 | 2      | 0     |            |
|                                                                                                                           |                       |     |    |       |        |       | 1,449 14 6 |
| Ditto 30th ditto, Amount of Rev. J. Thomas's bill due for printing the "Bibliotheca Indica" No. 5 to 8, .....             |                       | 870 | 8  | 0     |        |       |            |
|                                                                                                                           |                       |     |    |       |        |       | 870 8 0    |
| Dec. 26th, 1846.—To Balance.                                                                                              |                       |     |    |       |        |       |            |
| Company's Papers of the new 5 per Cent. Loan deposited with the Government Agent, .....                                   | 4,000                 | 0   | 0  |       |        |       |            |
| Cash, .....                                                                                                               | 1,376                 | 4   | 6  |       |        |       |            |
|                                                                                                                           |                       |     |    |       |        | 5,376 | 4 6        |
|                                                                                                                           |                       |     |    |       |        |       |            |
|                                                                                                                           | Company's Rupees,.... |     |    |       | 10,202 | 0     | 0          |

Errors

*Calcutta, Asiatic Society, }*  
*the 30th Dec. 1848. }*

Brought forward, 10,202 0 0

Company's Rupees, 10,202 0 0

Excepted.

FRED. GREENWAY,  
*Officiating Accountant.*

Dr. *Abstract Statement of Account Current of Journal Asiatic Society, for the year 1847 and 1848.* Cr.

RECEIPTS.

|                                                                      |       |   |   |
|----------------------------------------------------------------------|-------|---|---|
| 7.—To Amount of Collections from Subscribers during this year, ..... | 587   | 0 | 0 |
| 48.—To ditto ditto, .....                                            | 1,586 | 0 | 0 |
|                                                                      | <hr/> |   |   |
|                                                                      | 2,173 | 0 | 0 |
| To Balance of Account Current closed in 1846, .....                  | 402   | 0 | 4 |

DISBURSEMENTS.

|                                                                                                                         |     |   |   |
|-------------------------------------------------------------------------------------------------------------------------|-----|---|---|
| 1847.—By amount paid Mr. J. C. Sheriff at Bishop's College Press, for printing Journals for March and April 1846, ..... | 496 | 0 | 0 |
| By ditto Mr. T. Black for Lithographing drawings, .....                                                                 | 80  | 4 | 0 |
| By amount paid to the Secretary Asiatic Society on account general Fund, .....                                          | 400 | 0 | 0 |

|                                             |       |       |   |   |
|---------------------------------------------|-------|-------|---|---|
|                                             | <hr/> | 976   | 4 | 0 |
| 1848.—By ditto ditto during the year, ..... |       | 1,673 | 0 | 0 |

By Balance in the Bank of Bengal, .....

|  |       |    |   |
|--|-------|----|---|
|  | 2,649 | 4  | 0 |
|  | 5     | 12 | 4 |

Company's Rupees,.... 2,655 0 4

Company's Rupees,.... 2,655 0 4

Errors and Omissions Excepted,

FRED. GREENWAY,

*Officiating Accountant.*

*Calcutta, Asiatic Society,  
the 26th December, 1848.* }

*Report.*

*Dependencies in favor of the Society.*

|                                                         |            |
|---------------------------------------------------------|------------|
| Amount of Bills outstanding from the                    |            |
| Members down to 3rd Qr. of 1848,                        |            |
| as per List, .....                                      | 4,564 13 8 |
| Ditto ditto for the whole of 4th Qr.                    |            |
| 1848, due on the 1st Jan. 1849,                         |            |
| 159 Members at 16 Rupees per Qr.                        | 2,544 0 0  |
| Amount of Bills due, and outstandings on account        | 7,108 13 8 |
| Journal on the 1st January, 1849,.....                  | 2,201 8 0  |
|                                                         | <hr/>      |
|                                                         | 9,310 5 8  |
| Balance in the hands of London Agents, Messrs.          |            |
| W. H. Allen and Co. per Account Current, dated          |            |
| 30th June, 1848, £32 4 7 @ 2s.....                      | 322 4 8    |
| Amount of Bills outstanding, account <i>Bibliotheca</i> |            |
| <i>Indica</i> , .....                                   | 62 0 0     |
| Amount of Bills outstanding on account Sale of Books    |            |
| in the Library, .....                                   | 703 8 0    |
|                                                         | <hr/>      |
| Company's Rupees,....                                   | 10,398 2 4 |

E. E.

FRED. GREENWAY,

Officiating Accountant.

*Asiatic Society, the 30th December, 1848.**Demands against the Society.*

|                                                    |            |
|----------------------------------------------------|------------|
| Amount due to the Rev. J. Thomas, for Printing and |            |
| Publishing, .....                                  | 3,054 4 0  |
| Amount due to the Oriental Fund,.....              | 1,376 6 6  |
| Amount due to Mr. Torrens, .....                   | 998 0 0    |
| Amount due to Mr. Muir, .....                      | 332 0 0    |
| Amount due to Mr. Vos, for repairing the Society's |            |
| Premises, .....                                    | 1,348 10 3 |
|                                                    | <hr/>      |
| Company's Rupees.....                              | 7,109 4 9  |

LIST OF MEMBERS  
OF THE  
ASIATIC SOCIETY OF BENGAL.

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- |                                   |                                  |
|-----------------------------------|----------------------------------|
| Anderson, Major W.                | Douglas, Capt. C.                |
| Avdall, J. Esq.                   | Dwarkanath Das Basu, Babu.       |
| Abbott, Capt. Jas.                | Dalton, Lieut. Ed. 9th Rt. N. I. |
| Alexander, Henry R. Esq.          | Earle, W. Esq.                   |
| Austen, Lieut. Albert G.          | Elliot, W. Esq. (M. C. S.)       |
| Barlow, Sir R.                    | Edgworth, M. P. Esq.             |
| Benson, Lieut. Col. R.            | Elliot, H. M. Esq.               |
| Beaufort, F. L. Esq.              | Elliot, J. B. Esq.               |
| Birch, Major F. W.                | Furlong, J. Esq.                 |
| Birch, Lieut. Col. R. J. H.       | Frith, W. H. L. Esq.             |
| Blagrove, Lieut. T. C.            | Frith, R. G. W. Esq.             |
| Bogle, Major A.                   | French, Gilson R. Esq.           |
| Bowring, L. R. Esq.               | Falconer, Dr. H.                 |
| Briggs, Lieut. D.                 | Forbes, Lt. Col. W. N.           |
| Broome, Capt. A.                  | Gilmore, A. Esq.                 |
| Buckland, C. T. Esq.              | Gladstone, M. Esq.               |
| Bushby, G. A. Esq.                | Grant, J. W. Esq.                |
| Batten, J. H. Esq.                | Grey, W. Esq.                    |
| Brodie, Capt. Thos. 5th Rt. N. I. | Gibelin, M. E.                   |
| Beckwith, J. Esq.                 | Greenway, Wm. Esq.               |
| Bell, Dr. Adam.                   | Gubbins, C. Esq.                 |
| Blundell, G. Esq.                 | Gobinda Chunder Sen, Babu.       |
| Banks, Capt. J. S.                | Hannay, Capt. S. T.              |
| Campbell, A. Esq.                 | Heatly, S. G. T. Esq.            |
| Cheap, G. C. Esq.                 | Henry, Dr. Wm.                   |
| Christopher, A. Esq.              | Hill, G. Esq.                    |
| Colvin, B. J. Esq.                | Hough, H. F. Esq. Ph. Gl.        |
| Colvin, J. R. Esq.                | Hodgson, B. H. Esq.              |
| Corbyn, F. Esq.                   | Hæberlin, Dr. J.                 |
| Colville, The Hon'ble Sir J. W.   | Hopkinson, Capt. H.              |
| Cust, R. N. Esq.                  | Houston, R. Esq.                 |
| Currie, E. Esq.                   | Huffnagle, C. (M. D.) Esq.       |
| Cunningham, Capt. J. D.           | Hurimohun Sen, Babu.             |
| Corcoran, Jas. Esq.               | Hannington, Capt. J. C.          |
| Champneys, Capt. E. G. J.         | Hall, F. E. Esq.                 |
| Colebrooke, R. Esq.               | Hamilton,—Esq.                   |
| Davidson, T. R. Esq.              | Hay, Andrew, Esq.                |
| Dunlop, A. C. Esq.                | Hearsey, Lieut. Col. W.          |
| Dodd, Jas. Esq.                   | Jackson, W. B. Esq.              |
| Dirom, W. M. Esq.                 | Jenkins, Lieut. Col. F.          |

|                               |                                   |
|-------------------------------|-----------------------------------|
| Jones, R. Esq.                | Ramanath Tagore, Babu.            |
| Johnstone, Esq. John          | Ramgopaul Ghose, Babu.            |
| Jerdon, T. C. Esq.            | Rawlinson, Major H. C.            |
| James, Lieut. H. C. 32d N. I. | Ripley, Lieut. F. W.              |
| Karr, W. Seton, Esq.          | Rogers, Capt. T. E.               |
| Kittoe, Capt. M.              | Ram Chand Sing, Rajah.            |
| Kerr, J. Esq.                 | Ramaprasad Roy.                   |
| Keane, Rev. W.                | Richards, Rev. J.                 |
| Laidlay, J. W. Esq.           | Sleeman, Lieut. Col. W. H.        |
| Latter, Lieut. T.             | Sherwill, Lieut. W. S.            |
| Loch, G. Esq.                 | Spilsbury, G. G. Esq.             |
| Lackersteen, Count.           | Strachey, Lieut. R.               |
| Logan, J. R. Esq.             | Strong, F. P. Esq.                |
| Lamb, Dr. G.                  | Sutchurn Ghosaul, Rajah Bahadoor. |
| Low, Col.                     | Stewart, Dr. D.                   |
| Lawrence, Sir H.              | Sandberg, Rev. P. L.              |
| Mackenzie, J. Esq.            | Slater, Rev. S.                   |
| MacLeod, D. F. Esq.           | Staples, Lieut. N. A.             |
| Maddock, Hon'ble Sir T. H.    | Scott, Jas. S. B. Esq.            |
| Mill, J. B. Esq.              | Sandes, F. C. Esq.                |
| Muir, J. Esq.                 | Skinner, C. B. Esq.               |
| Mitchell, A. Esq.             | Strachey, John, Esq. (C. S.)      |
| Muller, J. Esq.               | Stubbs, Lieut. F. W.              |
| Money, D. J. Esq.             | Thomason, Hon'ble J.              |
| MacLagan, Lieut. R.           | Tickell, Capt. J. R.              |
| M'Clelland, Dr. J.            | Torrens, H. Esq.                  |
| Maxwell, Lieut. H.            | Trevor, C. B. Esq.                |
| Newmarch, J. Esq.             | Thuillier, Capt. H. E. L.         |
| Ommaney, M. C. Esq.           | Thomas, R. Esq.                   |
| O'Shaughnessy, W. B. Esq.     | Tayler, W. Esq.                   |
| Ouseley, Lieut. Col. J. R.    | Thornhill, C. B. Esq.             |
| Ouseley, Capt. R.             | Udny, G. Esq.                     |
| Peel, Hon'ble Sir L.          | Walker, H. Esq.                   |
| Phayre, Capt. A.              | Wilby, G. R. Esq.                 |
| Prinsep, C. R. Esq.           | Willis, J. Esq.                   |
| Prosonocoomar Tagore, Babu,   | Wagh, Lieut. Col. A. S.           |
| Pratt, Rev. Mr. J. H.         | Wilson, Daniel. The Right Rev.    |
| Pakenham, Capt. G. D.         | Lord Bishop of Calcutta.          |
| Radhakant Deb, Rajah Babadoor | Young, Dr. R.                     |

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LIST OF MEMBERS ELECTED IN 1848.

Alexander, Henry R. Esq.  
Austen, Lieut. Albert G.  
Bell, Dr. Adam.  
Banks, Capt. J. S.  
Corcoran, Jas. Esq.



Champneys, Capt. E. G. L.  
 Colebrooke, R. Esq.  
 Gubbins, C. Esq.  
 Gobinda Chunder Sen, Babu.  
 Hay, A. Esq.  
 Harsey, Lieut. Col. W.  
 James, Lieut. H. C.  
 MacLagan, Lieut. R.  
 Massey, G. Esq.  
 M'Clelland, Dr. J.  
 Maxwell, Lieut. Harley.  
 Pakenham, Capt. G. D.  
 Richards, Rev. J.  
 Ramchund Sing, Rajah.  
 Ramapersaud Roy, Babu.  
 Strachey, John, Esq.  
 Stubbs, Lieut. F. W.  
 Tayler, W. Esq.  
 Thornhill, C. B. Esq.

List of Members who have returned from Europe and rejoined the Society :—

Dr. H. Falconer.  
 G. Blundell, Esq.  
 C. Huffnagle, Esq.  
 Sir H. Lawrence, K. C. B.

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#### LOSS OF MEMBERS DURING THE YEAR 1848.

##### *By Death.*

Hodgson, Major General J. A.  
 Lushington, G. T. Esq.  
 Massey, G. Esq.  
 Stacey, Lieut. Col. L. R.  
 Wilcox, Major R.

##### *By Withdrawals.*

Debendranath Tagore, Babu.  
 Goodwin, Major H.  
 Hume, J. Esq.  
 Jameson, W. Esq.  
 Knighton, W. Esq.  
 Linstedt, E. Esq.  
 McKilligan, J. P. Esq.  
 McLeod, W. C. Esq.  
 Middleton, J. Esq.  
 Manuckjee Rustomjee, Esq.  
 Mackey, D. C. Esq.

Nripendranáth Tagore, Babu.  
 O'Dowda, R. Esq.  
 Rustomjee Cowasjee, Esq.  
 Smith, Lieut. R. B.  
 Thornhill, H. Esq.  
 Thwaites, R. Esq.  
 Thompson, Rev. Mr. J.  
 Ward, J. Esq.

*By departure to Europe.*

Baker, W. C. Capt.  
 Boyes, W. E. Capt.  
 Brandreth, J. E. L. Esq.  
 Cameron, Hon'ble C. H.  
 Forbes, Lieut.-Col. W. N.  
 Gilmore, A. Esq.  
 Grant, W. P. Esq.  
 Hardinge, Hon'ble C. S.  
 Hay, Lord Arthur.  
 Macqueen, Rev. L.  
 Ravenshaw, E. C. Esq.

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LIST OF HONORARY MEMBERS.

Baron von Hammer Purgstall, Aulic Counsellor, Vienna.  
 Professor Augustus von Schlegel.  
 ——— Rasmussen, }  
 ——— Oersted, } Of the Royal University of Copenhagen.  
 ——— Fræhn. }  
 Monsieur Garcin de Tassy.  
 Sir John Philippart.  
 Professor R. Jameson,  
 Count Carlos de Vidua.  
 ——— De Noe.  
 Professor Francis Bopp.  
 ——— E. Burnouf.  
 ——— Christ. Lassen.  
 ——— A. Langlois.  
 Monsieur J. J. Marcel.  
 Professor Heeren.  
 ——— M. J. Klaproth.  
 The Rev. William Buckland, D. D.  
 Sir John F. W. Herschell.  
 Col. W. H. Sykes.  
 Chevalier Ventura.  
 General M. A. Court.  
 Professor Lea, *Philadelphia*.  
 Dr. Harlan, *Philadelphia*.

Monsieur P. A. Lair, President of the Society of Agriculture and Commerce, Caen.

Right Hon'ble Sir C. W. W. Wynn.

Professor H. H. Wilson.

Sir George Staunton.

The Baron Schilling, *Cronstadt*.

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# JOURNAL

OF THE

# ASIATIC SOCIETY.

JANUARY, 1849.

*A Seventeenth Memoir on the Law of Storms in India, being Storms of the China Seas from 1842 to 1847, and some of the Northern Pacific Ocean, from 1797. By HENRY PIDDINGTON, President of Marine Courts of Enquiry, Calcutta.*

## PART I.—CHINA SEAS.

[In this paper the word Cyclone is used to express any *turning* gale or typhoon.]

In the sixth of this series of Memoirs, (Journal Vol. XI.) I have collected all that could then be obtained relative to the storms of the China Sea from 1780 to 1841, and I have reason to believe that in no one instance, then, had any contradiction been found to the law for the tracks which was announced as the result of the researches embodied in that paper, to the which, for the China sea, the present is a necessary supplement.

This law may be stated in general terms to be that, though varying at different seasons of the year in the Typhoon months, yet they are always from some point to the Eastward of the meridian, or from between N. b E. and S. b E. to the Westward and North-Westward, having, sometimes, not straight but curving tracks; and the utility of tracing out, if documents can be obtained, the track of every Cyclone, in this and in every sea, is to ascertain beyond contradiction and controversy if any Cyclone has travelled from any part to the westward of the meridian, and further, to obtain more exact data on which to found our judgment of what the average tracks in each separate month are most likely to be; for upon the right knowledge of the tracks of the Cyclones, whether deduced

at the time at sea, or laid down from previous research, depends the successful management of the ship when involved in or threatened by them; and it will be seen that, as from analogy, I had supposed it possible, so we *have* now found that some rare anomalies of tracks to the Eastward of the Meridian do take place in two dangerous parts of the sea, the Straits of Formosa and Bashee Passage.

In the part relative to the storms of the Northern Pacific Ocean, I have comprised all that I have been able to collect relative to this great, and to us, very important field of our research, comprising as it does nearly the whole Eastern Coast of China, the stormy seas of Japan, and that great tract extending to the N. W. Coast of America, and bounded perhaps only by the Equator,\* in which these wonderful meteors take their rise.

1840.

#### TRACKS A. and B.

##### *The GOLCONDA'S Storm, September 1840.*

*Log of the Ship HASHMY, Captain BUCKLE, from Singapore to China.*

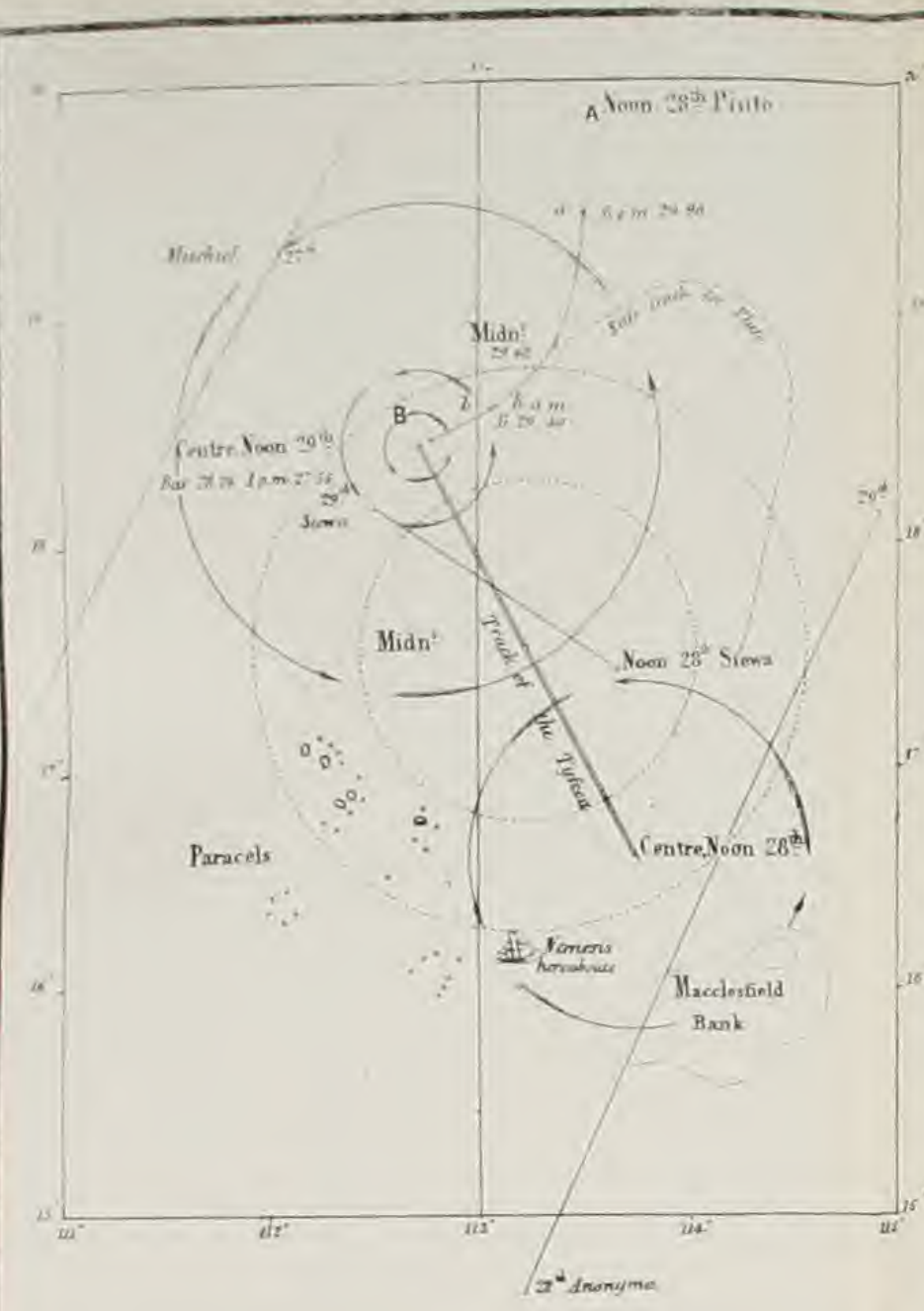
In my fourth Memoir, (Journal Asiatic Society for 1841, Vol. X.) I showed that this unfortunate ship, the *Golconda*, with 300 Madras troops on board, was in all probability lost on the 23d—24th September, about the spot where the centres of two tyfoons, the one from the E. S. E., and the other from the S. by E. met; but though indubitably there were two storms, it was not possible from the logs of one ship for each storm† to affirm that we had laid down correctly the exact line of the tracks.

Having subsequently received a capitally well kept log from Captain Buckle of the *Hashmy*, I find with great satisfaction that the track of the Northern Cyclone is perfectly correct as to direction, the only correction to be made being, that the centre of the 22nd, the first day, requires to be placed 70 miles farther to the Eastward: but at the approach of Cyclones, the estimation of the ship's distance from the centre is always of great uncertainty without hourly observations of the Barometer and careful measurement of the ship's run.

\* At the Kingsmill groupe, *upon* the Equator, hurricanes are known to prevail.

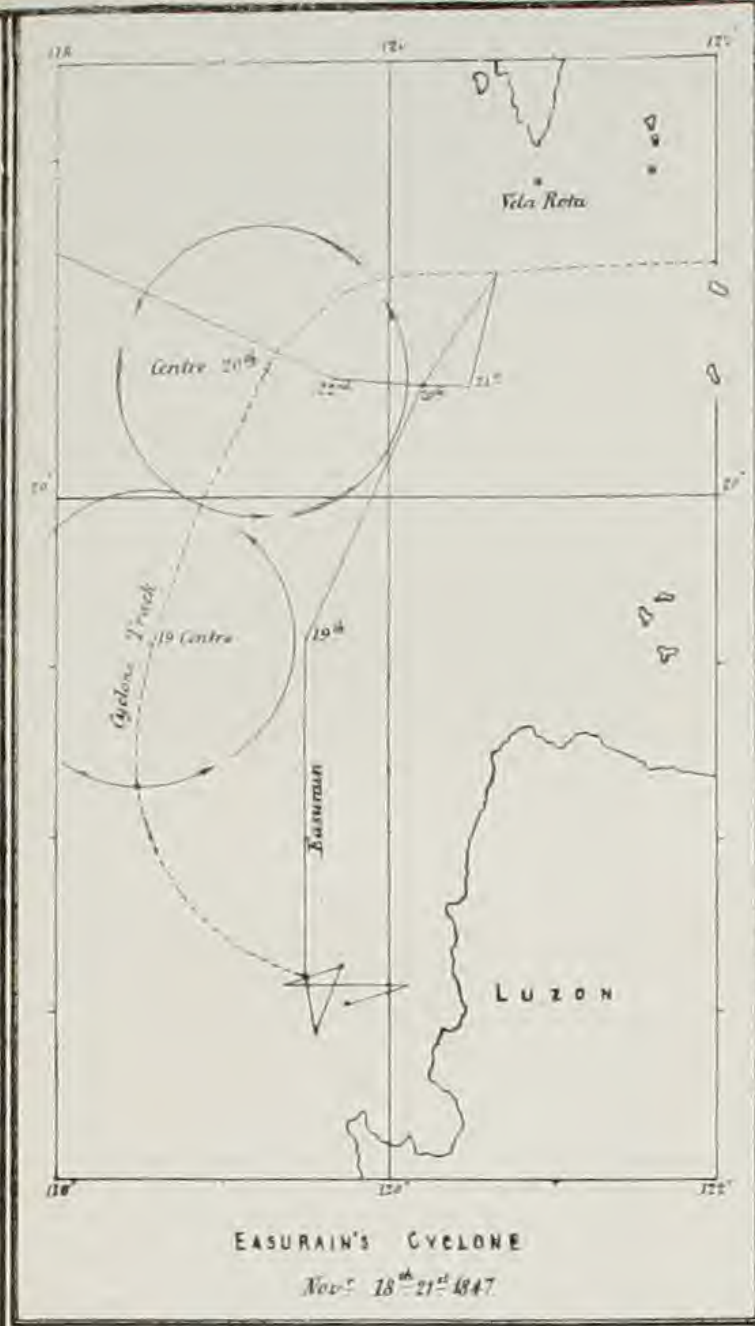
† The London *Thetis* and the Calcutta *Thetis*.





TRACK OF THE H. CO'S STEAMER PLUTO,  
STEAMING INTO A TYFOON IN THE CHINA SEA

28<sup>th</sup> 29<sup>th</sup> June 1846







I give below the abridged log of the *Hashmy*, reduced to civil time, and then a few brief remarks.

“On the 18th September 1840, at 8 A. M. the *Hashmy* sounded in 26 fs. on the Macclesfield Bank; she had light breezes and sultry weather at noon, when she had no soundings at 100 fs. Lat. observed,  $16^{\circ} 20' N.$ ; Long. Chr.  $114^{\circ} 24' E.$ ; Bar. 29.90; Simp. 29.56; Ther.  $89\frac{1}{2}^{\circ} E.$  To midnight light winds.

19th. Sept.—A. M. and till noon the same winds and fine. Noon Lat.  $17^{\circ} 34'$ ; Long. Chr.  $114^{\circ} 39'$ ; Bar. 29.89; Simp. 29.55; Ther.  $88^{\circ}$ . To midnight light winds inclining to calm and hazy weather.

20th.—Light airs westerly and N. westerly, and fine till noon, Lat.  $18^{\circ} 28' N.$ ; Long. Chr.  $114^{\circ} 37' E.$  Bar. 29.87; Simp. 29.55. Ther.  $86\frac{1}{2}^{\circ}$ ; P. M. wind light at N. W.; at 8 north; squally and so till midnight.

21st.—Daylight increasing fresh breeze with dark squally appearance. At 8 A. M. wind marked N. N. E. and the same at noon, when a strong breeze with a heavy head swell; Lat.  $18^{\circ} 47' N.$ ; Long.  $115^{\circ} 48' E.$  Bar. 29.77; Simp. 29.47; Ther.  $85$ . P. M. Wind at 2 P. M. N. N. E. and at 9 N. b. E. Increasing bad weather and making preparations to meet it. Midnight, fresh gale, and heavy head swell N.; for the last 36 hours the ship has been standing to the N. E. and eastward; Lat. about as at noon.

22nd Sept.—A. M. breeze increasing and north a heavy sea getting up; at daylight hard gale with heavy squalls; sails blowing out of the bolt ropes, wind always north; ship hove to on *larboard* tack; noon heavy gale with a high and confused sea. A. M. pumps constantly going. Lat. Acct.  $18^{\circ} 30' N.$ ; Long. Acct.  $117^{\circ} 18' E.$  Bar. 29.32; Simp. 29.04. P. M. still increasing; 4 P. M. a perfect hurricane from N. eastward; at 11 P. M. after a slight lull the wind shifted to East and S. E. and continued to blow if possible with more violence than before, the glasses having been, between this time and 8 A. M. of 22rd, down to—Bar. 28.65; Simp. 28.40; Ther.  $80\frac{1}{2}^{\circ}$ . At midnight wind marked East.

23rd Sept.—Hurricane still continuing; at 8 A. M. the glasses shewed indications of rising though still blowing tremendously hard. During the strength of the gale the ship lay buried in the seas which made a clear breach over her, expecting at every minute to lose the masts. At 3 A. M. Bar. 28.65; Simp. 28.40; Ther.  $81\frac{1}{2}^{\circ}$ ; at 4 Simp. began to rise slightly. At 8 Bar. 28.90; Symp. 28.95; Ther.  $80\frac{1}{2}^{\circ}$ . Noon wind marked S. E. Lat. Acct.  $18^{\circ} 16' N.$ ; Long.  $116^{\circ} 30' E.$  Bar. 29.20; Simp. 29.03. Ther.  $81^{\circ}$ . P. M. heavy gale, furious gusts and high cross sea; wind S. E. and at 4 P. M. S. E. b. S. At 3.30 bore up and attempted to run under the reefed foresail, but the heavy seas constantly breaking on board and the squalls occasioning the ship to broach too, hove too again at 6.30 P. M. on starboard tack; wind S. E. b. S.; head to N. E.

24th Sept.—A. M. strong gale; at 2 set the reefed foresail again. Daylight bore



away, wind S. E. Gale moderating, but a high cross sea. Noon Lat. Obs.  $19^{\circ} 19' N$ ; Long. Chr.  $115^{\circ} 39' E$ ; Bar. 29.55; Simp. 29.42; Ther.  $80^{\circ}$ . After this fine. The ship arrived in sight of the Great Lema at 5 P. M. on the 25th, carrying a fine S. E. breeze all the way."

The following table is that which is given at p. 901 of Vol. X. of the Journal, with the addition of the *Hashmy's* log to it, from which it will at once be seen how remarkable are the differences between her winds and those of the London *Thetis*, though only from 90 to 150 miles apart.

*Tabular view of the Hurricane of 22nd and to 24th September 1840, in the China Sea, as experienced by the ships*

*Thetis of London, Thetis of Calcutta, and Hashmy.*

| <i>Date.</i>           | <i>Ship's Name.</i> | <i>Winds and Weather.</i>                                                                           | <i>Lat. N.</i>   | <i>Long. E.</i>   | <i>Bar.</i> | <i>Simp.</i> | <i>Ther.</i>     | <i>Remarks.</i>                                                                          |
|------------------------|---------------------|-----------------------------------------------------------------------------------------------------|------------------|-------------------|-------------|--------------|------------------|------------------------------------------------------------------------------------------|
| 19th Sept.<br>at Noon. | London Thetis.      | Light Southerly, hot and sultry weather,.....                                                       | $14^{\circ} 20'$ | $113^{\circ} 39'$ | 29.94       | ....         | $86\frac{1}{10}$ |                                                                                          |
|                        | Calcutta Thetis.    | Light S. W. airs and fine, ..                                                                       | $11^{\circ} 44'$ | $115^{\circ} 15'$ | 29.79       | ....         | 92               |                                                                                          |
|                        | Hashmy.             | Light breezes and fine, hazy.                                                                       | $17^{\circ} 34'$ | $114^{\circ} 39'$ | 29.89       | 29.55        | 88               |                                                                                          |
| 20th Sept.<br>at Noon. | { London Thetis.    | Calms and light S. E. airs, and sultry, .....                                                       | $14^{\circ} 53'$ | $114^{\circ} 9'$  | 29.90       | ....         | 87               | At midnight squally weather.                                                             |
|                        | { Calcutta Thetis.  | S. W. and W. S. W. airs and fine, .....                                                             | $12^{\circ} 40'$ | $111^{\circ} 57'$ | 29.79       | ....         | 89               |                                                                                          |
|                        | Hashmy.             | Light airs, West and N. W. P. M. N. W., .....                                                       | $18^{\circ} 28'$ | $114^{\circ} 37'$ | 29.87       | 29.55        | $86\frac{1}{2}$  | { 8 P. M. northerly winds and squally to midnight.                                       |
| 21st Sept.<br>at Noon. | { London Thetis.    | Light N. W. wind, gloomy and close, .....                                                           | $15^{\circ} 57'$ | $115^{\circ} 9'$  | 29.87       | 29.30        | 84               | { Noon rain, thunder, and squally, wind N. W.; Simp. very unsteady during this 24 hours. |
|                        | { Calcutta Thetis.  | Light from W. N. W. till 7 P. M.; at 7 breeze freshening from N. N. W.; thick cloudy weather, ..... | $13^{\circ} 20'$ | $112^{\circ} 40'$ | 29.70       | ....         | 89               | { By midnight fresh gale N. b. E. and heavy head swell; making preparations to meet it.  |
|                        | Hashmy.             | N. N. E. strong breeze and heavy head swell, ....                                                   | $18^{\circ} 47'$ | $115^{\circ} 48'$ | 29.77       | 29.47        | 85               |                                                                                          |

|                             |                                                 |                                                                                                                                                  |                              |                |       |     |                                                                                                                                                                 |
|-----------------------------|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|----------------|-------|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 22nd Sept.<br>at Noon.      | { London Thetis.<br>Calcutta Thetis.<br>Hashmy. | N. N. W. increasing breeze<br>and sea, .....                                                                                                     | 16 20 115 30                 | 29.64          | 29.12 | 85½ | { Threatening sea rising, glass falling,<br>and wind increasing; hove to.<br>{ Increasing with gloomy weather;<br>running to the N. E.                          |
| 22nd Sept.<br>at midnight.  | { London Thetis.<br>Calcutta Thetis.            | W. b. S. strong breezes, ..<br>Heavy gale, North, veering to<br>N. Eastward; high sea, ..<br>W. N. W. violent gale, terri-<br>fic squalls, ..... | 14 55 114 55<br>18 30 117 18 | 29.56<br>29.32 | 29.04 | ..  | Barometer still falling.                                                                                                                                        |
|                             |                                                 | S. W. increasing and ince-<br>sant squalls; running to the<br>N. E. and N. W. since<br>noon, .....                                               | .. .. .                      | ....           | ....  | ..  |                                                                                                                                                                 |
|                             | Hashmy.                                         | Hurricane from Eastward<br>more violent than before, ..                                                                                          | .. .. .                      | 28.65          | 28.40 | 80½ | { Sea getting up from S. W.<br>After a slight lull at 11 P. M. shift-<br>ing from N. E. to East and S. E.<br>Barometer marked between mid-<br>night and 8 A. M. |
| 23rd Sept.<br>at Noon.      | { London Thetis.<br>Calcutta Thetis.<br>Hashmy. | S. W. almost a hurricane, ..<br>S. W. furious typhoon, lying to,<br>Wind S. E. heavy gale, furi-<br>ous gusts and cross sea, ..                  | 16 40 116 15<br>15 50 115 13 | 29.20<br>28.80 | 28.73 | ..  | No abatement.<br>High sea; lost mizen topmast.                                                                                                                  |
| 23rd Sept. at<br>midnight.* | { London Thetis.<br>Calcutta Thetis.<br>Hashmy. | About South, moderating<br>fast, .....                                                                                                           | .. .. .                      | 29.20          | 29.08 | 81  | { Bar. 3 A. M. 28.65; Simp. 28.40; at<br>4 R. M. rising.                                                                                                        |
|                             |                                                 | S. W. heavy, typhoon, squalls,<br>not so frequent, .....                                                                                         | .. .. .                      | 29.50          | ....  | ..  | { Bore up at 5 P. M. Sea higher than<br>in the gale.                                                                                                            |
|                             |                                                 | S. E. b. S. but abating, .....                                                                                                                   | .. .. .                      | ....           | ....  | ..  | Sea very cross.<br>{ 4 P. M. bore up but hove to again at<br>6.30 P. M.                                                                                         |
| 24th Sept.<br>at Noon.      | { London Thetis.<br>Calcutta Thetis.<br>Hashmy. | S. S. E. moderate, .....                                                                                                                         | 18 25 117 20                 | 29.80          | ....  | 81½ | { Fine and squalls, wind S. E. and<br>moderate to Macao.                                                                                                        |
|                             |                                                 | S. gale breaking, .....                                                                                                                          | 17 14 115 35                 | 29.40          | ....  | ..  | { A. M. rolled away the mainmast<br>at 8 P. M., wind S. S. E.                                                                                                   |
|                             |                                                 | Bearing up, .....                                                                                                                                | 19 19 115 39                 | 29.55          | 29.42 | 80  |                                                                                                                                                                 |

\* *Golconda* probably lost about this time.

## REMARKS.

Upon laying down the *Hashmy's* track and taking the storm, if not fairly begun, to be *threatening* at noon on the 25th, I find that producing backwards the track of the London *Thetis's* storm upon the chart appended to the Fourth Memoir, a point on it would agree for this day very well. The wind being at N. N. E. would place the centre of the storm at E. S. E. from the ship, and taking backwards the distance from noon to midnight on the 22nd, as there marked, it also agrees so far as such acute angles and large distances can be expected to do, the centre at noon on the 22nd would fall, however, about 70 miles further to the eastward than where it is marked on our chart, when laid down by the positions of the two ships, the *Hashmy* to the north-west, and the London *Thetis* to the W. S. W. of it.

For the 23rd, when both the ships lying too had fallen into the adjacent quadrants, from the storms having rapidly passed on between them, making the *Hashmy* to have now the centre bearing S. W. and the London *Thetis* the centre N. W. from them respectively, our centre is exactly correct, and the weather and Barometer exactly as they were to be expected, i. e. the weather more severe, because the centre was now nearer to the vessel, and the Barometer rising, because it had passed and was leaving her.

On the 24th, all the ships had fine weather. We have here an instance, and it is principally on that account that I have placed these two tracks again on our present Chart, of the complete reliance which, with careful observations of the wind, weather and Barometer, may be placed on our science; for no careful commander can now in future doubt, I should think of the awful risks which running on with a falling Barometer may expose him to, and no sailor who understands common trigonometry can doubt, I should suppose, of the accuracy of our deductions, and that they might, with the knowledge we now possess of the laws by which the Cyclones of the China Seas are governed, have been perfectly made on board the respective ships (including here the unfortunate *Golconda*, with her 400 victims) at any time during the tempests, so as to indicate to them all the best plans for escaping from, and even for profiting by the Cyclones, by a little curving in their courses.\*

\* Since this was written I have been favoured by my friend, Dr. Collins of the ship *Queen*, with a copy of the log of the ship *Sophia*, which ship, with the *Minerva*

## TRACKS C. and D.

CHUSAN and TUNG-HAI\* *Tyfoons, September 1843.*

The tracing of these Cyclones in so high a latitude is of great interest as connected with those of the Japanese and Formosan seas. I am indebted to Commander Vyner, *H. M. S. Wolf*, for the following.

“On the 1st of September 1843, a hurricane commenced, the centre of which passed over the Chusan archipelago, doing immense damage, and it would appear that the whirlwind was travelling from the S. E. to the N. W., as it was felt severely at Woosung in the Yang-tse-kiang river, about 120 miles from Chusan, about nine hours afterwards.

At about sunset of the 31st of August a dirty appearance of the weather began, wind from the N. N. E. with drizzling rain; about  $\frac{1}{2}$  past nine at night the wind began to increase and the Barometer to fall a little; at 10.30 p. m. a hurricane commenced at its full power from N. E. suddenly, and then the barometer commenced to fall rapidly, and by 2 a. m. of the 1st was at 28.22 and did not go lower. The commencement of the hurricane was so sudden that no apprehension was contemplated by any of H. M. ships or those of the merchant service, all being taken by surprise with their boats in the water, and top-gallant yards across.

in company, ran up on a N. W. course from the 22d to the 23rd, just across the Eastern and S. Eastern borders of the Cyclones of the ships *London* *Thetis* and *Calcutta* *Thetis*, with, of course, a heavy S. Westerly gale amounting in violence to a typhoon, and on the 23rd, when exactly on the track over which the Cyclone of track B. had just passed, they hove too *fearful of a shift of wind*. I need not remark that they would have been perfectly safe in running on then. We have thus, from the logs of three separate ships an exact corroboration of what was originally laid down from two.

\* TUNG-HAI, (the Eastern Sea,) is the name given by the Chinese to the sea enclosed between their Eastern coasts and the chain of islands which stretches from the south of Corea and includes Japan and Formosa. The Northern part of this sea from about 35° North, is the Wang-Hai or Yellow sea. The Japanese or Japan sea is the sea to the North of Japan and to the East of Corea. We want a fixed name for this first sea, for Eastern sea is far too indefinite; it might be distinguished by its Chinese name of Tung Hai, or as the Formosa sea? though this last might confound it again with the Straits of Formosa. Perhaps the Loo-Choo Sea would be the best we could choose for it, and I have so called it on my Chart? In a French Atlas of 1838, the straits between Formosa and the Coast of China (our straits of Formosa) are called the straits of Fokien, and the Tung Hai, for which I propose the name of the Loo Choo Sea, is called the Corean Sea, which would more appropriately belong to the Yellow sea. These names are of no great consequence, it will be said, but, it is to be regretted that we cannot settle them.



When once the hurricane began it was fruitless to attempt sending men aloft, for they could do no more than with great difficulty prevent themselves from being blown out of the rigging,\* but during the  $\frac{1}{2}$  hour that the centre of the whirlwind was passing, it being a dead calm, the opportunity was seized to secure the boats and get the masts down.

As soon as the half hour had expired the hurricane again struck us from S. W. and blew violently until 6 A. M. when it gradually subsided.

The Barometer commenced rising rapidly from the moment the N. E. wind ceased, and continued to rise throughout the S. W. part of it. Three vessels were driven on shore, the barracks at Sin-kea-Mun (East end of Chusan) were blown down, 1 soldier killed and several wounded. Many houses were blown down and unroofed; crops entirely destroyed and many lives lost both on shore and at sea amongst the Chinese; trees were torn up by the roots and the whole country devastated. We learned from the old inhabitants of the island and the fishermen, that such a hurricane had not visited Chusan for 11 years, at which time a similar one took place; they are said to be uncommon."

In reply to subsequent enquiries, Commander Vyner says :—

"I have not heard of any vessel meeting the hurricane at sea, nor of its being felt on shore or at sea to the Southward of Chusan; that it was felt at Woosung is certain, although I am not sure if the calm was felt there, but I think it was.

I remember perfectly well a vessel arriving at Chusan about two days after the hurricane which was within a hundred miles of the place at the time and felt nothing of it. It would thus appear that the whirlwind was formed in the neighbourhood of Chusan."

#### TRACK D.

##### *CACIQUE'S Typhoon, September 1843.*

A Canton paper gives the following account of a second Typhoon following close upon the one just described. After briefly relating the particulars of the Chusan Typhoon of the 1st and 2nd, which agree exactly with the foregoing, and adding that in it the *Cacique's* Barometer fell to 28.30,† it continues :—

"The *Cacique* sailed from Chusan on the 4th inst., and on the 5th, about 100 miles North of Formosa, again encountered a heavy Typhoon commencing with a N. E. gale which continued with a heavy sea from the Eastward until 1 P. M., when, as at Chusan, it fell suddenly calm, during which thousands of

\* This was in an English man-of-war, and in a snug anchorage, and it gives us some idea of what the destructive fury of these meteors must be.

† Newspaper says 27.10, but this, by a subsequent paragraph, appears to be certainly a misprint.

birds threw themselves on the deck. In a short time the wind rose again from the S. W. and soon increased to a terrific hurricane. Anticipating the change of wind, they set the close-reefed foretopsail and foretopmast stay-sail just in time to catch the wind as it struck the vessel, by which means she was payed off before the wind, when all sail was taken in, leaving her scudding under bare poles till 5.30 P. M. when the easterly swell having gone down considerably and the wind abating a little, the *Cacique* was hove to with her head to the S. S. E. under a close-reefed maintopsail and balanced mizen. At midnight the weather became moderate, and the barometer, which at 1 P. M. was down to 28.25, had risen to 29.20. The *Cacique* stood the tempest remarkably well, and lost nothing of consequence; made no water, and did not ship a single sea. She saw the Brig *William* off Oksue apparently beating away for Chimmo, and arrived at Hongkong on the 13th, after a remarkably short passage of 19 days. In another notice in the *Friend of China*, it is said that this Cyclone occurred in 27° N. Long. 122° East and that, the ship's barometer gave 8 or 9 hours warning, the calm lasting only about 5 minutes.

I have not been able to obtain any farther notice of this Cyclone, but there is no doubt that it was travelling like the former from the S. E. to the N. W.

#### TRACK E.

*Typhoon of the ATLET ROHOMAN and SHAH ALLUM, November 1843.*

These two vessels experienced a severe Typhoon in November 1843. The following are the abridged logs, with some additions, from the *Singapore Free Press* of 29th November.

*Abridged Log of the ship SHAH ALLUM, Captain EVANS, reduced to Civil Time.*

The Ship *Shah Allum*, Capt. Evans, from China to Bombay, was at Noon 31st Oct. 1842 in Lat. 19° 30' N.; Long. 112° 25' E.; Barometer 29.70, and at 10 P. M. 29.60, having left the Grand Ladrone at sunset the preceding evening. She was running to the S. S. W. 9 knots with wind N. Easterly and cloudy weather, 2 P. M. wind marked N. N. E. course S. S. W.  $\frac{1}{2}$  W. 142 miles to 3 A. M. on the 1st Nov. when she hove too. Midnight strong gale; 1st Nov. 3 A. M. heavy gale from the Northward (N. N. W.) hove too. Daylight typhoon from the N. W. 8 A. M. Bar. 29. 10 A. M. wind veered suddenly to the westward with greater violence. Mountainous sea; carried away quarter gallery, boats, &c. 10.30 A. M. lost main and mizen topmasts. Noon Bar. rising from 29.10 to 20, but typhoon still blowing with great fury.

P. M. wind veered to S. W. "with extraordinary gusts at times;" 1. P. M. Bar. 29.30. Gale moderating. At 3 wind South and clearing up; Bar. 29.40. Sun-

set made a little sail. During the night the weather became fine. Wind at 10 P. M. marked East.

2nd Nov.—At noon had made from 8 P. M. on the 1st to noon 2d, 66 miles on a S. b. W. course, Lat.  $16^{\circ} 39' N.$ ; Long.  $110^{\circ} 12' E.$  The newspaper quoted above adds to this:—

“Captain Evans says that the Barometer rising so high the day previous to the gale and falling so gradually, confirmed him in the opinion that they were going to have a strong N. East monsoon, and he carried on a press of sail to get well clear of the Paracels, but from observations taken the day after the gale they were during the worst of it about 20 miles W. N. W. from the North Shoal and drifting to the South East, but the wind veering to the Southward, S. E., and latterly to E. N. E., they were drifted to the W. S. W., 40 miles off the North Shoal by noon of the 2nd, when they had good observations. He is not certain whether the Barometer fell below what he has mentioned above, as he did not leave the deck from 10 P. M. until the sea washed the stern windows and boats away, but he thinks it did not, as about 10 and 11 it blew exceedingly severe from west and W. S. W.”

*Abridged Log of the Ship ATIET ROHOMAN, Captain LUGRIN, from Macao bound to Singapore—reduced to Civil Time.*

The *Atiet Rohoman* left the Dome of the Grand Ladrone bearing N. E.  $\frac{1}{2}$  E. and that of the Little Ladrone N. E. in 16 fs. water at 5h. 50' P. M. on the 30th October, 1843, with a N. N. easterly wind, 5, 6 and 7 knot breeze and a heavy S. E. swell to midnight.

31st Oct.—Wind N. E. b. E. and N. E. b. N.  $8\frac{1}{2}$  knot breeze, steering to the S. S. W.; at noon Lat.  $19^{\circ} 10' N.$ ; Long.  $111^{\circ} 42'$ ; strong gales and cloudy; P. M. hazy and increasing. At 10 P. M. a sudden gale from the N. N. E. Ship running 8 knots to the S. S. W.

1st Nov.—1 A. M. blowing a severe typhoon N. N. E.; 3 A. M. typhoon veered to N. E. Sails cut away and blowing from the yards. 9 A. M. wind marked N. E. Noon vessel half swamped, at 5 A. M. the wind is said in the remarks to have veered to E. S. E. 9 A. M. lost maintopmast, mizenmast, boats and an anchor. Noon severe typhoon; 3 ft. water in the hold; Lat. about  $17^{\circ} 03' N.$ ; Long.  $110^{\circ} 39' E.$  P. M. wind marked S. b. E. severe gale. Ship's head west; carried away the head of the rudder; at  $6\frac{1}{2}$  P. M. moderate and veered to the S. E.

2nd Nov.—A. M. clearing up and repairing damages; noon Lat.  $17^{\circ} 32' N.$ ; Long.  $109^{\circ} 13' E.$

#### REMARKS.

It is evident from the veering of the wind that these two ships were on opposite sides of a Cyclone, the *Shah Allum* on the 1st at 10 A. M.



being close to the centre, which was passing to the northward of her (wind West) while the *Atiet Rohoman*, at 9 A. M. had the tyfoon of excessive violence at N. E. ; and by noon it had veered to S. b. E. The average change with the first of these ships we may call from N. W. to S. W. giving an east course for the centre of her Cyclone, and for the *Atiet Rohoman* from N. N. E. to S. b. E., giving a course of about from S.  $85^{\circ}$  east to N.  $85^{\circ}$  W., or say a W.  $\frac{1}{2}$  N. course and the mean the two would therefore be a W.  $\frac{1}{4}$  N. course.

But this assumes the two ships to have been stationary like two islands, whereas both ran, and were drifted considerably to the southward before being drifted back to the northward. We cannot calculate this to any exactness, but we may say, with all allowances, that the Cyclone must really have been travelling, for them, about from E. b. N. to W. b. S., which is the track I have assigned to it. We have no further data for the distance it may have travelled from the eastward before reaching these two ships, but as it lasted a considerable time with them, and was yet, by the rapidity of the veering near the centre, travelling with considerable velocity, I have produced the track about four degrees to the eastward, though it probably extended farther, and as we shall see in the cyclones of 1847, may very probably have been felt, if it did not fully reach to the shores of Cochin China, about Turon Bay.

#### TRACK F.

##### *Manila Tyfoon of October, 1843.*

I have for this Cyclone but a single log, though a carefully detailed one, and quite sufficient to authorise us to mark off the track of it across what is, at some seasons, a dangerous anchorage, and where too much caution cannot be used, whether lying at Cavite or off Manila, during the whole of the tyfoon months. The extract of the log which I have is contained in a letter from the Captain of the American ship *Unicorn*, to Mr. Redfield, and by him forwarded to me. It is as follows:—

“ October 30th, 1843.—(Civil Time at Manila,\*) begins calm and dark lowering weather, Bar. 29.90. 3 P. M. the same ; Bar. 29.90. 4 P. M. a light breeze from N. N. E. Bar. same ; 6 P. M. wind veered to north, increasing dark gloomy weather, Bar. 29.89. 7 P. M. thick and rainy, very sultry and has been for 24 hours ; *felt two heavy shocks of an earthquake* ; blowing fresh, Bar. 29.84 ; 9 P. M.

\* Ship then lying at anchor in the Bay of Manila ; this was the 29th by European account.

wind veered to N. by W. increasing thick and rainy, a wild look. Bar. 29.79; got down top-gallant masts and yards; 10 P. M. wind shifted suddenly to N. W. and commenced blowing hard squalls, steady rain, dark and gloomy; Bar. 29.75; 12, blowing very hard in squalls, sea making up; Bar. 29.55; 2 A. M. blowing furiously, let go 3d anchor and veered out all the cable; ship holding on, others dragging past us; Bar. 29.35. 4 A. M. blowing a hurricane; got topmasts and yards down, let go stream anchor, the fleet driving past us; a heavy sea on, ship pitching bows under, hard squalls, steady rain, dark gloomy weather; Bar. 29.30. 6 A. M. blowing furiously in squalls, the ship started her anchors and drove 4 miles before she brought up; drove from 5 into  $3\frac{1}{2}$  fathoms water; an English Brig, driving past us broadside to the wind, sea making a breach over her; Bar. 29.20; the trees began to give away to the force of the wind, many on the roads lying prostrate. 8 A. M. gale unabated, three vessels on shore; Bar. 29.20. Noon, gale in its fury, steady rain in torrents. Bar. 29.40. 1. 30. A. M. it fell a still calm instantly for five minutes, the wind shifted suddenly to S. S. E. and blew as hard as ever; the rain pouring in torrents; Bar. 29.44. 2. 30. A. M. moderating fast, sea going down rapidly, wind S. S. E.; Bar. 29.51. 4 A. M. wind veered to south, more pleasant; Bar. 29.66. 6 A. M. calm and cloudy, Bar. 29.75; much sea on.

In this gale three vessels drove on shore and all the fleet at anchor in the Bay dragged 3 or 4 miles. It appears the gale was felt severely in the China sea, as two English ships came in dismasted after it, one of them was off the Pratas Shoal at the time, from Macao bound to Chusan, the other off the Macclesfield Bank, from Macao for Bombay.

A Brig was at the time in Bernadino straits and reported having a very strong N. W. wind but clear weather and smooth sea."

A Singapore newspaper gives the following notice, but it is uncertain if at this late period of the season the gale may not have been the monsoon and not part of a Cyclone. From the dates it could not have been the same as the *Unicorn's*.

"The *Cecilia*, Captain Buttry, suffered severely during the late gale. At the commencement, on the 28th October (sea time) in Lat.  $17^{\circ} 32' N.$ ; Long.  $119^{\circ} 49' E.$  met with heavy gales from the N. N. E. which continued with increasing fury until the 31st, when it blew a hurricane. The *Cecilia* lost two men, one of whom was washed overboard. Part of her cargo was obliged to be cast overboard, and the copper sheathing was washed from the starboard side of vessel. On the weather moderating on the 2d November, found themselves in Lat.  $17^{\circ} 4' N.$ ; Long.  $112^{\circ} 57' E.$ "

The shifts experienced by the *Unicorn*, N. W. to S. S. E. gives a

track of from N.  $56^{\circ}$  East to the South  $56^{\circ}$  West, across the anchorage of the Bay of Manila.

### TRACK. G.

#### *The EDMONSTONE's Typhoon of Nov. 1844.*

*Abridged Extract from the Log of the Ship EDMONSTONE, Captain McDUGAL, from Hong Kong, bound to Singapore, reduced to Civil time.*

The *Edmonstone* left Hong Kong on the 14th Nov. 1844, and at Noon on that day was in Lat.  $21^{\circ} 3' N.$ ; Long. Chr.  $113^{\circ} 6' E.$ ; P. M. to midnight a 6 and 7 knot breeze from N. N. E. and fine weather.

15th Nov.—A. M. the same breeze; Noon, Lat.  $18^{\circ} 42'$ ; Long. East  $110^{\circ} 50'$ ; Bar. not given; having steered S. S. W.  $\frac{1}{2}$  W.  $157'$  for the preceding 24 h. P. M. the same, midnight and fine.

16th Nov.—Daylight; rolling heavily. Wind always N. N. E. to 8 A. M. wind N. b. E.; at 11. A. M. in first reefs; Noon no Obsr. Lat. Acct.  $16^{\circ} 15'$ ; Long.  $110^{\circ} 51' E.$ ; P. M. strong gales and threatening appearance, made all snug. Wind N. b. E.; Bar. 29.70. At 5. P. M. 29.60; ship running from Noon to 6 P. M. S. S. E. when she hove too with head to the East, position by estimation being 40 miles south of the Triton's Bank and on its meridian; when brought to at 10. P. M. Bar. 29.00; midnight, wind the same, Bar. 28.50; at 9 P. M. the last of the sails, the main-topsail, blew from the yard, the quarter boats, furled sails, &c. being all gone;—"the force of the wind and rain at this time was such that we could not shew our faces over the rail." At midnight blowing a most furious Typhoon, all the masts were blown out of the ship with the exception of the foremast.

17th Nov.—Found it impossible to cut away the wreck till Noon; 3. A. M. wind N. b. E.; 4, Bar. 28.60; 5 A. M. wind N. W.: at 8 West; 10. S. W. and at Noon south; Lat. Acct.  $14^{\circ} 22'$ ; Long.  $111^{\circ} 31' East$ ; P. M. wind if any thing abating; Bar. 28.60. Midnight "the sea as high as ever and rising in peaks high over the ship." Wind hauling to the south.

18th Nov.—To noon the same weather as before: Bar. 28.80; awful sea on and much difficulty in keeping the Lascars to the pumps. Wind abating.

19th Nov.—Daylight bore up under the (newly bent) foresail, "wind being again at North (it having gone completely round the compass) where it had been stationary throughout this severe typhoon; Noon, Lat. Acct. worked back from 20th,  $11^{\circ} 57' N.$ ; \* Bar. 29.20; Ther.  $70^{\circ}$ . P. M. running to the south with a fine Northerly breeze."

\* With allowance for the sea, but not for the Storm Current.

The wind here seems to have been steady at N. b E. from 6 P. M. to 3 A. M. or for 9 hours, or as nearly so as could be ascertained at night, and in such weather, during which time we may allow the ship to have made a drift of at least 3 miles per hour, or 27 miles in all. The fall of the Barometer from 5 P. M. to 10 P. M. was from 29.60 to 29.00 or 0.60. in 5 hours, giving an average fall of 0.12 per hour. By the rule given at p. 199, of the Sailor's Horn Book, this would give 80 miles for the distance of the centre at  $7\frac{1}{2}$  P. M., and we find that it passed her, though without any calm, about 4 A. M. on the following morning, or at  $8\frac{1}{2}$  hours from this time, which would give a rate of travelling of somewhat less than ten miles per hour.

We find that though the ship was drifting to the southward (about S. b. W. appears to have been the drift made good by the log) she still had the wind steady from N. b. E. up to 3 A. M., which would give her a drift of say 22 miles about up to 4 A. M. when, as the wind was N. W., the centre then passing close to the northward of her position bore N. E. of her. Projecting this it gives a course of from E.  $\frac{1}{4}$  N. to W.  $\frac{1}{4}$  S. for the track of the storm, which is that which I have assigned to it.

### *Cyclones of 1845.*

The following newspaper notice is all that I possess relating to this Cyclone, if it was one, for it may have been only the onset of the monsoon, though the veering of the wind being as much as ten points, gives great probability to the supposition that it may have been a true Cyclone travelling to the south-westward. My principal motive for inserting it however is the season at which it occurred, which is earlier than any typhoon of which we have a record, and we may, as so frequently has been the case, obtain other documents to connect with it. At present I do not insert it as a track, but it will serve to put the vigilant mariner on his guard.

“*Typhoon in the China seas.*—Captain Uceda of the Spanish brig *Dardo*, which arrived here a few days since from Manilla, reports the occurrence of a severe typhoon in the China seas, experienced by the *Dardo* in Lat.  $14^{\circ} 00' N.$ ; and Long.  $119^{\circ} 30' East$ . The typhoon commenced on the 21st of May, from W. N. W., varied to W. then S. W. and terminated on the 24th May at S. The only injury sustained by the *Dardo* was the loss of her top-gallant masts, but it is feared that vessels in the China seas may have suffered severely from the effects of the typhoon.”—*Singapore Free Press*, July 27, 1845.



## TRACKS H. and I.

*North Pacific Ocean and China Sea Typhoon of October 1845.*

I am indebted for the data of this track to Rear Admiral Parker, by whose order several logs and a sketch chart were transmitted to me through Mr. Elliott, Master of *H. M. S. Agincourt*, and to Capt. H. Gribble, late of *H. C. S. Repulse*, who also sent me several brief abstracts ; I have placed together the logs of these two tracks, because it is quite probable that the two Cyclones were connected, though we have no direct evidence of the fact. *H. M. S. V. Driver*, bound to New Zealand, met with a Cyclone on the 6th Oct. in the Pacific Ocean, in Long.  $127^{\circ} 30'$  east, and the *John O'Gaunt*, the first of the vessels which suffered from it in the China Sea, had it commencing on the 8th in about the same latitude, but in  $116^{\circ} 40'$  East. This gives a distance of about 650 miles to be traversed in two days, which will allow a nearly average rate of 13.5 miles per hour.

As before noted I have no intermediate notices to connect these two, except one from the *Friend of China* of the 31st Dec., of the loss of the Bremen Brig *Express* from Mazatlan to China with treasure, on the Bashees, on the 8th October, of which the following is also a newspaper notice from Singapore. The circumstance that the *Driver's* Cyclone, Track H. was travelling to the northward of west, while that of the *Ann Espiegle* and other ships is to the southward of west, I do not consider as material, for I have no sort of doubt that a Cyclone might be deflected by the lofty mountains on the north of Luconia and curve away to the southward after it had passed them, if it met then for instance, with a strong N. E. breeze or other conditions altering its course.

“*Manila.*—*The Amigo del Pais*, December 14th, 1845, contains an official notice of the loss of a foreign vessel on the coast. The communication states that on the 9th November was reported by the *Mauanian*, the loss of the Bremen brig *Express*, 460 tons, which went on shore during a gale of wind and became a total wreck. There were on board Captain Henry Hackfield and ten men including the supercargo, Mr. Edward Vischer. The cargo consisted of Sapanwood, Gold, Sycee Silver and dollars, valued at \$80,000. The gale commenced on the morning of the 8th November, and continued until 2 P. M. of the 10th. By the timely assistance of the people at San Carlos, the whole of the cargo was saved. Her Britannic Majesty's frigate *Samarang* received the whole of the cargo on board and was to convey it to Manila”.—*Ibid.*

*Abridged Log of H. M. S. V. DRIVER.—Civil Time.*

Noon 6th Oct. 1845, in Lat.  $18^{\circ} 24' N.$ ; Long.  $127^{\circ} 30'$ . Steering to the E. b. S. with a fresh breeze (5)\* from the E. N. E.; Bar. 29.80; P. M. a heavy swell from the eastward, blue sky, cloudy and squally; 6 P. M. Bar. 29.75; at midnight wind N. E. (10) blowing a gale, vessel steaming to the E. S. E.

7th October.—A. M. Steamer hove too with head to the eastward.† Wind N. E. (12) 2 A. M. hurricane; Bar. 29.30; at 5 wind east (11) Bar. 29.25; at 9 S. E. Noon wind S. E. (11) Lat.  $17^{\circ} 22' N.$ ; Long.  $127^{\circ} 24'$  East; Bar. 29.50. Heavy sea running throughout; 4 P. M. to midnight S. E. (10 to 9).

8th October.—A. M. to noon wind S. E. (8) and a heavy sea; noon the same; Lat.  $18^{\circ} 18' N.$ ; Long.  $126^{\circ} 19'$  East. At night moderate and fine; Barometer 29.90.

*Extract from the Log of the Ship JOHN O'GAUNT—reduced to Civil Time.*

7th October, 1845.—Noon in Lat.  $18^{\circ} 40'$ ; Long.  $116^{\circ} 15'$  East; Bar. 29.65; wind E. N. E. and steady; at 11 P. M. wind N. N. East, heavy squalls.

8th October.—5 A. M. heavy gale, north. 10 A. M. the same, N. N. W. and tremendous sea; noon, Lat. D. R.  $19^{\circ} 3'$ ; Long.  $117^{\circ} 8'$ ; Bar. not quoted. P. M. hove too; wind N. N. W.

9th Oct.—A. M. Bar. 29.00. 5 A. M. wind west; head N. N. W.; Bar. falling; no position given. 1 P. M. wind shifted to southward and eastward, blowing with extreme violence; midnight gale unabated; Bar. 27.50, Simpiesometer 27.70.

10th October.—Noon heavy gale at E. S. E.; Barometer rising; Lat.  $20^{\circ} 53' N.$ ; Long.  $116^{\circ} 15'$  east.

*Extract from the Log of the Ship SIR ROBERT SALE. Civil Time.*

8th October, 1845.—At noon Lat.  $14^{\circ} 06' N.$ ; Long.  $114^{\circ} 15'$  east. P. M. wind N. W.

9th Oct.—Wind N. westerly and variable; Bar. noon 29.55; Lat. D. R.  $15^{\circ} 10' N.$ ; Long.  $116^{\circ} 06'$ ; P. M. shortened sail to close-reefed topsails. To 4 wind N. N. W. cloudy, gusty weather, with a heavy northerly swell; 5 P. M. west; 8 P. M. W. S. W.; 10 S. W.; midnight S. S. W.; 8 N. E. swell and a heavy westerly swell getting up; lightning to the S. E. and north.

\* These figures in the logs of H. M. Ships denote the force of the wind as marked according to Admiral Beaufort's table; 12, signifying a hurricane; I have added also the usual words.

† The wrong tack, being on the *right* hand side of the track of the Cyclone, the starboard tack should have been chosen.

10th Oct.—At 3 A. M. wind south, increasing to a strong gale with heavy squalls and rain. Noon, Lat.  $17^{\circ} 12' N.$ ; Long.  $117^{\circ} 58'$  east; Current S.  $39^{\circ}$ ; E.  $172'$ ;\* P. M. wind S. b. E. moderating; fresh and fine weather at midnight, with the wind S. E. and E. S. E. on the 11th, when the Lat. is supposed by Capt. Gribble to be about  $18^{\circ} 30' N.$

*Extract from the Log of the American Steam Barque EDITH. Civil Time.*

8th Oct. 1845.—6 P. M. off Pedra Branca.

9th Oct.—1 A. M. wind N. b. E., brisk gale. At 5 N. E. hard gale, laid too, head N. N. W.; P. M. N. E.

10th Oct.—Wind N. E., strong gale; 5 P. M. wind east; 9 P. M. moderate at S. E.; off the Ass's Ears. Minimum of Barometer  $29^{\circ} 65'$ . Drifted from Pedra Branca to the Asses Ears (drift of  $2\frac{1}{4}$  per hour.)

*H. M. S. AGINCOURT at Hong Kong. Civil Time.*

On 9th Oct. 1845.—Steady breeze (5) from the north and east with squalls.

10th Oct.—Wind north to noon, when force (8). At 4.30 P. M. Bar. falling to 29.76; struck lower yards and topmasts; wind N. b. E. At 6 wind E. b. N. Bar. 29.79;  $5\frac{1}{2}$  P. M. let go best bower and veered to 80 fs. on the small bower. To midnight wind E. b. N. Bar. 29.79.

11th Oct.—Barometer rising to 29.90; at noon 2 A. M. a *very* heavy squall with rain, wind east (8); 10 A. M. wind S. E. b. E. (7); P. M. weather becoming fine.

*Abridged Log of H. M. Brig ESPIEGLE.*

9th October 1845.—6.50 A. M. weighed and stood out of the Lema Channel; heavy sea from S. E.; wind N. N. E. (9). Bar. 29.87; Ther. 82. Noon. The Ninepin bearing West. Great Lema S. S. W. P. M. Increasing sea and Bar. falling from 29.85 at noon to 29.70; at midnight making all preparations for bad weather. Wind N. E. b. N. (10.)

10th Oct.—Hove too throughout with head to the Eastward. Wind N. E. (10 and 11.) At 10 A. M. taken aback in a shift of wind from S. S. W., but wind flying back to East† again, Bar. falling from 29.71 at 3 P. M. to 29.66 at noon; Lat. D. R.  $21^{\circ} 46' N.$ ; Long.  $114^{\circ} 35'$ ; P. M. soundings 32 per fm. mud. Wind E. S. E. (11) 4 P. M. East (10) to 9 P. M., when S. S. E. (11) Midnight 36 fm. mud and sand.

\* No doubt from the last observation on the 8th, this is 86' per day, or 3.3 miles per hour!

† This temporary shift from S. S. W. we can only account for by considering it as a local tornado within the main Cyclone, since the wind came back again steadily to the east, and is evidently part of the other ship's storm. H. M. B. being hove too on the wrong tack (for she was on the *right* hand side of the track, and should have been on the *starboard* tack,) was also the cause of her being taken aback. With her head to the Northward the S. S. W. shift would have been a quartering breeze.



11th Oct.—A. M. wind S. E. (11) Bar. 29.68; rising to 29.72 at 6 A. M. and 29.83 at noon, when wind about S. E. b S.; (9.) Lat.  $21^{\circ} 11'$ ; Long.  $113^{\circ} 30'$ ; current since 4 P. M. on 9th S.  $44^{\circ}$  W. 41 miles. Mainmast was found sprung; P. M. becoming gradually fine.

*Extract from the Log of the Ship ANN, of London, Capt. STEVENSON.  
Civil Time.*

On the 8th Oct. 1845 the *Ann* was in Lat.  $19^{\circ} 46' N.$ ; Long.  $114^{\circ} 36'$  East; moderate and fine, wind N. Easterly.

9th Oct.—A. M. light breezes increasing to strong breezes at noon, when cloudy and a heavy head sea. Wind N. N. W. Lat.  $19^{\circ} 24'$  North; Long.  $115^{\circ} 30'$  E.; 1 P. M. perceived a peculiar appearance of the atmosphere. The Barometers as usual, 30.00, and 29.80; had sent down small sails, &c. in preparation to beat to the eastward but not apprehending bad weather. Sunset increasing wind; appearance of atmosphere more settled and Barometer steady; at 10h. 30. Bars. fell two-tenths; ship standing to the E. N. E. under snug sail at 8 P. M. but gale increasing considerably reduced ship at midnight to storm sail.

10th Oct.—A. M. Barometers falling rapidly, 29.30 and 29.50. At daylight increasing to a Typhoon. Split and cut away main topsail, being unable to furl it. Ship under storm mizen. Noon Barometer 29.00 and 29.20; 1 P. M. 28.80 and 29.00. Under bare poles with a tarpaulin in the mizen rigging; 4 P. M. Bar. 28.50 and 28.70; gusts of wind and confused sea—fearful; 4.30 P. M. cut away quarter boats. At 5 P. M. Bar. 28.50 and 28.80, with an alarming appearance, ship lying with tarpaulins in mizen rigging with her head to the Eastward and drifting fast to the Southward.\* At 5.30 tremendous gusts with perfect sheets of foam all round, the spray sweeping over the mast-heads. The heavy seas that struck the ship and which we expected would make a clean sweep of the upper deck fore and aft disappeared over our heads like a sheet of lightning from the fury of the wind. At 7 Bar. 28.00 and 28.20; heavy rain. About 8 P. M. Typhoon moderating, sea in a more confused state. Ship labouring dreadfully; at 9 P. M. Typhoon fell suddenly light, and veered† to the S. Eastward; head from S. W. to W. S. W. rolling awfully, but Bar. still inclined to fall; did not venture to make sail. At 10.30 wind increasing from the S. E.; at 11h.20 every appearance of an approaching hurricane from the S. Eastward. During the lapse of 50 minutes the Bars. fell 0.3, and were now at 27.70 and 27.80. Midnight, Typhoon blowing with awful fury and the sea fearful in the extreme, washing away every thing before it. Fore topmast, jibboom and head of the foremast gone, which was not discovered till daylight.

\* The direction of the wind is not given, but from this it must have been about N. N. E.

† The Italics are mine; it might almost be called a *shift*.

11th October.—Daylight strong gale S. E. ; at 8 P. M. the same and less sea. Bar. 29.30 and 29.10, rising rapidly ; Noon, Lat. 20° 41' N. ; Long, 114° 30' East. After which fine weather gradually returning with Southerly winds.

The following notice from a Singapore paper does not afford us any assistance in tracing the Cyclone track, but it is always a lesson (if more are needed) to shew the mischief which is done by disregard or ignorance of the laws of our science. I have no sort of doubt that it was a part of the same Cyclone to which the preceding logs relate.

“The ship *Tyrer*, Ellis, which left China on the 9th October 1845, with a cargo of Tea, bound for London, arrived here on the 15th November, having experienced a very heavy Typhoon on the passage. We have received the following particulars of the voyage. The *Tyrer* left on the 9th ult. with pleasant weather. On the 10th at 4 P. M. commenced with small rain and wind increasing,—continued to blow very hard until 10 o'clock next morning when it blew a perfect hurricane, and the ship refusing to steer any longer broached to. During eight hours the ship was on her beam-ends, and blew away her jib booms, jib, fore royal-masts, two quarter boats, washed away all the bulwarks,—and a great quantity of sails, water casks, &c. went overboard :—every thing was cleared to cut away the masts in case the ship went any lower. When the ship at last righted she had three feet and a half of water in her hold. From 10 A. M., on the 11th until 8 P. M., the wind was from N. N. E. to N. W. The day after this severe storm four of the crew were seized with fever and ague—the next day 13 more were down, and ultimately for three weeks there were only five persons left in a condition to work the ship, viz., the Captain, two mates, the cook and the steward. We think great credit is due to Captain Ellis for the manner in which he brought his ship down under these circumstances. It is supposed that about one-third of the cargo has been damaged.”

#### REMARKS.

#### TRACK H.

I begin here, as previously explained, with the Cyclone of *H M. Steamer Driver*, which vessel seems to have had it on an average from N. E. to S. E. and to have been at 5 A. M. when nearest the centre, not far from her position at noon on the 7th, being hove too during most of the interval. With the best allowance I can make for her drift, not having the detailed log to refer to, I should allow for this Cyclone a track to the W. b. N. as I have marked it ; I do not connect the two tracks, as we have no authority for so doing.

## TRACK I.

The *John O' Gaunt* appears to have had the Cyclone commencing with her from North soon after midnight of the 7th, and by noon of the 8th, in Lat.  $19^{\circ} 3'$ ; Long.  $117^{\circ} 8' E.$ , it was a heavy gale at N. N. W. which would place the centre to the E. N. E. of that position and at a considerable distance, or moving down slowly, for the wind remained apparently at this point till 5 A. M. on the 9th, or for nearly 17 hours, when it is marked at west, the centre not being far to the northward, for at 1 P. M. it is said the wind *shifted*\* to the south, and by the following day, the 10th, it had veered to E. S. E. when the Barometer was rising, so that the vessel was apparently drifted far to the northward and the Cyclone was passing her slowly without much southing in its track. But the notes obtained are unfortunately very meagre, as the logs probably were, and in the absence of the log we can deduce little but estimates. The two notes I have of this vessels log also disagree, so far as can be made out, in dates, which adds greatly to the difficulty.

The *John O' Gaunt* is the only vessel from which we can fix the bearing of the centre of the Cyclone approximately on the 8th, and on the 9th she was very near the *Ann*, with which vessel it did not commence till the afternoon or rather night, though it was certainly *seen* approaching her soon after noon, by the "*peculiar appearance*"† noted in the log. It is evident from the position of these ships that the Cyclone was not one of any great extent, for they were at most, and with every allowance for errors, not more than 100 miles apart on the 9th, when the *John O' Gaunt* was close to the centre, having the shift at 1 P. M., while the *Ann* was just remarking the peculiar appearance quoted above.

Hence we cannot include the gale experienced by H. M. Brig *Espiegle* and the *Edith* on the coast, and by H. M. S. *Agincourt* at Hong

\* These words *shifted* and *veered* are used so indiscriminately that we can deduce nothing exact from them, unless we are told from which point the shift took place. If it was at once a shift from West at 5 A. M. to South at 1 P. M., this would indicate a very slow motion of the Cyclone, or that the ship was carried along with the storm wave to the Westward faster than she drifted to the Eastward. All we can conclude is that from 5 A. M. to 1 P. M. she was very close upon the centre.

† It is to be regretted this peculiar appearance is not more accurately detailed. One of the greatest services seamen can render to science and to each other is to give exact and full accounts of all these phenomena.

Kong, as parts of the same Cyclone, the *Espiegle* being at 260 miles distance from the *John O' Gaunt* to the N. N. W., and the *Sir Robert Sale* 240 miles to the S. S. W., and thus far out of the utmost verge we can suppose for the outer storm circles. The fact of these gales occurring at the same time, and the direction of the wind with the *Espiegle*, being in accordance with the circle, would at first sight have led us to suppose that they really formed part of it, but the *Ann's* log, which appears from the extract made to have been perfectly well kept, is conclusive on this point. The easterly gale of the *Espiegle*, though veering from N. E. to S. East or through 8 points of the wind circle, we may consider to have been either the first efforts of the N. E. trade or that this and the *Sir Robert Sale's* cloudy and threatening weather on the 9th were parts of a Cyclone of larger diameter, which was not completely formed, its central part only being, as we have seen, with the *John O' Gaunt* and *Ann* in full action, and with the last vessel, of excessive violence, with a very remarkable fall of the Barometer at and near the centre. I should remark also, by the way, that we have as yet no instance of the Cyclones of the China sea extending to 600 miles in diameter, and this is certainly not one.

I have then laid down the track from the logs of the *John o' Gaunt* and *Ann* alone as being one *about* from the East  $\frac{3}{4}$  North to the W.  $\frac{3}{4}$  S. It may be somewhat more or less of course, the exact position of both vessels being uncertain, but this is probably nearest the truth.\*

#### TRACK I.

##### *Manila Typhoon of November, 1845.*

I have no further notice of this cyclone than the following, from the *Singapore Free Press* :—

“By the *Caroline* from Manila accounts are received from the Manila papers of a severe gale there. It grew dark on Monday the 2d November,† 1845, with very dark murky weather and a fresh breeze from N. E. changing to N. N. E., East and S. E. at which it rested at 3 in the morning. The force of the tempest was from 10 o'clock on the 3d. The bar. fell 75 centesimals. Almost all the ships in the Bay dragged; the American ship *Camera*, which left on the 2d re-

\* In the Chart to the Sailor's Horn Book, this track has a more Southern direction, being to the S. W. b. W. from the N. E. b. E. owing I think to oversight in the dates when laying it down for that chart without any Memoir.

† Supposed Manila time, or 1st Nov. European.



turned on the 3d before having left the Bay, with loss of her three masts ; *Balcarras* and *Flecha* cleared out on the 2d. They arrived safely at Singapore."

If we take the shift here to have been from N. N. E. to S. E. this will give us a track of from the E. b. N. to the W. b. S., or it perhaps curved a little more to the southward on its passage, as the entrance to that large Bay would lead it to do, but it might thus become outside a Cyclone travelling from N. E. or N. E. b. E. If we could obtain well authenticated registers of winds in such positions both within and at the bottom of deep bays and gulfs over which Cyclones are travelling, and then accounts of their tracks outside, we should be able to speak of these changes of tracks with more certainty. On shore, valleys and ravines seem certainly, as it were, to lead whirlwinds to prefer the lines of their direction.

1846.

#### TRACK J.

##### *Typhoon of the H. C. Steamer PLUTO, June, 1846.*

This Steamer was bound from Hong Kong to join Rear Admiral Parker's force at Labuan, on the coast of Borneo, when she ran into the Cyclone, in which, as will be seen, she was so nearly foundering. Her log was forwarded to me by the Superintendent H. C. Marine at Calcutta, and I have obtained also some other documents enabling me to trace accurately the track of the Cyclone, and to demonstrate very clearly the grievous error which had been committed. I deemed it right to address the Government of India through the Superintendent, pointing out this error, and it has done me the honour to lithograph my letter and chart for the instruction of the officers of the Indian sea-going Steam service. The lesson it affords may be useful in other parts, and as my letter comprises at once the abridged details of the data, and the summary of them, I have preferred printing it nearly at length. The sketch chart on which I have also marked the run of the schooner *Mischief*, the log of which vessel I give at the end, will be seen on the large chart to this memoir. The following is my letter :—

##### *The Secretary to the Superintendent of Marine, Calcutta.*

SIR,—I have the honor to acknowledge receipt of your letter No. 3805 of 18th inst. giving cover to the log of the H. C. Steamer *Pluto* in the typhoon experienced by her in the China Sea in June 1846.

It is at all times an invidious task to expose professional errors, but it is one essential to the interests of science, of humanity, and of the public service, when these involve not only great and useless pecuniary loss, but imminent risk of life and property, and possibly great detriment, amounting even to partial failure, of warlike operations. Such errors are moreover by so much the more mischievous when they are committed in the face of knowledge now within every seaman's reach, and in a quarter of the globe where, so to speak, the storms have been tracked with mathematical accuracy through a long series of years from 1780 down to the present time.\* The very newspapers in China refer at once to the Law of Storms to explain their tyfoons whenever they occur !

But I deem it my duty, Sir, to point out, what cannot have escaped you, that the H. C. Steamer *Pluto* on this occasion steamed as wilfully into the heart of a Tyfoon as if she had been sent out to experiment upon them ; and that heaving to for six hours, or making a curve in her course not amounting to 100 miles of direct loss on her track, would have fully and completely saved her and the Government from all the loss and danger she has suffered, and left her services available with the Admiral.

I proceed to shew for the information of Government, by whom I trust this letter may be forwarded to the Admiral, how this has been done.

My documents are :—

a. Log of the *Pluto* as forwarded by you, which is however imperfect, for it is a copy of the remarks mostly ; the courses and distances steamed and the winds, being omitted ! (the detailed log was however subsequently forwarded by Admiral Parker.)

b. Private log of the chief officer of that ship forwarded to me by Capt. Johnson.

c. The Newspaper accounts from China, giving imperfect logs of the Brig *Siewa*, and of the *Nemesis* and *Pluto* Steamers with reference to that of the *Jane*.

d. The log of the Brig *Anonyma* obtained here by myself.

1. It appears that the *Pluto* left Hong Kong on the morning of the 27th June, and at noon on the 28th was (at A on the annexed Chart)† in Lat.  $19^{\circ} 49' N.$  ; Long.  $113^{\circ} 45' East$ . Her Barometer, which was at noon 30.00, had fallen by 6 M. P. to 29.90, and by midnight to 29.68, that is, it fell one-tenth in six hours from noon, and something more than two-tenths more in the next six hours ; and this was in the China Sea, in the tyfoon months, with the wind from the Eastward, or *against* the usual monsoon, and with as much of other appearances as rendered it quite a sufficient warning.

\* See " Storms of the China Sea from 1780 to 1841," by me. (Journal Asiatic Society, vol. xi.)

† See Chart to the present Memoir, on which, to the left, this sketch chart is placed.

*June 29th.*—The vessel appears to have steamed on as if wholly unconscious of any danger ahead, though the increasing gale must have warned them of it, if they did not believe their Barometer; and a reference to the Horn Book of Storms\* (p. 10 and 16 of the first, and 10 and 16 of the 2d edition) must have demonstrated to them beyond controversy that they were on the Northern side of the track of a tyfoon and steaming as directly as they could for its awfully dangerous centre! or in other words, placing themselves wantonly in a position in which the finest frigate in the navy may be blown over like a paper boat: and from which hundreds of well found ships have never escaped to tell their tale! and they were doing this with a deeply laden and encumbered vessel!

By half past noon she *had* steamed into the centre of the tyfoon, being at noon in latitude  $18^{\circ} 22' N.$ ; Long.  $112^{\circ} 48' East$ ; or at B on the chart. Her course made good was S. 32 W. 103 miles since noon of the 28th; her track is made curved on the chart to shew how she probably steamed and drifted.

It will be observed that between the first noted fall of the Barometer at 6 P. M. and this time Noon 29th, eighteen hours elapsed, and as during the last six hours she could have made but little way, we may fairly allow her to have run down at the rate of five miles per hour (or 90 miles of the 103) which she made between Noon of the 28th and 6 A. M. of the 29th; and that for the last 60 miles of this 90, or from *a.* (her position at 6 P. M.) to *b.* which we may estimate to be that of 6 A. M. we may fairly say she was forcing herself into mischief. The distance from *a.* to B also, or 70 miles, must be about the semi-diameter of the Tyfoon where violent. The sequel of this mistake, which might have been detailed and predicted beforehand, even if we had not another word from her, was the shift of wind to the S. W. and the remaining half of the Tyfoon which so nearly completed the *Pluto's* destruction.†

The *Siewa* was on the 28th, at Noon, in Lat.  $17^{\circ} 21' N.$ ; Long.  $113^{\circ} 38' East$ ; with a commencement of bad weather, increasing till the next day (wind not stated) when at Noon 29th she was in a full hurricane in Lat.  $18^{\circ} 8' N.$ ;  $112^{\circ} 32' East$ ; throwing cargo overboard, having thus committed on the opposite side of the storm the same error as the *Pluto*; i. e. ran up 78 miles to the N.  $53^{\circ} W.$  into the heart of it, for at 3 P. M. she was in the calm centre with a shift of wind to N. W. veering to the South West at midnight, when it began to moderate as the tyfoon was travelling from her. Her track is marked on the chart.

The *Nemesis* from Bombay is said to have been farther to the South, in  $16^{\circ} N.$  and to have first experienced the Tyfoon at 2 P. M. on the 28th, from the N. W., veering gradually to S. S. E. Her position is not given.

\* If they had it on board?

† She lost her funnel, rudder, &c. &c. and drifting back in an utterly disabled state, struck on the rocks of Hong Kong, where she was nearly lost.



The *Anonyma* on the 28th and 29th was running up to the N. E. b. N. and N. N. E.  $\frac{1}{4}$  E. from  $14^{\circ} 40' N. 113^{\circ} 15' E.$  to  $18^{\circ} 4' N. 114^{\circ} 57' E.$ , with a strong S. W. monsoon and gale, which latterly veered to the S. E. and S. S. E. with a heavy confused sea. I have marked part of her track, also showing that she ran up just across the track, and *behind* the storm which was tearing the *Pluto* to pieces.

The track of this Tyfoon appears to have been about from the S.  $30^{\circ}$  E. to the N.  $30^{\circ}$  W.

It is only necessary, Sir, to refer to the sketch chart annexed, to see in a moment, that, allowing the Commander of the *Pluto* to have acted from the praiseworthy motive of pushing on at all risks to join the Borneo force at the earliest moment, he took exactly *the only wrong method* to do so ! Assuming that at midnight 28th, or 2 A. M. on the 29th, when he could not have doubted that he was plunging into a Tyfoon, he had steamed away to the N. E. or within a point or two either way of it as might have been easiest for his vessel and engines, till his barometer rose again to 29.80 or 85, which is a safe altitude (and the Barometer will mark the distance made from the centre of the Tyfoons almost with the accuracy of a clock) and then have hauled gradually to the East, S. E., South and S. S. W., till on his direct course, he would have made about the dotted line on the chart, and not even have crossed the track of the centre for a long time, escaping thus the inconvenience of the heavy sea always found there.

I am enabled to set this error in the strong light of contrast, by adverting to a report which, under a general order from the Lords of H. M. Admiralty, has been sent to me by Commander Nevill of H. M. S. *Serpent*.

This vessel, with  $2\frac{1}{2}$  millions of Dollars on board, being the last instalment of the China treaty money, encountered off the Mauritius in February last all the signs of wind, weather and Barometer indicating her approach to a hurricane. *She hove to for six hours and allowed it to pass her*, and then, as I have indicated,\* when she bore up, crossed the sea left by the path of the centre, which was so heavy that every precaution was necessary to prevent her rolling away her masts ; but she lost nothing but the six hours run.

The difference between these two vessels is evidently, and in a word, that of management and mismanagement. Both were on important services (and the steamer had moreover the advantage of going in the direction she pleased) but the one accomplished her's in safety by due attention to the law of storms, and the other is crippled by setting it at defiance. I repeat that this may have been done from the most praiseworthy motives, but it has been altogether done the wrong way, and if, without being especially called upon, I step forward to expose the error, it is because I consider every Englishman and every sailor bound to point out errors of judgment which, however remotely, may in some cases seri-

\* Horn Book of Storms, p. 9.

ously affect life and property, and the safety and honour of our flag; and that I should ill return the assistance which I have received from the Honourable The Court of Directors in furnishing me with documents for my researches, did I pass over this most grave error in silence.

H. PIDDINGTON.

*Calcutta, 7th Oct. 1846.*

*Extract from the Log of the Schooner MISCHIEF, Capt. WHITE, from Hong Kong and Singapore, subsequently obtained. Civil Time.*

26th June.—Left Hong Kong, Noon, Lat.  $21^{\circ} 40' N.$ ; Long.  $21^{\circ} 40'$ . Bar. 29.42.

27th June.—Lat.  $19^{\circ} 16\frac{1}{2}' N.$ ; Long.  $112^{\circ} 5\frac{1}{2}' East$ ; Bar. 29.40. Ther.  $92^{\circ}$ . Squalls from S. to S. E. and a heavy swell from the South; 8 P. M. brisk gale S. E. Noon strong S. E. gale, a very heavy Southerly swell; unable to carry sail for it.

28th June.—Lat.  $17^{\circ} 39' N.$ ; Long.  $110^{\circ} 16' East$ ; S. East breezes abating and sail gradually made.

It will be seen on the chart that the *Mischief* crossed the line of the Cyclone's track about 36 hours previous to its arriving at her position, but that she distinctly felt the swell which the Cyclone was driving up before it.

#### TRACK K.

*Typhoon of the Ship HYDEREE, Capt. POWELL, 21st and 22d July, 1846.*

The *Hyderree* at sunset 21st of July, 1846, had the Grand Ladrone bearing N. b. W. distant 15 miles, in 17 fs. water, standing to the E. S. E. with the wind at N. E. increasing to a hard gale and very heavy high sea. Bar. 29.50; midnight 29.30.

22nd July.—At 2 A. M. Bar. 29.20; 4 A. M. 29.00; hard gale at east at 6 A. M.; daylight the wind fell light, Bar. 28.90, and some sail was made to keep the vessel from rolling. At 8 A. M. the wind was South but Bar. rising; at 9 S. E.; by 10 a heavy typhoon at S. E. ship on her beam ends; cut away the mizenmast and foretopmast, lost foremast head, cut away main topmast; decks being swept fore and aft; at 11 moderating; 3 feet water in the hold; Noon moderate but a heavy sea. The Barometer at sunset on the 21st July was 29.50; at midnight 29.30; 2 A. M. 29.20; 4 A. M. 29.00; daylight 28.90; after which it began to rise. The ship's position at sunset, when the gale commenced, was with the Grand Ladrone bearing N. b. W. distant 75 miles, in 17 fs. water. After this stood to the E. S. E. till the wind shifted at 10 A. M. and when the gale was over, had soundings 22 fs, Cow-cock Island bearing north, about 40 miles to

the westward of Grand Ladrone, where the ship remained three days refitting, the current setting W. S. W. the whole time, about two knots per hour.

It would appear that this Cyclone was a very partial one, for as I am informed by Captain Powell, ships at a short distance to the northward of the *Hyderee* had topgallant sails set. Nevertheless it is worth noting as being perhaps analogous to, if not of the same kind, as the Tornado Cyclones off the Coast of Ceylon, and near Cape Negrais,\* which are peculiarly dangerous on account of the little warning they afford, and their tendency to appear in fine weather, when ships are least on their guard against them. We have recently had an instance of their occurrence at the Sandheads, occasioning the loss of the *Barque Nussur*, with all hands on board.

The average shift being from East to S. E. would give a track to the W. N. W. from the E. S. E., but as we must make some allowance for the ship's drift to the southward during the first part of the Cyclone, I have allowed it one to the E. b. N.  $\frac{1}{2}$  N. which will not be far from a correct estimation.

#### TRACK J.

H. M. S. RINGDOVE, *Straits of Formosa*, Sept. 1846.

I have marked this as a Cyclone, H. M. S. *Ringdove* having had a severe gale on the 15th and 16th Sept. (force of the wind being marked as high as 10 and 11.12, being hurricane force) from the North, which after an hour's calm again returned at S. W., but in this last half both its duration and force were far less than in the first part, in which it was blowing for 27 hours from N. E. to North, with a force of from 8 to 11, falling a dead calm from force 10, whereas in the latter half of the Cyclone it was blowing only from force 4 to 8, and this for about 12 hours at most. This is partly accounted for by her bearing up and running to the North and N. E., which was directly out of the vortex, and partly no doubt from the influence of the coast of China, close to which she was. Nevertheless, these apparent anomalies or peculiarities, should be faithfully noted to aid us in future research.

#### *Abridged Log H. M. S. RINGDOVE.*

At Noon 14th Sept. 1846. Lat.  $24^{\circ} 0' N.$ ; Long.  $119^{\circ} 45'$ ; wind N. E. force (5); veering to North at 7 P. M. and from that time to midnight varying

\* Sailor's Horn Book, p. 38, Journal Asiatic Society, Vols. IX. and XIV.

from North to N. E.; and increasing in force to 9., or strong gale for a man-of-war; thick squally weather.

15th Sept.—Wind N. E. 8; at 6 A. M. North 9, and at Noon the same and 10. Lat.  $24^{\circ} 8'$  North; Long. by bearings of Chapel Island,  $118^{\circ} 35'$  E.; Bar. 30.10; 5 P. M. 29.80. Midnight 29.80; wind to midnight North; 10, ship's head to the Eastward, squally, cloudy, and rain.

16th Sept.—Wind N. b. E. 10, to 4 A. M. when it fell calm to 5 P. M. Breeze springing up S. W. misty and drizzling, which continued to Noon, when it was still S. W. 7, having been at 8 from 8 A. M.; Bar. 5 A. M. 29.63. At Noon 29.84; Position when in the calm and shift about  $23^{\circ} 42'$ ; Long.  $118.55$  East; P. M. wind S. b. E. force 7; weather still overcast and cloudy, but subsequently clearing up.

The shift of wind was from N. b. E. to S. W., which would give a track of from E. S. E. to the W. N. W. but with due allowance for the vessel's standing to the Westward, and drifting as she must have done to the Southward, we shall find that the average track would be about from the S. E. to the N. W., at which I have marked it. We do not know in truth, also, how much the track may have been influenced by the land, but for all practical purposes the estimated track will be quite near enough to the truth: for the essential question for the seaman in all narrow seas is to know if the tracks of the Cyclones lie across or directly through the channels.

#### TRACK M.

*H. M. S. AGINCOURT, Bashee Passage, September, 1846.*

I am also indebted for this log to Mr. Elliott, Master of H. M. S. *Agincourt*, who forwarded with it a sketch chart shewing very clearly that a Cyclone must have passed over or near to the south extreme of Formosa, of which the *Agincourt* had the southern quadrants only, while H. M. S. *Vestal* and *Dædalus*, which vessels parted company in the forenoon, and stood to the northward, had it much more severe. Their logs unfortunately have not reached me.\*

\* Probably under a notion prevalent among some Commanders that, unless a Cyclone amounts to a furious or damaging hurricane or typhoon, it is of no consequence, or useless to send us the details. This is a great mistake. Whenever there is anything *Cyclonic* in a breeze, I shall be glad to have details of it, and especially when other vessels have also felt it. A moderate Cyclone may be as instructive as the most violent one for the great object of tracing out the track at that season of the year.



*Abridged note from Mr. ELLIOTT'S letter, and the Log of H. M. S.*

#### AGINCOURT.

H. M. S. *Agincourt* was on the 14th Sept. 1846, in sight of Formosa, Ape's Hill bearing N. N. E. 100 miles; at 8 A. M. wind hauling from East to North and N. N. E. with fine weather and royals set; Bar. at 1 P. M. 29.86; at 5 P. M. the wind shifted to N. W. in a squall with rain; after which the weather became squally; at 6.30 P. M. calm, and at midnight a moderate breeze from the N. W. b. N. with a heavy confused swell from the E. N. E. but fine, and wind moderate, being marked as 5.

15th Sept.—A. M. swell continuing, Bar. had fallen to 29.83; made preparations for bad weather. At 6 A. M. gale commenced wind N. W.; at 7 it was W. N. W.; at noon, W. b. N., Bar. 29.48, ship having been standing to the Southward. At 2.30 P. M. S. W.\*; at 6 P. M. S. S. W. and at 7 P. M. South; Lat. at Noon was  $21^{\circ} 18'$  and Long.  $121^{\circ} 20'$  East; Bar at 9 A. M. 29.50 and at Noon 29.46; Ther.  $83^{\circ}$  at 1.30 P. M.; at 3.30 bore up, Bar. 29.63, and by 6 P. M. the Barometer was at 29.70; the North Bashee being in sight bearing S. W. 5 miles.

Mr. Elliott remarks that the E. N. E. swell was so heavy that it would not have been proper to run out against it. His sketch makes the track of the Cyclone to be from the E. N. E. to the W. S. W., in which I quite agree.

#### TRACK N.

#### *The MISCHIEF'S Typhoon of Sept. 1846.*

*Abridged Log of the Clipper Schooner MISCHIEF, Capt. WHITE, from Singapore to China. Civil Time.*

The *Mischief* was on the 23rd Sept. in Lat.  $17^{\circ} 4' N.$ ; Long.  $115^{\circ} 26'$ ; Bar. at 29.46;† Ther. 86; P. M. brisk Westerly breezes and threatening appearance to the West and N. W.; 3 P. M. wind hauled to the N. W., at night W. N. W. and N. W. and squally weather.

24th Sept.—Increasing; 2 to 4 A. M. much lightning N. E. to N. W.; 4, threatening appearance to the N. E. and N. W. Making preparations for bad weather; sharp squalls W. N. W. and N. W. Very wild upper sky, but Barometer steady at 29.94; at 10h.30 P. M. Ther. 84; heavy N. E. swell getting up from 11 last night, which continues; Noon blowing hard from N. W. with constant rain and squalls; Lat.  $18^{\circ} 54' N.$ ; Long.  $115^{\circ} 34'$  East; a current to the E. S. E. of

\* Mr. Elliott remarks, "At this time the Bar. rose 0.02 and fell again immediately."

† Probably an error of the copyist, as it was at 29.94 on the 24th.

30 miles since the 23rd. The Pratas bearing N. E. b. N. 126 miles : P. M. furious hard squalls from W. N. W. rain and a confused sea ; hove too at 8 P. M. till daylight, blowing furiously from the West and a frightful sea.

25th Sept.—Daylight very wild appearance ; wind coming round to the W. S. W., still blowing fearfully and sea dreadfully cross from the veering of the wind ; 8 A. M. wind S. W. ; Noon a hard Tyfoon from S. W. with a dreadful sea ; no signs of its clearing up. Weather so thick cannot see  $\frac{1}{4}$  mile all round ; Lat. Acct.  $19^{\circ} 22\frac{1}{2}$  ; Long. Acct.  $116^{\circ} 27'$  ; Bar. 29.16 ; Ther.  $84^{\circ}$ . Allowed  $18'$  E. S. E. and  $11'$  East for current and sea ; Pratas Shoal N. b. E.  $\frac{1}{4}$  E. 80 miles ; P. M. heavy gales S. S. W. with a tremendous cross sea breaking over the vessel fore and aft ; sunset very severe gusts ; no signs of a break in the weather.

26th Sept.—Constant passing sharp squalls and torrents of rain with a breaking sea ; appearances of a second gale, Noon Lat. Acct.  $20^{\circ} 28' N.$  ; Long.  $116^{\circ} 16'$  East ; Bar. 29.22 ; Ther.  $83^{\circ}$ . Allowed 30 miles N. E. b. N. for the sea ; Pratas Shoal N. E. b. E.  $\frac{1}{4}$  East 30 miles ; P. M. furious squalls from S. W. b. S. ; constant heavy rain and high turbulent sea. At 5 P. M. very severe ; sunset S. W., 8 P. M. perfect tyfoon S. S. W., ; 9.15. wind South\* to midnight.

27th Sept. A. M. wind and weather as above ; signs of a break in the weather ; 4 A. M. blowing very hard with torrents of rain. Daylight fearfully hard with very thick rainy weather and dirty appearances all round. At 8 the same ; at 9 a lull but very dirty still ; squalls and rain till Noon ; when a bright spot or two to the North, but no signs of a change ; Lat. by Acct.  $21^{\circ} 25' N.$  ; Long.  $116^{\circ} 22\frac{1}{2}$  East ; Bar. 29.22 ; Ther.  $81$  ; P. M. passing sharp squalls from S. W. and the same confused sea ; 4 P. M. gale abated a little with a clear sky to the W. S. W. and Northward ; at 6 steady hard gale from S. W. b. S. with a heavy sea and far from settled appearances to the N. E. and S. E. quarters. At 8 the same winds, drizzling rain and lightning from N. W. to N. E. and East, and a high sea on. Midnight threatening appearances from N. W. to East with continued lightning.

28th Sept.—A. M. Passing heavy squalls from W. S. W. with heavy rain and appearances of the wind coming from the N. E. ; the lulls between the squalls considerable. At 9 A. M. hard gale from the Westward with cloudy weather but sea decreasing ; Noon, gale and sea much moderated ; made sail. Lat. by indifferent observation  $21^{\circ} 42' N.$  ; Long.  $115^{\circ} 34\frac{1}{2}'$  East ; Bar. 29.28. Ther.  $81$ .

The following is extracted from the *Overland Friend of China* of Sept. 1846, and the Cyclones it relates to are doubtless one, or perhaps two of them connected with that of the *Mischief*, but I have been unable to obtain further details.

\* It is possible there may be some error of the copyist here, or some little aberration of the Cyclone track, but it does not affect the general result.



The *Apolline* from Tutacorin had severe gales about 70 miles outside the Ladrones on the 27th and 28th, but suffered no damage.

The *Stephen Lurman* put back having experienced a severe typhoon off Braco Point. It commenced on the night of the 26th and continued until the morning of the 29th. The vessel was twenty-six hours under bare poles, and was at one time within three miles of the land on a lee shore, but fortunately the danger was discovered in time to wear. There was a very high turbulent sea. She sprung her mainmast and lost some sails. During the height of the gale she had three feet water in her hold.

It is remarkable that in the storm experienced by the *Aqua Marine*\* the wind went round with the sun. In the case of the *Stephen Lurman*, it went round against the sun.

The *Amazon* encountered a severe gale which commenced on the 25th and lasted until the 28th September. She was then in between 19 and 21 degrees of N. Lat. and 116° and 117° E. Long. On the 27th the vessel was nearly under water. To ease her the mizen-mast and fore top-mast were cut away, the guns and all the deck lumber thrown overboard.

† The *Don Juan*, 28th September, at 10 P. M., lost main-mast off Amoy, the weight of the breeze lasted 12 hours, and shifted from S. S. E. to N. N. W.

*Kestrel*, from Lombok, has also been much crippled.

The H. M. T. S. *Sapphire*, reports the Admiral with part of the Squadron still at Chusan.

The H. M. Schooner *Young Hebe*, put back into Amoy, having lost two anchors in the gale of 28th and 29th ultimo.—*Overland Friend of China*.

#### REMARKS.

It would appear from this valuable note of the *Mischief's* log, which Capt. White has been good enough to render as perfect as possible for me, that the Cyclone had fairly commenced with her from the N. W. about noon of the 24th, though her Barometer was still as high as 29.94 at 10.30 A. M., but this has occurred before in the China Sea, and it even has remained high throughout the whole of a severe and undoubted Tyfoon Cyclone.‡ At this time then, noon 24th, we may allow the centre of the *Mischief's* Cyclone to have been bearing N. E. of her, and at no great distance, since by daylight on the following day it

\* I shall notice this vessel's storm separately.

† *Appoline* is probably meant here, and the ships were on different sides of the track of the Cyclone.

‡ See 6th Memoir, Journal Asiatic Society, Vol. XI. p. 690, remarks on the *Ariel's* Barometer.

bore North, the wind being about West and hauling rapidly to W. S. W. and to S. W. at 8 A. M. where it continues to noon. We have it thus between noon 24th and 25th coming down upon her from the N. E. and passing her close to the Northward of her line of drift. If we take her Bar. at 10h. A. M. of the 24th to have been within the influence of the Cyclone, we find that it fell (from 29.99 to 29.16) 0.78 in the 25 hours from 10h. A. M. to noon of the 25th, or at a mean rate of 0.15 per hour, which would give a distance at the mean of the time, or say at about midnight, of 50 miles only from the centre, and this I have taken as the best datum we have, though we cannot be assured that the fall of the Barometer was at a regular rate. The succeeding rapid veering of the wind shews however, as above remarked, that the vessel *was* very close on the centre.

We next find that from noon of the 25th to that of the 26th the wind, not hauling to the W. S. W. and S. W. and then gradually to S. E., which it should have done if the Cyclone had had a track to the S. Westward so as to have brought the wind to S. E. at about noon on the 26th\*, but that after coming to S. S. W. at P. M. on the 25th, it remains at that point and to S. W. b. S. at noon on the 26th, evidently showing that the centre was now bearing to the N. W. b. W. of the vessel, and had thus, from some unknown cause, curved away to the Northward and Westward instead of continuing its straight track to the S. Westward, for the whole of the day of the 26th-27th to noon of the 28th, we find that it continues at S. W. and S. W. b. S. though abating a little, the Barometer having risen 0.06 only on the 24th; not improbably from the influence of the coast Cyclone, of which we have the newspaper notice previously quoted, for we find that the threatening appearances continue with her from N. W. (her own Cyclone) to N. E., that of the coast of China.

On the 28th, though we find "the appearances were that the wind was coming from the N. E.," i. e. that there was probably a heavy bank in that quarter, yet the *Mischief's* Cyclone ended in a hard gale from the westward, gradually moderating after noon, but the Barometer between the 27th-29th rising 0.06 only, as before. I have laid down its track as curving away and travelling off to the N. Westward

\* For we have always the vessel's position carefully given, and moreover *worked up at the time*, which is far more to be depended upon than after estimates.

without any reference to this return of the wind to the W. S. W., and I now explain why I do so.

We have seen in the log of the 27th that the appearances were threatening from N. W. to East, and to N. E. on the 28th, and at noon on this last day the *Mischief* was only 93 miles S. W. b. S. of Braco Point,\* off which the *Stephen Lurman* experienced a typhoon between the night of the 26th and morning of the 29th, "the wind going round against the sun," and the *Appolline* had severe gales about 70 miles *outside*† of the Ladrões on the 27th and 28th.

The *Amazon* again had a severe gale from 25th to 28th, and from these provokingly vague notices (which look as if the ship's position was not known) we may guess that on the 27th she was in Lat. 20° Long. 116° 30' or thereabouts, but again at what hour of the 27th she was in distress we cannot say. At noon of that day the two vessels, *Amazon* and *Mischief*, were about 85 miles apart. Hence from all this we may deduce that it is probable, as it is certainly possible, that on the 28th the *Amazon* was nearer to the centre than the *Mischief*, and that the *Stephen Lurman's* Cyclone was a different one, which was passing down the coast of China from the E. N. E. and may probably have deflected that of the *Mischief*, and occasioned the W. S. W. gale with which her Cyclone ended. This is very vague, it is true, but we have no better data, and must wait to see if future experience will allow us to suppose that the track may even have curved more shortly to the N. Westward, which, were we to take the *Mischief's* log alone, we should infer it did.

### *The DON JUAN's Cyclone.*

If there be no error in the newspaper notice which I have printed at p. 31, this is a very remarkable instance of a Cyclone in the Formosa Channel travelling to the E. N. E. from the W. S. W. We have unfortunately no further notices of it, but I place it on the chart both as a new fact, if it is correctly reported, and because, as will be subsequently seen, I have in track T. the *Easurain's* Cyclone, a very remarkable but

\* The proper name I suspect. By the English, (see Horsburgh) it is usually termed Breaker Point.

† If this was a Ship from Singapore she was probably not far from the Meridian of the Grand Ladrone, but she may have been to the eastward and have partaken of the *Stephen Lurman's* Cyclone.

perfectly authenticated instance of a severe Cyclone off the south end of Formosa, also curving away to the eastward, after travelling up from the southward: so that this one becomes not so improbable when we consider moreover that the land of China and that of Formosa are both high, which may influence the formation and tracks of the meteors very considerably.

1847.

### TRACK P.

#### *Typhoon of the Brig GUESS, July, 1847.*

The following is a newspaper notice, altered from the *Singapore Free Press*, of Oct. 14th, 1847, to Civil Time.

“The following has been sent us from Amoy for publication. The *Guess* seems to have encountered a very severe gale:—

‘Extract from the brig *Guess*’s Log.—On the 19th July 1847, at noon fresh breeze and squally. Barometer falling to 29.50; at 2 double-reefed the top-sails and furled top-gallant sails. At 3 P. M. more moderate; wind N. N. W., out reefs and set top-gallant sails. At 4 P. M. strong breeze and a dirty appearance, in top-gallant sails and double reefed the top-sails. At 6 P. M. strong gale, squally, and looking bad, wind N. b. W., close-reefed the top-sails, handed square main-sail jib, and mizen; sea getting up and Barometer falling. At 8 P. M. wind North, Barometer 29.00;—an increasing gale attended with hard squalls and rainy dirty weather; handed the fore-top sail. Midnight, Barometer 28.50,\* wind North, blowing a strong gale; handed the fore-sail, brought the ship to under close-reefed maintop-sail.

20th. At 4 A. M. hard gale, attended with hard squalls and rainy dirty weather and high rough sea,—brig labouring heavily and shipping large seas fore and aft. At 6 A. M. still increasing and a dirty appearance,—down top gallant yards and mast; and made the ship snug. At 10 A. M. fore-topmast staysail blew away, ship labouring heavily; cut adrift 11 bales of Tinder from off the quarter and stern davits; at noon wind N. b. W.—Barometer 28.50 and falling, blowing a most terrific hurricane, brig laying down on her beam ends, lee side of the deck under water, labouring heavily, pumps constantly attended to, cut away foretop mast and carried away jib boom at the same time. Ship labouring heavily, working herself to pieces, cut away the lee bulwarks. For the preservation of the ship and the lives of the crew it was necessary to heave overboard all the passengers’ chests, baggage, guns, &c., from off the lee side of the deck. Brig on her beam ends labouring and shipping large seas fore and aft, washing every thing from off the deck. No observation.

\* Possibly 28.80?—H. P.



Lat. by acc... 20' 45' North.

Long. by acc. .... 115' 20' East.

P. M.—Brig laying too under close-reefed maintop-sail, blowing a most terrific hurricane, labouring heavily and shipping large seas fore and aft—laying down on her beam ends. At 2 P. M. wind N. b. W. to North—Barometer 28.40—close-reefed maintop-sail blew away; gale still increasing with very violent squalls, blowing feather white. At 4 P. M. Barometer 28.10, blowing terrifically with a high awful looking sea—ship labouring so heavily, that I momentarily expected to see the brig go down. At 5 wind hauls to N. W. At 6 wind West, blowing terrifically, attended with violent squalls feather white. At 8 Barometer getting up to 28.50—gale more moderate, wind S. W. occasionally hard squalls but not so violent; midnight moderate gale—ship rolling heavily; Barometer 29.00.

20th. Day-light strong breeze, passing squalls—set the fore-sail, and put the ship before the wind—wind S. S. E. Crew employed clearing away the wreck and putting things to rights about deck. Forenoon fresh breeze from S. S. E. and passing squalls and rainy; rigging jury mast—noon set all possible sail; fine pleasant breeze and cloudy. No observation for Chr. Barometer 29.70.

Lat. by obs... 20' 55. North.

Long. by acc. .... 115' 25. East.

H. BRISTOW, *Master*.

*Brig "Guess," Amoy, 14th August, 1847.—Singapore Free Press, October 14.*

The ship *Earl of Balcarras* was also just on the Southern verge of this Cyclone and running to the Northward towards it though she did not reach it in time, as will be seen by the following abridgement from her Log, reduced to Civil Time.

*The Earl of Balcarras*, bound to China, was on 19th July at Noon in Lat. 14° 19' N.; Long. 113° 27½ East; with a 7 knot breeze N. Westerly and cloudy weather. Course N. E. b. N. At midnight the same.

20th July.—A. M. a long heavy swell getting up. At 3 wind W. N. W. Noon increasing to a gale at West. From 5 A. M. course North. Lat. by Acct. 16° 32' N.; Long. 114° 19' E.; Bar. 29.46. Ther 85°. P. M. Fresh gale West, vessel making but one and two knots against a heavy sea till 9 P. M. At 4 P. M. Bar. 29.42; 10 P. M. 29.48; at 11, 29.50, and at midnight 29.50; wind veering to W. S. W.

21st July.—Gale moderating and at 9 A. M. marked Southerly. At Noon Lat. 18° 19' N.; Long. 114° 26' East.

The *Balcarras*' log we leave out of the consideration of the track of this Cyclone altogether, as though she was doing all she could to get to the Northward, the Cyclone had passed on ahead of her, its passage being faintly indicated by the fall and rise of her barometer.

From the *Guess*'s log however we can distinctly trace that it was one coming down upon her from the E. b. N., the wind being nearly steady at N. b. W. for a long time, till between 2 P. M. and 8 P. M. of the 20th, we find it veering from N. b. W. to S. W., or 11 points of the storm circle (Cyclone points) in 6 hours, or not far from 2 points per hour. It is thus clear that the vessel was drifted by the Northerly gale just out of the centre, though close upon its Southern border.

If, as is very probable (for mistakes in newspaper accounts of gales and hurricanes are constantly occurring) the height of the Barometer at midnight 19th,—20th, was 28.80 instead of 29.50, we may then, allowing it to have fallen regularly from 29.00 at 8 P. M. on the 19th to 28.50 at noon of the 20th, or 0.50 in 16 hours, say that its *average* fall was .031 per hour, and that at the mean time of this 16 hours, or at 4 A. M. on the 20th, the centre was thus about 225 miles from the vessel: and we find it was then “a hard gale.”

From this time, 4 A. M. to 6 P. M. of the same day when the wind was West and the centre therefore bearing due North of the Brig, are 14 hours. And if our calculation of the distance at 4 A. M. is correct it had then travelled the 225 miles in this time, or at about 16 miles per hour, which is not an excessive rate for the Cyclones of the China Sea. It will be observed however that this calculation depends on the typographical error we have supposed for the height of the Barometer at midnight. If at that hour it had really fallen to 28.50, as set down, this would place the centre at 10 P. M. of the 19th within 80 miles of the Brig, but we can barely suppose it moving so slow (for we have as yet I think nothing below seven miles per hour ascertained for the rates of travelling in the China Sea) that it would only reach the vessel at 6 P. M. on the 20th. If we calculate from the fall of 0.20 (29.00 to 28.80) which I suppose to be the true correction of the error in the midnight figures for the Barometer, this will give the mean distance of the centre at 10 P. M. on the 19th to be 175 miles. And as it reached the meridian of the vessel at 6 P. M. or in 20 hours, this was not quite at the rate of 9 miles per hour. Either calculation it will be seen is a sufficient ap-



proximation to the truth to put the seaman on his guard in full time. And I have indeed introduced it, both as shewing the necessity of frequent registry of the Barometer, and when possible, careful copying and printing of the extracts.

#### TRACK Q.

##### *H. M. Steamer VULTURE's Typhoon of October, 1847.*

I am indebted to Lt. Crawford Pasco, of H. M. Steamer *Vulture*, for this notice, which is both valuable and remarkable. It is valuable as shewing that on the Coast of Cochin China the Cyclones (in this instance at least) travel direct to the shore, as in the case of the Coromandel Coast, and it is remarkable as the only log we have of a Cyclone reaching this shore, though no doubt they must frequently do so. I copy Lt. Pasco's letter entire, and in the track laid down, I adopt that from his diagram. There is nothing in the Cyclone itself calling for any particular remark.

##### *H. M. Steamer "VULTURE," Whampoa, Nov. 25th, 1847.*

SIR,—In compliance with the request contained in your very valuable "Horn Book" of Storms, that you may be furnished with accounts of any storms which occur, I beg to transmit a few particulars of a typhoon, experienced by this ship between noons of 23rd and 24th October last, while at anchor in Turon Bay, Cochin China, Lat.  $16^{\circ} 07' N.$ ; and Long.  $108^{\circ} 13' E.$  of Gr., with a diagram annexed illustrating the same. Consulting your book at the time, and using the mean course and velocity of storms in October according thereto as data, I concluded a N. E. gale or strong breeze would be felt at Hong Kong about 6 P. M. of the 22nd, which on my return I found on enquiry to be the case, though its strength had not been sufficient to excite particular attention.

The following table of wind, &c. is copied from H. M. S. *Vulture's* log book.

The figures denoting the force of the wind, and the letters the state of the weather, are according to the abbreviations by Admiral Beaufort, now in general use in H. M. naval service:—

| Date 1847. | Time.     | Direction of wind. | Force. | State of weather. | Bar.  | Remarks.                                                                                                                                                                                                                                                                                                                                                                                 |
|------------|-----------|--------------------|--------|-------------------|-------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Oct.       |           |                    |        |                   |       |                                                                                                                                                                                                                                                                                                                                                                                          |
| 23d.       | Noon      | N. W. b. N.        | 5 to 8 | o. q. r.          | 29.65 | At about 3h. P. M. the moon's Perigee. On shore the tide rose so much as to destroy a large portion of native huts situated on the low country. The ship's position was quite landlocked and surrounded by high land, excepting in a Southerly direction, but none nearer than 2 or 3 leagues, except to the East, close under which she lay. Latitude 16° 07' N.; Longitude 108° 13' E. |
|            | 8h. P. M. | Do.                | 8      | o. q. r.          | .60   |                                                                                                                                                                                                                                                                                                                                                                                          |
|            | 10h.      | Do.                | 9      | u. q. r.          | .56   |                                                                                                                                                                                                                                                                                                                                                                                          |
|            | Midnight  | North              | 10     | Do.               | .49   |                                                                                                                                                                                                                                                                                                                                                                                          |
| 24th.      | 2h. A. M. | Do.                | 11     | u. q. r.          | .34   |                                                                                                                                                                                                                                                                                                                                                                                          |
|            | 4         | N. E.              | 11     | Do.               | .20   | At 6h. 50m. Full moon.                                                                                                                                                                                                                                                                                                                                                                   |
|            | 5         | Do.                | 11     | Do.               | .18   |                                                                                                                                                                                                                                                                                                                                                                                          |
|            | 6         | Veering Easterly,  | 10     | o. q. p.          | .22   |                                                                                                                                                                                                                                                                                                                                                                                          |
|            | 8         | East,              | 10     | Do.               | .42   |                                                                                                                                                                                                                                                                                                                                                                                          |
|            | 10        | veering S. E.      | 9      | o. q. d.          | .53   |                                                                                                                                                                                                                                                                                                                                                                                          |
|            | Noon      | S. E.              | 9      | Do.               | .55   |                                                                                                                                                                                                                                                                                                                                                                                          |

CRAWFORD PASCO,

Lieut. R. N.

TO HENRY PIDDINGTON, Esq.

Calcutta,

## TRACK R.

*Barques SWALLOW and ROB ROY's Typhoon of November, 1847.*

The Barques *Rob Roy* and *Swallow* were both dismasted in this Cyclone, which appears to have crossed the China Sea from the coasts of Luconia, about Point Capones, in a W. N. Westerly direction to Hainam.

The following notice is from a newspaper. I have no further accounts of these two vessels, and in the original, Laboan is printed for Luban, evidently a mistake.

The ship *Sea Witch* (from New York 14th August and Manila 24th instant,) has on board the crew of the ship *Ann and Jane*; that vessel having been wrecked on the Island of Luban on the 8th instant (1847.) She was from London for this port with a valuable cargo, all of which, with the ship, is totally lost. Two of the crew were drowned; and the remainder carried to Manila in a Spanish schooner, and from thence to Hongkong in the *Sea Witch*.

On the 24th instant an English brig was going into Manila dismasted.—  
*Overland Friend of China, November 28.*

The following is the log of the *Rob Roy* :—

*Abridged extract from the Log of the Barque ROB ROY, Capt. J. FRANCIS, from Singapore to China. Reduced to Civil Time.*

6th Nov 1847.—At Noon in Lat. Obs.  $13^{\circ} 51' N.$ ; Long. Chr.  $115^{\circ} 39'$  East; Bar. 29.8; Ther. 84 P. M. Light airs increasing to midnight to a steady fresh monsoon from N. E., N. N. E. and North.

7th Nov.—A. M. increasing breezes, and at Noon fresh gale N. b. W. and squally (from Noon of 6th a heavy cross head sea\* is noted) Lat. Obs.  $14^{\circ} 11' N.$ ; Long. Chr.  $117^{\circ} 45' E.$ ; Bar 29.5; Ther. 84 P. M.; wind N. N. W. to midnight, when under close reefs standing to the N. E. b. N. with strong gales and a high sea.

8th Nov.—A. M. strong gales N. N. W. increasing to hard gale N. W. at Noon; 9 A. M. hove too with head to the Northward; Lat. Acct.  $15.2 N.$ ; Long. Acct.  $113^{\circ} 37'$ ; Bar. 29.50; Ther. 82; P. M. wind N. W.; violent gale, confused high sea and torrents of rain; 4 P. M. shipped a dangerous sea which carried away all the bulwarks, the wind suddenly veering to S. W. and more moderate with a clear break in the sky.† Squared the yards and ran  $11'$  to the N. E. in two hours, under reefed foresail and foretopsail; at 6 wind suddenly veering to South and blowing a complete hurricane, tried to take in the foresail and topsails, but in the attempt they blew to atoms. Ship broached to and was apparently foundering. In attempting to cut away topmasts lost foremast, main and mizen topmasts. Ship righted with 5 ft. water in the hold, lost quarter boats, deck cargo, &c. Midnight blowing a typhoon with heavy rain. Ship lying too with head to the East and wind S. S. E. since 6 P. M.; Bar. 29.60 at 0.30 P. M. 29.50 at 4; and at 6 P. M. fell to 28.40; Ther 62.

9th Nov.—A. M. blowing a heavy typhoon S. S. E.; 4 A. M. gale taking off; 6 A. M. moderating to Noon with wind steady at S. S. E. Noon moderated and clear Barometer rising.

The following logs are abridged from the *Strait's Times Extra* of December 6th, 1847, and the dates are altered to Civil Time.

*Particulars of the Typhoon in the China Sea of Nov. 10th.*—In our last issue we announced the arrival under jury-masts of the *Swallow*, Captain Anderson,

\* Undoubtedly the seas of the outer storm circle and of the “wave of progression,” of the whole Cyclone travelling exactly towards the ship.

† Italics are mine. This is another case to those so often cited of the storm disk being seen through.

from Hongkong. The *Swallow* when in about 19 deg. N. latitude encountered one of those singular but destructive phænomena which have buried in the depths of the ocean so many lives. She appears to have had a very narrow and providential escape from foundering, having passed near the centre of the storm. Captain Anderson has obligingly favored us with the loan of his log book, from which some interesting particulars are here annexed :—

The *Swallow* left Hong Kong Nov. 7th and experienced fresh breezes from the N. E. with a somewhat unusually heavy sea. It was not however until the 9th that any change was observable in the atmosphere.

*Extracts from the Log of the Barque Swallow, Captain Anderson, from Hong-Kong to Sydney.*

Nov. 9th. Wind N. E. p. m. Cloudy with rain in all directions ; pumps kept going every hour. At mid-night wind increasing still from the N. E. with a more violent sea. At noon the sun was obscured : Lat. by account 18 deg. 40 m. N. long. by account 113° 0' East.

At 1 p. m. strong gale and a heavy sea—the latter making a passage over all. At 8 p. m. double reefed the topsails, the vessel at this time scudding before the wind and shipping heavy and dangerous seas on deck. At mid-night gale increasing ; the sea lashed up into a complete foam.

Nov. 10th.—At 4 a. m. shipped a heavy sea which swept nearly every thing off the decks, including water casks, spars, &c. At 6 the vessel was labouring severely, the sea making a complete breach over her, and threatening instant destruction, on each occasion taking away something from the deck. The cuddy cabins were now stove in, and nearly every thing washed overboard belonging to the passengers ; breaking through the hatch of the gun-room and destroying the stores. At 9 a. m. both quarter boats filled ; the long-boat, also the cook's house and remaining articles on deck were carried away by heavy seas ; it was now found necessary to cut away the boats from both quarters as the vessel was labouring much in consequence of their filling with every succeeding wave. At 10h. a. m. *it fell suddenly calm*, and continued so for about one hour, in which the wind flew round to the S. W. blowing stronger than before ; all this time the sea was foaming over the vessel, and the men kept constantly at the pumps. At 11 a. m. hove to and cut away the topsails from the yards. It not being possible to quit the pumps, bore up and hove to again at noon ; at this juncture the ship was on her beam-ends, her yard-arms in the sea : the ship became unmanageable. It now became necessary for the safety of ship, cargo and all concerned to cut away the main-mast, which was done ; the ship immediately righted and got before the wind, running before a heavy gale and tremendous sea, plunging the bowsprit under water.

Course N. by E., wind S. W. p. m., after clearing away the wreck of the mast and spars, all hands were again set to the pumps, pumping up sugar and



salt water and no signs of the vessel being in any degree relieved. It was deemed advisable to lighten ship, at 7 P. M. The people at the pumps nearly exhausted. At mid-night the wind moderated, but there was still a heavy sea. The pumps kept going.

*Nov. 11th.*—At 6 A. M. commenced to heave sugar overboard; the passengers all the time working at the pumps and assisting in every way in their power. At 10 A. M. the island of Tinhosa bearing about N. W., at noon kept away for the island for anchorage. At noon, the wind veered to the northward, when the ship bore up for Singapore, having hove overboard 1400 bags of sugar; still making as much water as ever.

*Nov. 12th.*—Course S. S. W. P. M. weather more moderate; all hands employed heaving cargo overboard to lighten the ship. About 2,000 bags of sugar were thrown overboard; at 4 A. M. secured a stay from the mizen mast to the fore-mast and set a jib. At 8 A. M. secured a stay from the mizen mast to the stump of the main-mast and set a fore-top-mast staysail.

*Nov. 13th.*—Moderate winds and clear weather. At mid-night the swell so heavy that the vessel made but little way through the water.

*Nov. 14th.*—Course S. E. Wind N. W. P. M. strong winds and cloudy. At 8 P. M. very gloomy weather; mid-night strong winds and rain—the sea rising. At noon Lat. by account 14 deg. N. long. 111 deg. 2 min. E.

*Extract from the Log of the ship General Wood, Captain Stokoe, from Hong Kong to Singapore. Civil Time.*

*Wednesday, Nov. 9th, 1847.*—At 1 P. M. moderate breezes and fine—weighed and made sail to Singapore.

At 4 P. M. Fresh breezes and cloudy; Barometer had fallen in the previous 24 hours to 29m. 75.

Sunset—Fresh breezes and cloudy, with a heavy swell from the N. Eastward; ship rolling heavily.

Midnight—Strong breezes and cloudy. Furled the mizen top-sail and reefed the jib.

At 4 A. M. 10th Noon Blowing hard from the E. N. E. and east with a high increasing sea, and threatening appearances in the weather; Barometer falling 29.63.

Daylight—Strong breezes and threatening appearances to E. N. eastward and Ed. with a very heavy swell on; ship rolling heavily at times; Barometer falling to 29.53 made preparations for bad weather. Fresh gale veering to eastward.

At 11 a fresh gale from the S. eastward with a high sea on; ship rolling and straining heavily.

Noon gale increasing at S. east; with threatening appearances.



A strong gale from the S. east with a very heavy sea on ; sent down topgallant yards, and housed mizen top-gallant mast.

At 6 P. M. same wind and weather ; ship labouring heavily and making more water than usual. One pump at work.

At 8 increasing breeze and ditto weather.

At 10 30, Barometer rising 29'. 64.

At 11 30 saw land bearing N. N. W. supposed to be Tinhosa False.

Midnight. Wore ship and set jib, mainsail, and close reefed mizen top-sail.

At 2 A. M. 11 gale decreasing with less sea on.

Daylight—Fresh breeze and cloudy ; weather clearing up a little ; Barometer 29.70.

At 9 hours 30 Mount Tangeon bearing N. N. W.

At 10 hours decreasing breeze and fine.

Noon—Decreasing breeze with a heavy swell on. Mount Tangeon N. W.  $\frac{1}{2}$  W. Lat. by obs. 19 deg. 16 min. N.

The size of the typhoon of November 10th, appears to have been 150 to 160 miles in diameter. For, assuming the *Swallow* at 10 A. M. to have been near the centre, the *General Wood* was about 70 to 80 miles distant on its northern or north-western limit. We learn from Captain Burn, of the *Atiet Rohoman*, that on the 10th November he was to the northward of Pulo Sapata, with light S. E. winds and a very heavy sea from N. and Eastward ; so that, although the wind did not affect the *Atiet Rohoman*, the strongly agitated sea affords evidence that a disturbing influence was in operation to the N. and E. of the last mentioned vessel.

The following notice, also from the above paper, is the only one I have been able to obtain of the *Ardaseer's* share of the Cyclone :—

Since the above was in type, we learn that the *Ardaseer*, in her passage up the China Sea, on Nov. 8th, when in Lat. 15° N. Long. 119° E. encountered a severe typhoon which laid her on her beam ends, with all sails furled. The *Ardaseer* on the 8th was six degrees to the Eastward of the *Swallow*, so that it would appear the storm passed in the line of its track at the rate of about 200 miles in 24 hours. The *Ardaseer* was proceeding Northward so as to run away from the storm ; had she been passing to the S. or W. she would probably have suffered as severely as the *Swallow*—Editor.

#### REMARKS.

The *Rob Roy* does not appear to have had more than a fresh gale at Noon of the 7th, but at midnight we may consider her as fairly within the outer circles of the Cyclone, having the wind at N. N. W. and its centre therefore bearing from her E. N. E. She may have been at

this time in about Lat.  $14^{\circ} 30'$  N.; Long.  $118^{\circ} 17'$  East; and from this time to Noon of the 8th, when *Capt. Francis* places her in about Lat.  $15^{\circ} 12'$ ; Long.  $119^{\circ} 10'$ , she may have made an E. N. E. course good, or one directly towards the centre of the Cyclone, which, when close upon her, veered first to N. W. and then at 4 p. m. became more moderate, the centre having reached her so far as to place her as it were on its S. E. border with a S. Westerly breeze. She then ran up 11 miles to the N. E. but reached that part at which the wind was at South and blowing a hurricane.

This gives us an idea of what the size of the central space may have been. For if we suppose an octagon (S. West to South, being one-eighth of the wind circle) of eleven miles on each side, this will require a circle of 25 miles to include it. And we may take the *Rob Roy's* run to the N. E. as having been across one side of such an octagon. I have made no allowance in this for the motion of the Cyclone itself, which unless the ship was carried with it, would at least add ten miles more to this estimate.\*

But be this as it may, we can account very fairly for the wind's shifting now to a hurricane at South, by this run of 11 miles, and we must take the first shift of N. W. to S. W., though the last was not of full force, for the true index to the track at that time. If the ship had been lying to, the full tyfoon would doubtless have returned at S. W. or thereabouts.

But we have seen before that from the steadiness of the wind at N. N. W. till nearly Noon, it was at first coming down upon the vessel from the E. N. E. to W. S. W. It therefore by this time (Noon to 4 p. m.) was altering its track to the Westward. And as we find that the wind very soon became S. S. E., at which point the vessel being disabled drifting only, it ended also at S. S. E. we must allow that it now travelled away nearly to the W. N. W. or thereabouts.

The *Swallow* appears to have been at Noon of the 9th at about 400 miles to the N. W. b. W. of the *Rob Roy's* position of the 8th, with her Cyclone beginning only from the N. E., or we may say with the

\* Though 35 miles is a large estimate, we must recollect this was not the calm space, but the verge of it, when there was still a fresh S. W. gale. The large calm spaces are perhaps not so rare as we may suppose, and they account for ships lying so long in them, which occurs also when the Cyclone is a slow moving one.

centre at least 120 miles to the S. E. of her, and as at Noon of the 8th, we may call the centre of the *Rob Roy's* Cyclone about 30 or 40 miles to the West of her position, it follows that the actual distance between the positions of the two centres on these days was not more than 290 miles, which would allow a rate of 12.1 miles per hour for its progress on a W. N. W. course, which being both usual and probable, we may fairly and safely assume that it was the same Cyclone which, curving up to the W. N. W. as it cleared the mountains of Luconia, between Pt. Capones and Cape Bolinao, reached and dismasted the *Swallow* in consequence of her ill judged run to the Southward, travelling then, as will be seen by her shift of wind, to the N. W.

On the 10th, at 10 A. M. by the *Swallow's* log, its centre reached that vessel when she was about in Lat.  $16^{\circ} 42'$  Long.  $111^{\circ} 03'$ , so that it had not travelled up more than 130 miles in this 22 hours, or our previous estimate of the distance of the centre on the 9th was too small, or the storm was of larger dimensions, or it had slackened its rate of motion on approaching the high land of Hainam. If we take the whole time (46 hours) between the passage of the centre over the *Rob Roy* on the 8th, and this estimated position on the 10th, the entire distance between the two positions is 7 degrees, or 420 miles, which for 46 hours will give an average of 9.2 per hour, and if we adopted this rate throughout, it would place the centre so as to make the wind at Noon on the 9th, to have been about N. E. b. N. instead of N. E., which it may well have been, since the winds are rarely marked on board of merchant ships at busy and anxious times like the approach of a typhoon in the China Sea, with any especial care. We may also suppose, as this has been well authenticated in other instances, that as above stated, the rate of the Cyclone's motion to have been checked on its approach to the Coast of Hainam.

What is important however to our investigation is, that the Cyclone, which had probably a double curving, though the track is made strait on the Chart, is fairly traceable across the China Sea.

The log of the *General Wood* is too imperfectly given to afford any fair ground for comment. She was evidently to the Northward of the *Swallow*, and felt the N. E. quadrants of her Cyclone, but we cannot say at what distance, as her position is omitted.

The *Ardaseer* was evidently close to the *Rob Roy*, but we have not

even the wind in her notice, and thus it is again almost useless. It is scarcely necessary to add that both the *Rob Roy* and *Swallow* were dismasted through errors of judgment, but of different kinds. The *Rob Roy* might have ran down and hove too\* on the Southern, and the *Swallow* on the Northern sides of the Cyclone, with perfect safety.

(*To be Continued.*)

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*A narrative of our connexions with the Dusannee and Cheannee Garrows, with a short account of their country.—By Capt. C. S. REYNOLDS, Principal Assistant to the Commissioner of Assam.*

The Dusannee and Cheannee country, is bounded on the South-west by the Cullunkee river, and to the East by the Gograh river, which descends from the Garrow hills, and separates the purgunnahs of Mechpára and Caloomalooopára. To the South it is bounded by the country of the independent Garrows, and to the North by the last named purgunnah.

Although we have hitherto considered the Dusannee and Cheannee Garrows as separate tribes, I believe they are both one “Abengyas,” and that this distinction without a difference has arisen merely from the circumstance of their bordering on those portions of Caloomalooopára held by the ten anna and six anna sharers respectively. They consider themselves as one and the same people, and I doubt whether any of them have an idea why they have been called Cheannees and Dusannees, except perhaps those who border immediately on the plains. I was unable during my tour through their hills to discover that any line of demarcation had been laid down between the two mehaults by the former zemindárs, and indeed there was no necessity for any, until the estate of Caloomalooopára became divided into shares, which occurred at a time when the Garrows had thrown off even the name of allegiance to the zemindárs.

\* With a little more sea-room she might have run to the Southward till her Barometer rose a little, when the wind would, by the Cyclone passing on, have hauled rapidly to the West and S. W. and she might have made a fair wind round the Western quadrants of it. She unfortunately hove too in the direct track of the centre: a S. S. W. course, for a few hours would have given her good sea-room and the North-Westerly, Westerly and S. Westerly gales of the Southern and S. Eastern quadrants, with which, and daylight, she might safely have passed the Scarborough Shoal.



I can find no notice of the Dusanee and Cheannee Garrows until the years 1822-23, when they were first assessed at 196 Narainnee rupees, which was increased in the years 1824-25 to 200 Narainnee rupees, and under what circumstances this mehaul escheated to Government we have no records in this office to shew. I believe that like all other Garrow mehauls bordering on the lands of the Chowdries, it was formerly in the possession of the holders of purgunnah Caloomalooopará, which was sold in satisfaction of a decree, and the Garrow mehauls attached to it were retained in the hands of Government for political reasons, and on account of the oppression of the zemindars on the hill people. At this time the Garrows of Currybaree and other parts were in a state of revolt, and the purchaser was well contented to get rid of the Garrow mehaul which had been a source of much annoyance to the former zemindárs, without any gain.

Shortly after the mehaul came into our possession Mr. Commissioner Scott sent a party under the Garrow Serberakar Mirza Bundally Beg, to reduce the Garrows of this mehaul to order, as they had long thrown off any allegiance. This officer seems to have accomplished the object of his mission satisfactorily, as all the chiefs came in and made their submission, and agreed to pay the revenue, which was fixed at 196 rupees per annum, to be paid through the chiefs of each village.\*

The Dusannees however, do not appear to have been properly brought under subjection, for they continued to evade paying their revenue up to the year 1832, when their arrears amounted to 4979 N. Rs.† This circumstance, coupled with the Garrows of Rungtoopará having cruelly murdered four Burmese hunters who had proceeded far into their hills for the purpose of shooting wild elephants, led to a detachment being sent against them, with a view to cause them to surrender the murderers and to make them pay up their arrears. The force sent consisted of a company of Sebundies and 100 Burmese settlers at Singimaree, the whole under the command of Mirza Bundally Beg, the Serberakar. The party proceeded viâ Tikree Killa into the Garrow country to the east of the Dusanee mehaul, as it was thought that they would be able to get into the enemy's country with greater ease by that route than up the Rungi river. At Cherangiri, Mirza stockaded the party and commenced clearing a road towards Rungtoopará. The

\* The agreement is not to be found.

† See Appendix A.



working party was attacked by the Garrows, but the guard over it succeeded in repulsing them with some loss, that on our side being only 1 Sebundy and 2 Burmese killed, and 2 Sebundies and 1 Burmese wounded.

From Major Davidson's report\* it would appear that after the attack the chiefs came in and surrendered, and agreed to pay up their arrears, and as they affirmed that the murderers of the four Burmese hunters had been killed in the attack, a fine of 1000 Rupees was merely inflicted on the village of Rungtoopará for the crime committed. Although the chiefs entered into written agreements, they on one excuse or another evaded paying up their arrears and fine as agreed upon by them, and in the commencement of the cold season of 1834-35, Lieut. Brodie was deputed to make enquiries into the reasons for their not having done so, and also to bring them to order if necessary.

On the arrival of this officer at Bengal Katta, the chiefs of the lower portions of the mehaul came in and tendered their submission, but on making enquiries respecting the arrears of revenue, the ryots affirmed that they had paid in their rent annually to the chiefs appointed to collect it; and therefore they were no longer responsible for the amount claimed from them. On an investigation it was ascertained that several payments had been made by them which had never been carried to the credit of Government, and as the settlements which had been made with this clan appeared most defective and uncertain, it was deemed advisable to grant a remission for the past and to demand the arrears only for the current and preceding year. After some little trouble this was paid up, and also the fine levied on the village of Rungtoopará for the murder of the four Burmese. Lieut. Brodie, at the same time made arrangements that the revenue should no longer be paid through each chief, but direct to Mongring Luskur, who was to be considered responsible for the whole amount. The settlement was also made in Company's Rupees instead of Narainnee.†

After this settlement the Dusannees, although irregular in their payments, continued in tolerably good order until last year, when it became necessary to send a small party of sepoy towards Rissógiri with a view to the apprehension or surrender of the individuals accused of the murder of their chief and massacre of his family. Previous to this

\* See Appendix B.

† See Appendix C.

party being sent every endeavour had been made to induce the chiefs to surrender the murderers but without success, and it was supposed that the expedition of a small force would at once cause them to do so. The party proceeded through the Cheannee country, viâ Rampanee to Rissogiri, and at a short distance from the latter place, they were attacked by a large body of Garrows, who killed the interpreter and severely wounded the guide and one of the leading sepoy. The Garrows were repulsed, but the party was compelled to retire, as the revolt appeared of a very serious nature, but which I have reason to believe from subsequent information, was very much overrated at the time. The season then was too far advanced to commence any military operations, and therefore the only proceedings taken against the Garrows were increasing the guards at the foot of the hills, to prevent their egress to the plains.

In the latter end of November instructions were received to proceed against these rebellious people, and to bring them to order, and a detachment under Lieut. Belli was detached in the commencement of January for this purpose.

We left this on the 10th idem for Singimari, and reached it on the 13th inst. The intelligence I received on my arrival there was of a nature to make me suppose that I should meet with very serious opposition, I therefore determined to proceed at once to Bhogamara, a village at the foot of the route into the Cheannee mehaul, and after summoning in the Dusannee chiefs, should I find it impossible to bring them to terms, or they refuse attendance, to construct a road through the Cheannee country to Rissogiri.

My first interview was with the chiefs of Cheannee, who appeared unwilling to render me any assistance against the Dusannees, and indeed positively refused to help me in cutting the road. I used every endeavour to persuade them, but at the same time informed them they were liable to severe punishment for their contumacy, as every chief of a Tributary Mehaul (much less a Khass Government Mehaul) was obliged, under the agreement they had entered into, to render every assistance when occasion required. As I found that I could not induce them to join me, I determined to shew them that I did not need their assistance, and had demanded from them nothing more than they had stipulated to perform when first brought into subjection; I therefore gave them

their dismissal, and told them they should have no communication with me until I visited them in their own village, backed by the sepoy. The day after my interview, I commenced the road and placed the coolies under a sufficient guard to protect them against any attack, or surprize of the Garrows. On the evening of the first day at the conclusion of our work I was gratified by seeing waiting my arrival at my tent, three or four of the chiefs of the nearest villages, who had come to tender me their services, and that of their followers, and I willingly accepted them.

The next day they brought down 50 followers, and with their assistance we contrived to complete a very tolerable day's work. On my return towards camp I was met by several other chiefs who came to tender their services, and on the fourth day of our labour, there was not a single chief of the Cheannee tribe who had not subscribed his quota of workmen towards clearing the road.

On the evening of the 4th day of my work, I received intelligence from the messengers I had sent to the Dusannee Garrows that their chiefs would meet me at Bengal Katta for the purpose of making their submission, and I determined to proceed there without delay, leaving the construction of the road to Mirza Luskur and the chiefs of Rampanee.

I attribute the chiefs joining me so soon in the construction of the road after their decided refusal, to the circumstance of their seeing that I was determined to carry out my object, and also that if they wished they could not hold out when I had ready access to their villages and could with ease bring up my supplies.

The route from Bhogamara to Bengal Katta lies for the most part over low hills and swampy ground at the base. These swamps are caused by the flooding of the Jingiram, which leaves a deposit on the banks and consequently raises the land above the level of the surrounding country, and the drainage from the hills having no free outlet, the intermediate space becomes a mass of swamp incapable of cultivation.

With a little expense and judicious warping the whole of the country at the foot of these hills might be raised above the floods of the Jingiram, but at present it is a desolate waste. The exact boundaries of the purgunnah of Kaloomalooopára with respect to the mehauls of Cheannee and Dusannee has never been laid down, and wherever a ryot

of the plains cultivates the zemindár claims the revenue, although I am fully persuaded that he has no right to it. It appears to me an object of the first importance that these boundaries should be accurately laid down to prevent any future litigation.

About 6 miles from Bhogamara, en route to Bengal Katta, are the ruins of the palace and city of the Rajah of Bissondor, which, from their extent and numberless tanks still extant, must have been a place of no small importance in days long gone by. Not one brick now remains on another, of any building except two small Hindu temples, similar to those dedicated to Nursing at this place. They are still in tolerable preservation. Although I made every inquiry in the mofussil I could obtain no information respecting this place, except that the Rajah\* flourished long before the occupation of the country by the Moguls, and was a man of great wealth and power, who held the Garrows in complete subjection. I had no time to examine the ruins minutely, but it would amply repay the curiosity of any person who would do so. I merely mention the circumstance now, that any person who travels that route again may know that such a place is in existence, and had I been aware of it I certainly should have made arrangements for halting at Goalgunge to inspect the ruins. The route from these ruins continues over the same kind of country to Bengal Katta, which is situated on the banks of the Jingiram, and a little below where it is joined by the Rungi river.

*My interviews with the chiefs, and the result.*—I have already communicated in my letters Nos. 21 and 22 of the 29th January, and 3rd February last, and it merely remains for me to say, that having been assured of the good faith of the tribe, I had only to proceed against the rebellious village of Kissoogiri, the heads of which had refused all my overtures of pardon and forgiveness, if they would come in and surrender the murderers. I halted at Bengal Katta 5 days in order that the chiefs might clear the road I directed them to undertake, and on the 24th of January, it was reported ready, and we commenced our march accordingly, and reached Buldagiri the same day, when I received intelligence of the whole of the Kissoogirians having fled. I then

\* May it not have been the residence of Mansing, who was Governor of Bengal, and built the magnificent stone ghaut at Doobri, distant about 15 miles from this spot?



entered into certain arrangements with the chiefs, who consented to all I proposed, and also to bring to me the refugees of the village of Kisoogiri on the following day at Bengal Katta. As there was now no probability of our meeting with any opposition, I determined to return to Bengal Katta, and wait the result of my negotiations, which we accordingly did, and reached our standing camp the following day. After waiting the prescribed time, as the chiefs did not make their appearance, or send me any explanation, I determined to proceed at once, and make the enquiry myself, and this time not to stop short of Kisoogiri ; and on the morning of the 27th idem we commenced our march.

The route into the Dusannee country, and that by which all the Garrows of this mehaul descend to the Bengal Katta haut, lies from the latter place for the first two miles over a high plain to the Burmese settlement on the Rungi river. Marching along the west bank of this stream for about a quarter of a mile, you come to an extraordinary ridge of granite rocks, which rise like a wall out of the ground, and running across the road to the bank of the river seem to form a natural boundary between the hill country you are now entering and the plains you leave behind. The same extraordinary convulsion which threw up this ridge of stone, as if aware that such would be required, has cleft a doorway through it, which although narrow for elephants, is easily passed by any other laden animals. About  $\frac{1}{2}$  a mile up the same bank of the river the road crosses at a ford immediately below the first falls of the Rungi river, which are caused by another wall of stone similar to that just described, which runs completely across the river and disappears under the hills on either side. The fall however commences some hundred or more yards above, and the river is seen dashing and bounding along over every impediment, till it reaches the barrier, when with one mighty effort it leaps into tranquility below, from whence, as if tired and exhausted with its exertions through the hills, it winds its way quietly along till it finds repose in the waters of the Jingiram. The route now lies up the east bank, sometimes along the edge of the water through massive boulders of granite, and at others over the precipitous slopes of the little hills that restrain the course of this impetuous stream. The road never leaves the margin, except in one instance below Buldagiri, when it cuts across a promontory to save a considerable detour by the river. Our encamping ground was fixed on the west bank of the river



above Buldagiri, on a little hill cleared for cultivation. The village of Buldagiri is situated on the east bank of the Rungi, on a small piece of table land overlooking the river. It contains 13 substantial houses, and the population may be taken at an average at about 130 souls. The chief is a fine old fellow, and bears an honest countenance.

From our encamping ground the road laid along the western bank of the river for about a mile, where it makes a considerable detour to the east of the road, and we did not again catch a glimpse of its turbid waters till we reached Chitskiri. The road between Buldagiri and the above place was excellent, and a decided improvement on the river routes; no ridges of rock or high boulders obstruct the path, and so judiciously has it been chosen to avoid all abrupt ascents and descents, that you might almost fancy you were travelling in the plains.

The hills we passed over were covered with jungle, in all the different stages of Garrow fallow land. Low grass interspersed with old cotton plants, next rank Ooloany grass, thickly studded with quick growing shrubs and trees, and then the shrubs and trees grown almost into forest jungle. When the jungle has attained this growth, which it does in 7 or 8 years, the Garrows think the land has rested sufficiently, and recommence the labour of clearing for cultivation.

The village of Chitskiri, from which we encamped but a short distance, is prettily situated on the east bank of the river, but a few of the inhabitants have located themselves on the west also. Between these two places, for the convenience of villagers, one of those picturesque and useful rattan suspension bridges has been thrown across the river. I remarked several of them in different parts of the river to enable persons to pass over to their cultivations, which are frequently situated on the opposite bank to what the villages are. The old chief of Chitskiri I was much pleased with, and in cutting and clearing the road, as also bringing up provisions, I found him and his dependents most useful.

From Chitskiri to Rungtoopara there are two routes, one along the bank of the river, and the other over the ridge of hills, which the first passes under. The first is impassable for elephants and laden cattle, being blocked up with ridges of rock and boulders, between which only individuals can pass. The bed of the river is also impracticable, and Rungtoopara would be impregnable from this side, were it not for the route over the hill, which although a little abrupt, is still far from bad.

Descending to the bank of the Rungi it again falls into the old road, which continues along the margin to Rungtoopara. This is a superb village, or rather string of hamlets, which line both sides of the river for at least a mile and a half, and I should think they contain at the lowest computation not less than 1500 souls.

The chief of this village is Moonkual ; he has however, no real title to the distinction, but being a clever intriguing man, he has gradually usurped the authority of the old hereditary chief, who is in his dotage, and his heir and son-in-law being weak in intellect, the people have chosen for themselves a man capable of directing their counsels and managing them. They still, as a matter of form, submit any important subject for the consideration of the old chief, but I query whether his opinion is attended to when it is at variance with that of Moonkual. The power this man possesses over the people is astonishing. and his will is law. If we can secure his good faith we need fear no further outbreaks of the Dusannees.

As I intended to make Rungtoopara my head quarters during my residence in the Dusannee country I pitched our camp upon a hill at the head of the village, as it was admirably calculated for defence in case of any treacherous night attack, and a few sepoys would be sufficient to protect our baggage and standing camp when we proceeded against Ripoogiri. I obtained ready assistance from the villagers in erecting temporary sheds for the sepoys, and half a dozen stout fellows stepped forward into my tent and knocked up a Mechan for me to sleep on. As they were working with Lumbarees alongside of me I thought how easy it would be for any of them to settle my account and dash into the jungles, when they would never more be seen, but treachery of this kind forms no part of the Garrow character I believe.

From the top of the elevation we were on, the hills for miles around were cleared for cultivation, whereby we obtained a tolerable view of the surrounding country. At our feet ran the Rungi river, whose course we could trace coming from the south as far as Ripoogiri, a short distance from which it appeared to take a south-east direction towards some high hills, which I have laid down in the map. To the east 8 or 9 miles distant, the Tikree Doar hills rise abruptly above those of Dusani, which gradually decrease the farther south-west they run. Here and there the eye lighted on a small patch of cleared land, and denoted that a

village did not lie far off. By this I took the bearings of those places I have entered in the map, and much reliance therefore cannot be placed on their exact position, yet it will give a tolerably correct idea of the whole country. As far as the eye could reach to the south the hills appeared to be of the same uniform appearance as those we were on, and to have been at some time or another under cultivation ; amongst it we could discern several cleared patches pointing out the habitations of some of the independent Garrows. At the time I was making my observations the atmosphere, which is always more or less husky and obscure at this season of the year, was tolerably clear, and calculating that as a crow might fly I was then 25 miles from the plains, and that my visible horizon was limited to 15 miles beyond, my knowledge of the country may be supposed to extend half the distance across the promontory of the Garrow hills, yet I could discover no sterile precipitous rocky mountains which the Garrows wish us to believe are the features of the independent Garrow country, and I believe they merely do so to give us a false idea that the country is inaccessible. As far as I could see the hills presented no greater obstacles to the construction of a good road from Rungtoopara into the independent Garrow country than those we had already surmounted, through which as good a mail coach road might be constructed as through any of the mountains of Wales.

From Rungtoopara to Ripoogiri is a distance of six miles. The road winds along by the side of the Rungi river, and thence over a small hill till it meets the same stream a few hundred yards from the last named village. The lands for miles around had been cleared for cultivation, and our march was far more cheerful than any of the preceding, as we had a fine view of the surrounding country. I had heard that the Ripoogiri Garrows had barricaded the road in several places and planted it thickly with "Panjees," or sharp bamboo spikes, but as I could not find out the exact position of their ambuscades, I persuaded the Garrow chiefs who volunteered to act as guides to head the party and shew us the route, knowing full well that long before we reached these places that they and their followers would drop to the rear. They preceded the detachment about forty yards, marching in battle array. Each man armed alternately with a Lumbaree and bamboo shield, and spear and shield, and in the attack they form file, the latter fighting over the shoulder of the former. We had marched in this manner about 4



miles or more, when the leading Garrows shewed symptoms of uneasiness, and one by one gave up the post of honor, and at last they all came to a dead stand, and refused to advance any further. I then drew them up on the side of the hill, and the detachment stepped to the front, and commenced picking its way through the "Panjees" to the bottom of a deep ravine into which the road dived, and no sooner did the leading files commence the ascent on the opposite side than we were saluted with a shower of darts and stones thrown by a party of Garrows from behind a barricade across the road. The descent and ascent into and out of the ravine was through dense jungle, and we had no opportunity of getting a fair view of our enemies, but a couple of well directed volleys right and left made the place too hot for them, and the leading files having demolished the palisade we rushed through in pursuit, but the enemy had vanished. We then proceeded on to the village, which was distant from this spot about  $\frac{1}{2}$  a mile, where we expected to meet with serious opposition, but whether the Garrows had been more severely handled than they expected and had lost some of their leaders in our carrying their outpost, I know not, but on entering the village we found it deserted, although every preparation had been made for resistance. The village itself was stockaded and the only approach to it along the precipitous banks of the Rungi had been blocked up with felled trees, and the path planted with "Panjees" for a distance of 200 yards, and the side of the road inland for upwards of 40 or 50 paces. The "Panjees" we were compelled to shave off even with the ground, as they had been planted so deep that we could not extract them, and the trees we were obliged to cut to pieces and remove. I would suggest to any person who may go in command of a similar expedition, to take a small band of coolies to act as pioneers, equipped with "Doas" and "Kodals." In the present instance the sepoys had some Kookeries (Nepaul knives) and the party had been furnished with "Kodals," but if we had not been so provided we might have been detained some considerable time in getting to the village, as it was, we were an hour and a half getting over 200 yards of road. Every company of light infantry in this jungle country should be equipped with "Kookeries," which should be served out to them from Government.

As there was no hopes of inducing the people to surrender after the numerous proclamations I had issued to them, offering pardon and for-

givenness to all excepting the murderers, who would come in and give themselves up unconditionally, and as they appeared to me to require a severe example for their contumacy in attacking us, and also as my instructions did not warrant my detaining the detachment in these unhealthy jungles hunting a few individuals who might be apprehended by offering adequate rewards, I directed the destruction of the village and its defences, and after binding down the chiefs to seize and forward to me the offenders should they ever enter their respective jurisdictions, we commenced our retreat to the plains.

On our arrival at Rungtoopara, I regaled the chiefs who accompanied us with a good dinner, and lots of liquor, which they appeared to enjoy amazingly, but nevertheless "Moonknaal," the chief and his brother-in-law, although fond of a good carouse, came into camp at an early hour and slept there during the night, as in fact they had done since our arrival, as a kind of hostages for the good behaviour of their dependents. This they did of their own accord and not at my instigation.

The morning after our return to Rungtoopara we commenced our march back, and were honored by all the ladies of the different villages we passed through coming out to look at us, and although all the beauty and fashion of the Dusannee country was assembled, I must confess I never beheld such a horridly ugly set. The women labor as hard as the men, which of course gives them a coarse appearance, but still amongst the youthful I could not discover a single creature with even a pleasing expression of countenance. Their dress does not heighten their charms, which consists merely of a broad band of cloth encircling the waist and reaching half way down the thigh, the other portions of the body being entirely exposed. Round their necks they wear innumerable strings of brass knobs, not unlike the heads of children's arrows, and in their ears large brass rings of various sizes, and occasionally in such great numbers that the wearer is compelled to put a strap through them, and by passing it round the forehead, relieve the lobe of the ear from the great weight attached to it, and which would tear through, were it not thus protected.

The women are I believe chaste, and intrigues with them are generally punished in a summary manner amongst the independent Garrows. A man taken in open adultery, if not at once dispatched, is tried by the heads of his village and sentenced to pay a large fine in expiation



of his crime, but if it is not paid on the exact date, the injured man is considered at liberty to take the life of the adulterer whenever he can find opportunity. If a man succeeds in absconding for a time from the wrath of the husband, but is afterwards apprehended, he is tried as before, and adjudged to pay a fine of the same description, but of less amount than the former, in forfeiture of which the injured man is at liberty to wreak his vengeance on him whenever he is able.

This last fine is called "Gulla Bachana," and the former "Dhy," by the lowlanders.

The laws of marriage and inheritance are precisely the same amongst the Dusannee and Cheannee Garrows as the other Garrows, and by a reference to Mr. Elliott's and Lieut. Dalton's reports, an accurate and full account of them will be found. Respecting their religion I made no enquiries when I was on the spot, and therefore am unable to give any satisfactory information.

In their political relations I believe each chief is entirely independent, and governs his own dependants with the assistance of a punchyat of the heads of houses. In affrays of a serious nature, as in the massacre of the old chief of Ripoogiri, it is customary I understand for the chief in whose jurisdiction it occurs to invite the neighbouring chiefs to sit with him, and give him the benefit of their advice. In the event of an inroad from the plains I believe all join under the most substantial neighbouring chief to resist it.

We have been in the habit hitherto of calling on the Government Luskur of the mehaul, in which a murder takes place, to give up the offenders without any reference to the "Locma," or chief of the village to which the offender belongs. This I am persuaded the Luskur is in most cases unable to perform, as although he collects the Government revenue, he has no further authority than over the dependants of his own village, and the practice should be discontinued.

The cultivation of these hills is carried on in precisely the same manner as amongst the other Garrows. Their implements of husbandry being a hoe, a Doa, and a Lumbaree, but with these very inefficient tools a man and his wife are able to bring under cultivation between 3 or 4 biggahs of land annually, besides sowing, reaping, housing and carrying the produce to market. Their labor is unceasing, as the land is too poor to yield more than three crops, one of Assoo, one of cotton

sown with Khoni Dhan, and one of Assoo again. After this the land must remain fallow, until it is completely covered with tree and shrub jungle, which it generally is in 7 or 8 years.

The chief productions of the hills are cotton, Indian corn, Assoo Dhan, millet, chillies and yams. Cotton may be considered the staple product, and on it they are dependant for the other necessities of life their hills do not yield.

Although I made every search during my time for coal, limestone, and iron, I could discover none. In a little stream to the south-east of Bhogamara, I picked up some pieces of potter's clay; it was white and appeared of a good kind, but I could not discover the vein from which it had been washed. The Mundul of the village however told me that he could shew me any quantity, but I had not time then to accompany him.

At the foot of the hills, in the direction of the Rungi pass and Lamma Mitur hills, is a forest of Saul timber, which properly belongs to Government, but is at present disputed by the zemindar, and the case cannot be definitely disposed of, until the boundary between the estate of Caloomaloo para and the Dusanee country is laid down.

The trade with these Garrows is carried on entirely at the hauts of Bengal Kutta and Rajaballa, but I have seen some of the Dusannees trading as low as Pootemaree. Money is but little used amongst them, and the medium of their exchange is cotton, the indigenous production of the hills. In a year of scarcity, when the cotton is insufficient for their demands, they are compelled to extract from their hidden treasures a few "Korahs" or dishes of bell metal, which they sell, or barter for the supplies they require. Every substantial Garrow has generally a supply of these articles, which are considered heir-looms in the family, and are handed down from father to daughter, from generation to generation, and it is only in the event of dire necessity they ever part with them. These dishes vary in size and shape as much as the brass "Sooreahs" of the Bengalees, to which they are not dissimilar, the chief difference being that the rim of the latter is outside and that of the former inside. They are much prized by the Bengalees, and are purchased by them with avidity.

I have never been able satisfactorily to ascertain where these articles are manufactured, and where the Garrows obtain them from. The

Garrows themselves are unable to give any information on this point, and the general idea amongst the Bengalees is, that the Korahs are manufactured in Sherpore, zillah Mymensing, and are disposed of to the Garrows of that district, who again sell them to those of this. If this was the case the Bengalees could obtain them at a cheaper rate on the spot, than they can from the Garrows, and there would be no occasion to export them to Bengal, as they at present do from here, at least if the manufactory at Sherpore is still extant. Some of the Korahs are encircled with a band of embossed figures of men, women, and animals, which must have been moulded on at the time of manufacture. They are well executed and reflect the greatest credit on the state of the arts, wherever they are made. There is also a small kind called "Deo Korahs," beautifully embossed as above described, these the Garrows hang up as their household gods, and worship them. Should the possessor of one neglect to pay his accustomed devotions to it, and to sacrifice to it monthly a fowl, he is certain of being afflicted with some bodily ailment, and my informer told me that his mother was afflicted with an enormous tumour on her hip, in consequence of her neglecting to pray and sacrifice to it, but that after doing so, and promising a stricter attention to her duties, she was relieved; he told me he firmly believed in its power. If a person performs his devotions to the spirit which inhabits the Korah, with increasing fervour and attention, he is generally rewarded by seeing the embossed figures gradually expand. The Garrows believe also that when the whole household are wrapt in sleep that these "Deo Korahs" make expeditions in search of food, and when they have satisfied their appetites they return to their snug retreats unobserved. I merely mention these superstitions, as I do not see them alluded to by either Messrs. Elliott and Sisson, or Lieut. Dalton. I believe the Mirees have a superstition something similar regarding the "Deo Guntas," which are brought from Thibet.

Mr. Sisson says, the Garrows eat every description of animals but kites and jackals, and I have been given to understand that those of Dusannee and Cheannee are not more particular on this head than their neighbors. They are particularly fond of dogs, which are reared and sold by the Bengalees at the hauts in great numbers, and form a very profitable article of their trade. Their cooking is scanty, and the meat is often eaten half raw. The utensils they use in common are

small earthen pots, purchased in the plains, but on great occasions the Korahs above described are brought into requisition. On a journey and when travelling lightly the Garrows dispense with the cooking pot entirely, and use merely the joint of a bamboo, in which they boil their food.\*

With respect to the climate of this country, I ought not to speak unfavorably, for during my stay in it, I enjoyed most excellent health, but it is reported to be the most insalubrious portion of the Garrow hills, and Major Davidson, in an official report, states on the authority of Lieut. Whitelock, that out of 6 Europeans who entered it for only one day, 4 died.†

The inhabitants however do not shew any symptoms of living in a bad climate, and appear a very healthy, robust race. During our progress through the hills, however, I always took the precaution to pitch my camp on the top of some cleared hill, and I attribute the general good health of the detachment with us, and also of Lieut. Belli's and my own, to this circumstance. I have to thank Lieut. Dalton for the hint, who in speaking of the climate of the Garrow country, says, cleared spots are always to be found, and though water may not be near, it is better to suffer a little inconvenience on this account, than to put up for the night in confined vallies where the exhalations are deadly.

In conclusion I beg to annex a copy of the translation of an agreement entered into with the chiefs at Bengal Katta, together with a copy of the settlement made, by which the revenue has been increased from 136 to 306 rupees annually, and each village assessed as in mehaul Cheannee; also a list of the villages of that division.

P. S.—In the letter which accompanies this paper I have offered a few suggestions regarding the opening out of roads to connect our markets, and which I hope will eventually lead to a good one being constructed across the Garrow Hills into Zillah Mimensing, which, by causing a free communication with the plains on either side, would in my humble opinion more speedily conduce to the civilization of the Garrows than any other method that could be devised for the promotion of this desirable object.

\* As is commonly done by the Dyaks of Borneo.

† Vide letter 9th January, 1835, to Agent Governor General.



## APPENDIX A.

*Extract of a letter from Major DAVIDSON, Principal Agent Governor General, to CHARLES SMITH, Esq., Acting Agent Governor General, dated 14th Dec. 1833.*

*Para. 4th.*—The murder of the four Burmese is not the immediate cause of the necessity of making an incursion upon the Dussanee Garrows, it has been rendered necessary by insubordination which has existed for some years, and by their annually threatening to invade the lowlands about Singhermary and Curribarry.

*Para. 5th.*—The Burmese who have been murdered went into the Garrow Hills for the purpose of hunting elephants for the sake of their tusks, and their murder was not, till the receipt of Mirzá's report, known, as they had gone into the hills and were not expected back for some time.

*Para. 6th.*—Every measure will be taken to prevent the necessity of having recourse to firearms before they are made use of, and the murderers and revenue will be in the first instance demanded, but from the knowledge I possess of their character, I am satisfied these demands will not be attended with success.

I have, &c.

(Sd.) A. DAVIDSON,

*Princl. Asst. to Agent G. G.*

True Copy.

C. S. REYNOLDS, *Princl. Asst.*

*From Major DAVIDSON, to Capt. JENKINS, Agent Governor General, 15th Sept. 1834.*

*Para. 3rd.*—In reply to the first question in Mr. Macsween's letter, I beg to state that the acts of insubordination complained of consists in refusing to pay their revenue, murdering four Burmese who went into their country, and threatening to murder any person sent to demand revenue, and constantly threatening to burn the village and plunder the hauts on the frontier. No revenue has been paid to government by the Dusannees since 1829-1830, as reported to your predecessor by Captain Bogle, under date 15th July 1832, in the 19th paragraph of his letter.

True Extract.

C. S. REYNOLDS, *Princl. Asst.*



## APPENDIX B.

*To C. MACSWEEN, Esq., Chief Secretary to Government, Fort William.*

Sir,—I have the honor to report for the information of the Vice President in Council that the Dusanee Garrows of this frontier, reported in my latter of the 5th instant, as being in a state of insubordination, have been reduced to obedience.

*Para. 2nd.*—Under the authority of T. C. Robertson, Esq., late Agent to the Governor General on this frontier, I dispatched Mirza Bundally Surbrokar of the Garrow Hills to reduce the insurgent Garrows to obedience, and I regret to state the Garrows having made a sudden attack upon a party of Sebundies and Burmese who were guarding a party of 120 coolies employed in cutting a road through the jungle, our party sustained a loss of one Sebundy and 2 Burmese killed, and 2 Sebundies and 1 Burmese wounded. The Garrows were however repulsed after sustaining a loss of about 25 men.

*Para. 3rd.*—In consequence of the alarm created on the frontier villages I was under the necessity of requesting military aid from Major Monteith, commanding at Jamulpore, as reported in my letter of the 5th instant, who dispatched two companies under the command of Captain Marshall to Singheemary, but as the Garrows had submitted before Captain Marshall's arrival, I have requested that officer to return to Jamulpore.

I have, &c.

(Sd.) A. DAVIDSON,

*Princl. Asst. to G. G.'s Agent.*

True Extract.

(Sd.) C. S. REYNOLDS,

*Goalpara, 14th March, 1834.*

*Princl. Asst.*

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 APPENDIX C.

*Extract of a letter from Agent Governor General to W. H. MACNAGHTON, Esq. Secretary to the Government of Bengal, Political Department, Fort William, dated 21st, January, 1835.*

*Para. 3rd.*—I have to refer to my letter of the 27th November for my instructions ; I considered that the Dusanee Garrows were in arrears

of rent from short payments for several years, and that for their refractory conduct, and the expenses we were put to in the expedition against them in the years 1833—1834, they had been fined to the extent of 1000 rupees, besides having this against them, I conceived that the outrage some individuals of this tribe had committed in putting to death 4 Burmese hunters had been unavenged.

*Para. 4th.*—But it will appear from Ensign Brodie's letter of the 5th December that it seemed to be the impression that the fine had been imposed in satisfaction of that outrage, and that such had been the suspicious conduct of the immediate persons employed in the payment and receipt of the rents, that it was doubtful to him whether we had any just claims to arrears at all except for the past and current year.

*Para. 5th.*—Under these circumstances, Ensign Brodie proposed to limit his demands upon the chiefs to the payment of these arrears, and of the fine which were distinctly acknowledged, to I which of course assented; after some delay the whole of the fine has been made good and arrangements have been made for the payment of our rents by villages direct to our authorities, instead of through the chiefs, on whom there rests a suspicion of having appropriated a portion of the sums paid. The arrangements concluded with the chiefs by Ensign Brodie are contained in his letter of the 13th instant, and will, I trust, be approved by Government.

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#### TRANSLATION.

*A copy of an agreement entered into with the chiefs of Dusannee, at Bengal Katta.*

Your Lordship having arrived at Bengal Katta, in the Garrow country, we, the subjects of the Hon'ble East India Company, have written and subscribed to the following articles, for the purpose of shewing that we are certainly such, and should we ever act in opposition to the said articles we shall be liable to punishment.

*Article 1st.*—We agree to abstain from committing murder either in our own clan or in any other, or will we permit any amongst us to do so, or to commit any other heinous offences, that we may be able to prevent.

*Article 2nd.*—It was our former custom to hang human skulls in our houses. We hereby agree to abstain therefrom for the future.

*Article 3rd.*—All disputes which may occur in our jurisdiction requiring investigation, we will endeavour to settle with the assistance of a punchyat of 4 or 5 of the most influential chiefs amongst us, and in presence of the disputing parties, and should we be unable to settle it ourselves, we will report the same to the Hunt Mohurir, with a view to its being settled by your Lordship.

*Article 4th.*—When any officer or Government servant may have occasion to travel through our country, we agree to clear the roads in our several jurisdictions and to furnish him with coolies and render him every assistance in our power.

*Article 5th.*—When any officer or his deputy may arrive at Bengal Katta, and summon us to attend him, we will instantly do so, and if it is necessary for us to attend him at any other place we agree to do so on his summons.

*Article 6th.*—We agree to prevent any independant Garrows from entering the Government territories through our jurisdictions, with intent to murder or commit any other disturbances.

*Article 7th.*—When any officer or Government servant arrives at our Doar, we agree, on being called on, to pay without delay the revenue due by us.

*Article 8th.*—The road which has been cleared from Bhajamara to Kuntanangiri, and Bengal Katta to Ripoogiri, we agree to keep clear every year throughout our respective jurisdictions from 24 to 30 feet wide.

Signed by the Locma of RUNGTOPARA.

„	CHITSKIRI.
„	DERSEGIRI.
„	DUDINGIRI.
„	MAGULPARA.
„	DULIONGGIRI.
„	CHANNAPARA.
„	MORUNGIRI.
„	BULDAGIRI.
„	BOKONGIRI.
„	JUNGRAPARA.
„	CHERANGIRI.
„	DONGUPARA.
„	CHANNANGPARA.
„	NEJOGIRI.

True translation.

(Sd.)

C. S. REYNOLDS,  
*Princl. Asst.*

The undermentioned were not present, but they had previously made their submission to me :—

Doongrang, Locma of TEPATANGIRI.

Monka	„	RUNSEIGIRI.
Moonsing	„	CHAMPAKPARAH.
Tezing	„	KUNTANANGIRI.
Neusang	„	RUPOOGIRI.

*Census of Mehaul Dusanee.*

1.	Rungtoopara. ....	100 Houses.	100 Rupees.
2.	Repoogiri, .....	2	2
3.	Chetskiri, .....	20	20
4.	Dersegiri, .....	12	12
5.	Dudengiri .....	20	20
6.	Kuntanangiri, .....	7	7
7.	Magulpara, .....	10	10
8.	Dabougiri, .....	11	11
9.	Channapara, .....	7	7
10.	Morungiri, .....	20	20
11.	Buldagiri, .....	13	13
12.	Bokongiri, .....	12	12
13.	Jungrapara, .....	10	10
14.	Cherangiri, .....	14	14
15.	Ransagiri, .....	15	15
16.	Tepatangiri, .....	7	7
17.	Champakpara, .....	1	1
18.	Doongapara, .....	4	4
19.	Chanangpara, .....	12	12
20.	Negogiri, .....	9	9
		<hr/>	<hr/>
		306	306

The mehaul contains 306 houses of substantial persons, which may be estimated to hold 10 souls each—in population therefore 3060 persons of all ages and sexes.

*Names of villages in Dower Cheannee Garrow Mehaults.*

- |                      |                     |
|----------------------|---------------------|
| 1. Rabungiri.        | 14. Maudaparah.     |
| 2. Markhagiri.       | 15. Tangreeparrah.  |
| 3. Lengparah.        | 16. Juchaparah.     |
| 4. Kolaparah.        | 17. Bichdokparah.   |
| 5. Rakhoparah.       | 18. Khorchangparah. |
| 6. Khosurparah.      | 19. Malugiri.       |
| 7. Sindaparah.       | 20. Sangbuck.       |
| 8. Bindangiri.       | 21. Boreeparrah.    |
| 9. Runggoogiri.      | 22. Romogiri.       |
| 10. Boreeparrah 1st. | 23. Domreegiri.     |
| 11. Chomreekparah.   | 24. Ramrunggiri.    |
| 12. Dangrungparah.   | 25. Mansangiri.     |
| 13. Dingsaparah.     |                     |

*Visit to Dewangari.—By Lieut. E. T. DALTON, 9th N. I.*

I yesterday carried out my project of paying Dewangari a visit, and I must give you an account of my excursion.

On the 14th January, I halted at Soonbunkotta, from which I had been informed, I might go to Dewangari and return the same day, but when I declared my intention of proceeding next morning I was told it could not be done. The days being now so short, however I was determined on making the attempt, and sent up to tell the Rajah I was coming. We started at 8 A. M., and though on the preceding evening all were expatiating on the difficulties of the road, endeavouring to dissuade me from going, I now found all the villages and pergunnah authorities anxious to accompany me, and I had not less than a hundred followers, consisting of the Wuzeers of the Dooar Borkot and Sella, their Patwarees and Takooriahs, and a body of Cachari volunteers.

For the first two miles our route lay over a grassy plain partially cultivated by the Soonbunkotta villagers, which the Dia river in its various wanderings had strewn with large stones. A table-land rises from this, shewing a bold cliff towards the plain, and giving a breadth of from one to two miles of flat surface to the foot of the hills. At the



gorge of the hills through which the Dia, now a small stream, but a large and very mischievous one in the rains, emerges on the plains, we found the Bootia Chokey. This consisted of two or three huts only, but nearly as many hundreds of people, men, women and children, were here awaiting a favorable phase of the moon to proceed on their journey to the plains. There were besides these a considerable number of Boots and Bootnis, who make this their dwelling place whilst the intercourse with the plains is open, attending upon an official styling himself in parlance with me, the Deka Rajah, who sits here at the receipt of customs, levying tolls on the merchants, and assess from our ryots for cutting wood in, taking potter's earth from, fishing, or cultivating cotton in the Bootia territory. The Deka Raja was respectably dressed and very polite. He invited me to come up and sit in his office, which is a snug little boarded apartment looking out on the river. I had no time to spare, but I sat with him a few minutes to recompense him for the trouble he had taken in preparing a seat for me, a little platform covered with red cloth. He looked like a Chinaman without a tail, his head being close shaven. The road now lay up the rocky bed of the Dia, in crossing which I made use of an Assamese dola or trugon, which on the shoulders of Cachari bearers I found a very convenient vehicle for hill travelling, though I only mounted it when I should otherwise have been obliged to wait, as I could proceed more rapidly on foot. The river flows through a very narrow ravine, sometimes a mere chasm in the rocks, which rise precipitously on both sides. The descent is rapid, bringing down large boulders which considerably obstruct the road, but for a north bank hill highway I did not consider it a difficult one. The hills in the vicinity of the river are nearly destitute of fine timber trees, being mostly covered with grass, bamboos, and low shrubs. The pine apple tree (I forget the proper name of it) which I found in such luxuriance in the valley of the Soobunskeri is also here a leading feature in the landscape, and there are other palms. Leaving the main stream of the Dia to our left, we continued our march up the bed of its most easterly affluent. Its passage between the rocks was in some places only two or three feet in width, and the hills now rising high above us on both sides, keep this little dell in almost perpetual shade. About half the march was up this stream, and it is the worst part of the road. For the remainder, though the ascent is severer, the path

over the hill is wider, and free from slipping stones, and the country is more open. About noon we reached the first Bootia house, and shortly afterwards the temple, which, at least the interior of it, is worth more than the cursory inspection I had time to give it. It is a square stone building with gable ends and thatched projecting roof. The gable fronting the north has a verandah, or rather a projecting balcony of timber, behind which a well constructed frame work with several doors admits light into the temple. I was ushered in, and found in front of the window a highly ornamented altar, on which various utensils and offerings were placed in front of a recess, containing three large Buddhist images, all seated in the usual cross-legged attitude absorbed in heavenly contemplation. They appeared to be formed of clay, were exceedingly well executed and resplendent with gilding. The apartment before the altar, about 20 feet square, is boarded, and the walls are entirely covered with paintings of figures in similar penitential or devotional attitudes as those in the recess, but differently dressed. They resemble Chinese paintings, but I was assured they were the work of a village artist. If so, they are surprisingly well executed, the colours very brilliant and well chosen, and drawing tolerably correct; gilding was introduced to heighten the effect. My guides pointed out to me two sockets in front of the altar from which a pair of very handsome elephant's tusks that formed an ivory arch in front of the images have lately been stolen by some of our rascals, I make no doubt; I hope I shall be able to trace them.\* The Bootias hold this temple in too great veneration ever to have thought of committing such a (to them) sacrilegious theft. Being on the high road to Dewangari, it is well known to all our people, who come up here to trade; there is no house very close to it, and no one lives in it, consequently there was no difficulty in removing unseen any thing it contained; besides the tusks, some of the altar vessels were removed, "and the gods looked on all the time without doing anything to punish the marauders," innocently remarked my Bootia Cicerone, as if he considered that by far the most extraordinary part of the story.

A priest's house also of stone stands near the temple; it is two-storied, and with its projecting roof and balconies has rather a picturesque appearance. Of the other houses seen, some were of stone, some

\* The thieves have subsequently been caught and punished.

partly of stone and partly of timber, some all of timber. They had most of them rather a delapidated appearance, and several were wholly deserted. The temple is about a mile and a half from the residence of the Rajah. The path between appears to have been at one time lined with houses, but their sites are now overgrown with jungle, the former occupants having settled in our territories. The path from the temple winds along the northern face of a mountain, overlooking a valley, in which there is some appearance of cultivation. About half a mile from the temple we came suddenly on a stone obelisk built on a projecting spur of the hill, rounding which, a fine view was obtained of the Rajah's house and village. Several similar obelisks standing boldly out on the most prominent eminences formed a peculiar feature in the landscape. They are all of the same form—a square pedestal with projecting base, and cornice gradually diminishing from a height of six or eight feet, by steps, to the base of a globe, which is surmounted by a spire. I was informed that they were constructed entirely for ornament; this appears a degree of refinement to which we could scarce have supposed the Bootias had attained, yet their varied but always effective situations supported this motive for their erection. They had each a tablet with inscriptions, most probably in laudation of the person who built them. I had unfortunately no one with me who could read the Bootia character. The Rajah's house is situated on the ridge of a lofty hill commanding an extensive view of the plains of Assam to the south, and having a fine open valley with cultivation to the north. The village appeared to consist of but few houses, and these scattered and dilapidated, as if the proprietors cared little for preserving them. Whilst making a hasty sketch of the view from the obelisk, some of the Rajah's people, with caparisoned ponies and a mule came up, and one of these they insisted on my mounting. They also mounted my chaprassies and thus we proceeded to the Rajah's dwelling, and surrounded by a dozen wild Bootias, who held me on the poneys back, some by the legs, others by the tails of my coat, whilst they kept up an incessant exhortation to the animal in their own language, all of which they assured me he perfectly understood, to be careful how he stopped and proceeded. The vice-regal lodge is a large upper-roomed square stone building, with gable ends, a very low and wide doorway, and five large windows in a row in the upper story, four of which have projecting covered balconies



of timber. It gave me the idea of an old-fashioned farm-house, which after having been long deserted and neglected had suddenly been adopted as a place of shelter and placed in a state of temporary repair. The lower story, with exception of the great yawning entrance, is nearly destitute of apertures for the admission of light or air—in this respect resembling a block-house. I expected the Rajah would have come out to meet me, but this he did not do, and I for some time debated in my own mind whether, under such circumstances I should go to him. However as I had come to his village an unexpected and an uninvited guest, I decided that it would not be derogatory to my dignity to be conducted to his presence by the messenger he deputed for the purpose, and I accordingly entered the gloomy mansion. The ascent from the lower to the upper story is accomplished by means of something between a staircase and a ladder, which I had to grope my way up. The lower apartments, with exception to the hall are, I understood, only used as cells for prisoners, consequently the admission of light and air is a secondary consideration; at the top of the ladder however, I found myself in a well ventilated and roomy anti-chamber without furniture of any description, but in which the numerous attendants of the Rajah were demurely seated all round with their backs to the walls.

In the next room I found the Rajah seated on a small square platform covered with red cloth, very grave and grand, but very dirty, with legs crossed and arms folded, looking as like one of the figures of the immortals I had just been examining in the temple, as it was possible for a mere erring mortal to do. In a recess to his right there was a repetition of the gilded figures of the temple, which he said was a representation of the Dhurma Rajah. Before these the people, who were with me, connected with Dooars who knew the customs of this little court, made humble obeisances and one or two in the back ground, whom from having been formerly under him, the Rajah knew by name, he directed to do so, but he paid no attention to the nonconformity of myself and followers with the usage. For me an arm chair was placed, in which I seated myself without any ceremony.

The Rajah had before him a little low table on which oranges and other things fancifully arranged in the style of the offerings before the altars, were deposited, and on it several joss sticks were burning, which emitted an aromatic odour; before this table, as before the altar, a pan

of burning charcoal was placed, all I suppose emblematic of his being the representative of the Dhurma Rajah.

I forgot to mention that on my road up I met a messenger with a letter from the Rajah in reply to my missive of the preceding day, announcing my intention of visiting his village, in which he stated that if I halted at the boundary he would come down and see me the following day and arrange about my going up. I told his messenger I could not wait so long. He said there was no objection to my proceeding at once if I pleased; so on I went.

The Rajah opened the conversation by remarking that when *one great* man came to visit *another* due notice should be given in order that preparations worthy of the event might be made. However, as I had come to Dewangari in this off-hand manner, he hoped I intended to remain a few days, in which case he would be happy to entertain me. He evidently did not understand the visit, and hardly knew whether he should receive it as a compliment or otherwise. I believe I explained all to his satisfaction, for he ended by repeating his invitation to me to remain in a more cordial and pressing manner, offering to provide every thing for the whole party, and promising if the Dhurma Rajah permitted him, to come and see us at Gowhatty. We discussed other matters, but I found on political subjects he would give no opinion without receiving particular instructions from the Dhurma Rajah. The day was now waning and I rose to depart, promising to repeat the visit, if circumstances admitted of my doing so. I have no doubt I committed what was in their eyes a breach of etiquette in going up to Dewangari without having previously a long correspondence on the subject, but had I entered into this the Rajah would in all probability have, in selecting a lucky day for the event, have so put off the period of my visit that I should have been unable to go at all. Descending into the village I found the news of my arrival had collected together all the inhabitants, and a very little encouragement converted them all into most importunate beggars. Throwing a few small coin to some of the women, I was instantly surrounded and half-smothered by a mass of blooming Bootia beauties, pressing upon me for similar favours.

I use the word "blooming" advisedly, and not as a mere alliterative redundancy. The women have broad flat Tartar faces, small eyes, large mouths, noses short and low, not on the whole the most pleasing com-



bination of features, but many of them have fine plump rosy cheeks, healthy and pleasant to look upon, though the complexions, a light olive, have nothing in common with lillies. Their figures are concealed by the amplitude of their robes. They appear to take less care in adorning themselves than any Hill lasses I have met with. Their clothes are dirty, clumsily made, and awkwardly put on. Their tresses are generally left to float as nature pleases, though some few of the more tidy and respectable matrons had their's bound with a handsome bandeau of flat silver chains with a large ornament in front. Some damsels appear with shorn heads, and these I understand have all taken vows of celibacy. They are mostly widows, whose pretensions to virginity could not under any circumstances be supported, but some old women amongst them, with shorn heads, asserted their claim to the title.

I saw little cultivation, and excepting a few women weaving, no one appeared employed in any useful occupation. In weaving the women are seated on the ground. The web passes round three rollers of wood forming a triangle. One of these, attached by a leather belt to the woman, one supported on two posts in front of her, and the third pinned to the ground farther off. The woman by her position keeps the web stretched to the necessary tightness. The shuttle is a small hollow bamboo containing a roller for the thread. This she passes through the inclined web before her working upwards, and passing the woven part round below, until the whole piece completed thus comes round. The fine woollen cloths which the Bootias export are not made here, being brought from the interior. They are of very superior manufacture, resembling in pattern, material and softness of texture the Scotch tartans. The affection of all Hill tribes for plaids is singular; we have them all round the valley.

The cloths manufactured at Dewangari are of cotton or of erie. The latter brought from the plains.

The greater portion of the population of Dewangari consists of the Rajah's followers, or of traders, who make this their temporary residence for more convenient barter with the plains; the rajah himself is not above making money in this way;\* whilst he keeps back other

\* Every officer of the Bootan government is allowed a certain sum of money from the public treasury to trade upon, and which at stated periods he returns with interest.

traders on the pretence that the moon is not sufficiently old for their periodical migration, his own agents are allowed egress with Bootia cloths, which they dispose of before the market becomes swamped. Of "giris" or permanent householders, I was informed there are not now more than twenty about Dewangari, great numbers having deserted and settled in the Dooars. And as those who remain are subjected in consequence of the desertions to more than their former share of annoyance, they too are likely ere long to desert. I saw at Soobunkottah upwards of 60 Boots and Bootnis who had there settled; at Gooroo-gong, there are as many more; and they are settling in other places besides these two. They have not as yet taken up any land; and told me they had no intention of doing so, as they find they can push a very comfortable livelihood by trading. I told them I should tax them whether they cultivated or not. They were quite willing they said to pay whatever I imposed.

It was 2 P. M. before I got clear of the Dewangari village; we had the use of the rajah's ponies a part of the way; I believe he ordered that they should go with us the whole way, but his people made some demur and I sent them back, as I could get on just as fast on foot. We returned by the same road, and some of us got to the foot of the hills shortly after sunset, and I got back to camp at 7 P. M. Some of the party were not up till 9 P. M. It was a hard day's work.

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*The Pine tree of the Tenasserim Provinces. By the Rev. F. MASON.*

Some twenty years ago the residents of Moulmain were not a little surprised to find, among the drift wood of the Salwen, a log of some coniferous tree. This was the first intimation that any tree of the Pine tribe grew on the borders of these Provinces; but whether it were of the genus *Pinus*, or *Abies*, or *Larix*; a pine, a fir, or a larch, did not appear. It was several years after this occurrence, that one of our former commissioners told the writer he had offered a hundred rupees to any of the foresters who would bring down a spar of this tree. Spars have been, subsequently, brought down, but it is believed that Capt. Latter, the Superintendent of Forests in these provinces, is the first Euro-

pean who has visited the locality where the tree is indigenous, and from specimens of the foliage and fruit, which he has brought away with him, it appears to be a new species of *Pinus* that may be characterized thus :—

*P. Latteri.* Arbor 50—60 pedalis, cortice scabro, foliis geminis 7—8 ; uncialibus caniculatis serratis\* scabriosculo, strobilis and uncialibus ovato—conicis, squamis rombeis inermis.

*Hab.* In provincia *Amherst* : in convalli fluvii *Thoungyeen*.

*Descr.* A tree of from 50 to 60 feet high, or more, and from  $1\frac{1}{2}$  to 2 feet or more in diameter. Sheaths of the leaves arranged spirally, tubular, membranous, six lines long. Leaves two from each sheath, equal, from 7 to 8 inches long, acute with a sharp point, convex on the back, slightly scabrous with eight rows, in pairs of very minute thorns which produce a striated appearance, hollow on the under surface serrated cones ovate-conical, nearly four inches long. Scales rhomboid, unarmed.

The flower is unknown. A single ripe cone that had cast its seeds, and a small branch, being all the materials that have been furnished for description.

Specimens of the wood that have fallen under the writer's notice contain more resinous matter than any other species of coniferæ he ever saw. It appears like woody fibre immersed in resin. The Karens make tar from the wood, by a very simple process ; and large quantities of both tar and pitch might be manufactured in the forests, if a remunerative price could be obtained for the article.

This species has been named after Capt. Latter, as the discoverer, because all our acquaintance with the tree has been derived from him, beyond the vague knowledge that a tree of the pine family existed somewhere on the banks of the Salwen. He reports it as growing with the Engben, which is a species of *Dipterocarpus* that is met on the sandy shores of the Province of Tavoy, side by side with *Casurina muricata*. This Pine is not found west of the Donaw mountains, a part of an unbroken range of granite mountains that runs down from the falls of the Salwen to the old city of Tenasserim, and which here separates the valley of the Thoungyeen from the region watered by the

\* Lindley says of the order, "Leaves—entire at the margins ;" but these are certainly finely serrated ; and I find *P. excelsa* described with leaves "tooth-letted."

Gyne and its tributaries. In a note to the writer Capt. Latter adds : "In the valley of the Thoungyeen it is found growing on the raised central plateau of sandstone, mixed up with Engben trees, and in proportion as the elevation increases the Engben disappears. In the lower Thoungyeen, towards the remotest parts of the valley, it is found on ranges of hills west of Theglar river. These are its sites on the British side of the Thoungyeen. On the Shan side of the river, it is said to be more abundant, and appears to occupy the lower portion of the Tounngnyoo range, where the sandstone formation is more prominently developed. From the accounts of Burmese foresters who have seen the Pine forests on both sides of the river, the tree appears to be of a finer growth on the Shan side, than on the British, where trees are to be found of *nine* feet in girth and proportionably tall. I should say that on the British side of the valley the tree ranges at an altitude of 1000 to 15,000 feet above the level of the sea ; and that its latitude is about 17° north."

Possibly it may prove to be a known species ; but it is not among the *twenty-two* species described by Loudon as the denizens of Great Britain, nor among the *twelve* species described by Michaux in his "North American Sylva," nor is it either of the Indian species described by Roxburgh. Should it, however, be a species described in some other work to which the writer in these "outskirts of civilization" has no means of access, some of the members of the Society will probably be able, with this description and colored drawing, to point out the identity, and though then this note will be no contribution to science, it will still be a contribution to our knowledge of the resources of the Tenasserim Provinces.



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL

FOR JANUARY, 1849.

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The usual monthly meeting of the Asiatic Society was held on the evening of Wednesday, the 10th January,

The Hon'ble the President in the chair.

The accounts and vouchers for December were submitted.

*Mr. Wm. Macintosh*, Civil Architect, who had been duly proposed and seconded at the December meeting, was ballotted for and elected.

Read letters—

From Capt. Powell, Steamer “Precursor,” requesting his name to be removed from the list of members.

From the Hon'ble the President, forwarding a paper by Mr. Hodgson of Darjeeling on the Chepang and Kusunda tribes of Nepal (with drawing).

From the Hon'ble Mr. Bethune, requesting on the part of the Calcutta Public Library, to have a copy of the Journal, *Bibliotheca Indica* and other Oriental works published by the Society supplied free of charge. Ordered as requested.

From B. H. Hodgson, Esq. Darjeeling, a memorandum relative to the Seven Cosis of Nepal.

From the same—a Route from Kathmandu, the capital of Nepal, to Darjeeling in Sikim, interspersed with remarks on the people and country.

From the President of the Batavian Society of Arts, acknowledging receipt of the *Bibliotheca Indica* and of the Journal.

From J. W. Laidlay, Esq. V. P., &c. presenting, for the use of the Zoological Section, the sum of 500 rupees, due by the Society to Mr. Laidlay, for 100 copies of his version of *Fa Hian*. The thanks of the Society were unanimously voted to Mr. Laidlay for the above donation.

Also from Mr. Laidlay, Notice of a Chinese Geographical work.



From Dr. Aloys Sprenger, communicated by Mr. H. M. Elliot, a passage from Ibn Qotaybah's *Adab al Kâtib* on Arabic Astronomy.

From Messrs. Holmes & Co. presenting a copy of the *Bengal Biography and Obituary*.

From Professor Holmboe of Christiania, presenting specimens of the Norwegian coins of the present reign, and a bronze medal commemorative of the 25th year of the reign of Charles John. The thanks of the Society were voted to Professor Holmboe.

The Secretary read the Annual Report of the Council, showing the state and progress of the Society during 1848. The Report was unanimously adopted.

The meeting proceeded to elect office-bearers for the ensuing year. The results are given in the supplement to the Report.

The Curators and Librarian having submitted their usual reports, the meeting adjourned.

W. B. O'SHAUGHNESSY,

*V. P. and Secretary.*

#### LIBRARY.

The following books have been added to the Library since the 1st of November, 1848.

#### *Presented.*

Det Oldnorske Verbum, oplyst ved sammenligning med Sanskrit og andre sprog af Samme Aet. Af C. A. Holmboe. Christiania, 1848, 4to. (*Pamphlet.*)—BY THE UNIVERSITY OF CHRISTIANA.

Das älteste Münzwesen Norwegens bis gegen Ende des 14. Jahrhunderts. Eine Abhandlung von C. A. Holmboe; Christiania, 1847, 8vo.—BY THE SAME.

Traité de la Spéidalskhed ou Elephantiasis des Grecs, par D. Danielsson, et W. Boeck. Traduit du Norweigian, par L. A. Cosson. Paris 1848. 8vo. Avec un Atlas de 24 planches folio.—BY THE SAME.

Transactions of the China Branch of the Royal Asiatic Society, for 1847. Hongkong, 1848. 8vo.—BY THE SOCIETY.

The Bengal Obituary, or a record to perpetuate the memory of departed worth, being a compilation of Tablets and Monumental Inscriptions from various parts of the Bengal and Agra Presidencies. Calcutta, 1848, 8vo.—BY MESSRS. HOLMES & CO.

Astronomical Observations made at the Observatory of Cambridge by the Rev. J. Challis, Vol. XV. for the year 1843. Cambridge, 1848, 4to.—BY THE UNIVERSITY OF CAMBRIDGE.

The Oriental Christian Spectator for Nov. 1848.—BY THE EDITOR.

The Oriental Baptist, Nos. 24-5.—BY THE EDITOR.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the months of October and November, 1848.—BY THE DEPUTY SURVEYOR GENERAL.

Upadeshaka, Nos. 24-5.—BY THE EDITOR.

Tatwabodhini Patriká, Nos. 67-8.—BY THE TATWABODHINI' SABHA'.

The Journal of the Indian Archipelago, Nos. X. XI. and XII.—BY THE EDITOR.

Ditto ditto (2 copies).—BY THE GOVERNMENT OF BENGAL.

Fragments of an Oration against Demosthenes, respecting the money of Harpalus, by A. C. Harris. Alexandria, 1848. 4to. Pamphlet.—BY THE EDITOR.

The Calcutta Christian Observer for Nov. and Dec. 1848.—BY THE EDITORS.

The Oriental Christian Spectator, Vol. IX. Nos. 9-10.—BY THE EDITOR.

Geschiedenis en Beoordeeling van het Pantheïsme of Algodendom, door, S. A. Buddingh. 4to. Pamphlet.—BY THE AUTHOR.

Chun's Verzeichnitz nuier Bücher mit binschluss des Landkarten uud sonstiger im Buchhandel vorkommender Artikel, 4 vols. 12mo.—BY MR. H. B. KONIG of Bonn.

Die Sprachphilosophie der Alten, von Dr. L. Lersch. Parts I—III, 8vo. 2 copies.—BY THE SAME.

Zeitschrift Sur die Kunde des morganlandes. Im Viereine mit mehreren Gelehrten herausgegeben von C. Lassen. Siebenten Bandes erstes Heft, 2 copies.—BY THE SAME.

Kammavakya, Liber de officiis Sacerdotum Buddhicorum. Edidit Fredericus Spiegel, 8vo. 12 copies.—BY THE SAME.

Caroli Rieu de Abul Alae Poetae Arabici. Vita et Carminibus, secundum Codices Leidanos et Parisiensem commentatis. 8vo. 12 copies.—BY THE SAME.

Indische Alterthumskunde. von C. Lassen. Ersten bandes II. Hälfte. 7 copies.—BY THE SAME. (This work is dedicated to the Asiatic Society of Bengal).

De Accentu Compositorum Sanscriticorum ; Auctore S. T. Aufrecht. 8vo. 4 copies.—BY THE SAME.

Die Topographie Jarusalem's, von W. Krafft. Bonn, 1847, 8vo.—BY THE SAME.

Carmina Valerii Catonis cum Augusti Ferdinandi Naekii Annotationibus. Eura Ludovici Schopeni. Bonnae, 1847, 8vo. 3 copies.—BY THE SAME.

Geschichte der Klassischen Philologie im Alterthum, von Dr. A. Grafenhan. 3 vols. 8vo. 2 copies.—BY THE SAME.

Aristophanis Lysistratâ cum scholiis. Ex recensione Roberti Enger. Bonnae, 1844, 8vo. 2 copies.—BY THE SAME.

Aristophanis Thesmophoriazusae cum scholiis. Ex recensione Roberti Enger. Bonnae 1844, 8vo. 2 copies.—BY THE SAME.

Ueber die Keilinschriften der Ersten und Zweiten Gattung. Von C. Lassen und N. L. Westergaard. Bonn, 1845, 8vo. 2 copies.—BY THE SAME.

Bibliothecae Sanskritæ sive Recensus Librorum Sanskritorum Hucusque typis vel Lapide exscriptorum critici Specimen. Bonnae ad Rhenum, 1847, 8vo. 13 copies.—BY THE SAME.

Mric'chakatiká id est Curriculum Figlinum Sadrakæ Regis Fabula Sanscritæ, edidit Adolphus Fridericus Stenzler. Bonnae, 1847, 4to. 10 copies.—BY THE SAME.

Biblische Abhandlungen von Dr. J. G. Sommer. I. band.—BY THE SAME.

Rámáyana ; id est carmen epicum de Ramæ Rebus Gestis Poetæ Antiquissimi Valmícis opus. Adiecit, Aug. Guillemus a Schlegel. Vol. I. parts I. and II. and Vol. II. part I. 8vo.—BY THE SAME.

### *Exchanged.*

The Athenæum, Nos. 1087, 1090, 1091—1097 and 1099.

The Picnic Magazine, Nos. IX. X. and XI.

### *Purchased.*

Comptes Rendus, Tome XXVII. Nos. 5—11.

Journal des Savants for Aug. 1848.

The Annals and Magazine of Natural History, Nos. X.—XI.

The Edinburgh Review, No. 178.

Brija Kisora Ghosa's History of Puri.

Atlas to Allison's History of Europe, parts XVII. XVIII. and XIX.

Gould's Birds of Australia, parts 35 and 36.

Edmond's Distribution List of the Bengal Civil Service for Nov. 1848.

### *Museum of Antiquities.*

The donations received in this department since the last meeting, are as follow :—

1. From J. S. Campbell, Esq. A New Zealand water-proof cloak.
2. From—Fitzgerald, Esq. A stone arrow-head, from a mount near the summit of the Allighanies.
3. From the University of Christiana. A bronze medal and seven Norwegian silver coins. The medal bears, on the reverse, a bust of the king Charles John, and the inscription—*Carolo Johanni D. G. Regi Norv. Soec. Goth. Vand. Anno Imp. XXV. Urbs Nidarosiae Memor M.D.CCC.XLIH.* On the obverse, the king is seated on a throne in the centre of a gothic apartment, around which is inscribed—*Priscum Nidarosiae decus Restitutum. Die VII. Septembo M. D. CCC.XVIII.*

*Report of Curator, Zoological Department.*

My last published Report was that for the month of June, published in the No. of the Journal for that month; and I have now to record the donations received since that time.

July, 1848. M. Alfred Malherbe, of Metz. A large collection of mammalia and bird skins, and of land and fresh water shells, chiefly from Algiers, with others from different parts of Europe; together with sundry specimens of mammalia and birds packed with them by Mr. A. Bartlett, including many presented by H. E. Strickland, Esq.

The collection received from M. Malherbe is as follows: (1)

MAMMALIA.

*Genetta afra*,—Algiers.

\**Mustea erminea*, L. France.

*Lutra vulgaris*, var.? (N. S. apud Lesson.) Algiers.

*Sorex alpinus*,—Switzerland (St. Gothard.)

*S. araneus*, L. France.

*Dipus mauritanicus*,—Algiers (Oran).

†*Mus rattus*, L. Three specimens. France.

\**M. sylvaticus*, L. Switzerland.

*Arvicola nivalis*,—Switzerland (snowy summits.)

\**Lemmus norvegicus*,—Norway.

*Cephalophus natalensis*, A. Smith. Port Natal. S. Africa.

AVES.

\* †*Tinnunculus cenchris*, (L.): *Falco tinnunculoides*, Natterer. Female. Algiers.

†*Circus cinerascens*, (Mont.) Adult and young males. Algiers.

\* †*Accipiter nisus*, (L.) Male and Female. Algiers.

†*Gyps fulvus*, (L.) Adult. Algiers.

*Scops Aldrovandi*, Ray; *Strix scops*, L. Algiers. (Identical with the Indian species, of which the grey variety is *Sc. pennata*, Hodgson, and the chesnut variety—figured in Mr. Jerdon's 'Illustrations of Indian Ornithology,' pl. 41,—is *Sc. sunia*, H. (2)

(1) The species of which the museum had previously European specimens have an asterisk prefixed; and those of which it contained Indian examples are distinguished by a cross. Those of other regions previously in the museum are marked with a double cross.

(2) M. Malherbe remarks of this species, in his 'Catalogue Raisonné des Oiseaux de l'Algerie,'—"Paroit plus rare: forêts de la Calle. Le sujet que j'ai reçu est d'un roux vif rayé de noir et de cendré." That forwarded by him to the Society is grey with a rufescent tinge.



*Athene noctua*, (Retz : *Strix nudipes*, Lesson : *Str. passerina* apud Latham and Temminck ; *Athene bactrianus*, nobis, J. A. S. XVI, 776). Two specimens. Algiers.

\**Nyctale Tengmalmi*, (Gmelin). Sweden.

\**Syrnium aluco*, (L.) Algiers.

†*Upupa epops*, L. Female. Algiers.

\*†*Coracias garrula*, L. Algiers.

†*Ceryle rudis*, (L.) Greece. (Identical with *C. varia*, Strickland, of India.)

\**Alcido ispida*, L. Algiers.

\**Merops apiaster*, L. Morea.

*Picus medius*, L. Male and female. France.

*P. pubescens*, L. Male. N. America.

\**P. minor*, L. Male. France.

\**Picoides tridactylus*, (L.) Female. Switzerland.

*Celeus flavescens*, (Gm.). Male. Brazil.

*Dendrobates goërtan*, (Gm.) Male and female. Hab. Senegal.

*Colaptes cayannensis*, (Gm.) Male. Oronoco.

*Oxylophus glandarius*, (L.) Male and female. Algiers.

*Caprimulgus ruficollis*, Tem. Female. Algiers.

†*Cypselus melba*, (L.) Female. Switzerland.

†*Pyrrhocorax alpinus*, Vieillot. Male. Pyrenees.

\**Nucifraga caryocatactes*, (L.) Male. France.

†*Sturnus unicolor*, Marmora. Male and female. Sardinia. (These have scarcely a trace of the brilliant-coloured glosses of Capt. Hutton's Afghanistan specimens.)

*Passer salicaria*, ( ) ; *Fringilla hispaniolensis*, Tem. Male and female, Algiers. (Identical with the Afghanistan race.)

*Petronia stulta*, (Gm.) : *Fringilla petronia*, L. Male. Italy. (Do.)

\**Acanthis cannabina*, (L.) Male. Algiers.

\**Chrysomitris spinus*, (L.) Male. France.

*Centrophanes lapponicus*, (L.) Male and female. Finnmark.

\**Emberiza miliaria*, L. Two specimens. Algiers.

\**E. cirrus*, L. Male. Algiers.

*E. melanocephala*, Gm. Male. Dalmatia. (Differs from Mr. Jerdon's *E. melanocephala* of S. India in its much larger size ; having the wing 4 in., the tail 3 in. long, and the rest in proportion.)

*E. cæsia*, Cretschmar. Male. Lombardy.

\**E. hortulana*, L. Male. Italy.

*E. hyemalis*, (L.) Male. Siberia.

\**Melanocorypha calandra*, (L.) Two specimens, from Italy and Algiers.



*Galerida cristata*, (L.) Algiers. (Well distinguished from the species referred in the museum to *G. chendoola* and *G. Boysii* of India).

†*Calandrella brachydactyla*, (L.) Italy. (Identical with the so called 'Ortolan' of India, *Emberiza baghaira*, Franklin, v. *Alauda dukhunensis*, Sykes.)

*Accentor alpinus*, (Gm.) Male and female. Switzerland.

*Parus sibiricus*, Gm. Siberia.

*Lanius rufus*, L. Two males. Algiers.

*Pycnonotus obscurus*, (Gm.) Female. Algiers.

†*Petrocossyphus cyaneus*, (L.) Male and female. Italy and Algiers. (Identical with *P. longirostris*, nobis, *J. A. S. XIV*, 150; and barely, if at all, separable from *P. pandoo* (Sykes): but distinct from *P. affinis*, nobis, and *P. manillensis*, (Gm.).

*Saxicola leucura*, (Gm.) Female. Algiers. (Distinct from *S. leucura* apud nos, *J. A. S. XIV*, 131; now *S. opistholeuca*, Strickland.)

*S. stapazina*, (Gm.) Male. Algiers. (Well distinguished from *S. atrogularis*, nobis, *J. A. S. XVI*, 131.)

*S. aurita*, Tem. Male. Algiers.

\**Pratincola rubicola*, (L.) Three specimens. Algiers.

\**Pr. rubetra*, (L.) Female. Algiers.

*Ruticilla tithys*, (L.) Female. France.

*Muscicapa atricapilla*, Gm.: *M. luctuosa*, Tem. Algiers.

\* †*Hirundo rustica*, L. Algiers.

†*H. rupestris*, Gm. Algiers.

†*Budytes melanocephala*, (Savi). Male. Algiers. This appears to be perfectly identical with the common Indian and Malayan species, the adult males of which (towards the breeding season) have the head and ear-coverts dark fuscous-slaty, contrasting with a white chin and line bordering the throat, and a bright yellow throat and under-parts. Whether during the height of the breeding season the head becomes pure black, we are unaware; but suspect not, though we have seen black-headed specimens in European museums. Burnes figures one from Kabul, and Mr. Jerdon refers to such in the Madras Journal, XI, 19, citing them under the name *B. melanocephala*.) (1)

*B. cinereocapilla*, Bonap. Male. Algiers. (Resembles the last, except that the whole throat, as well as chin, is pure white.)

\**B. flava*, (L.): *B. neglecta*, Gould. Male. Algiers. (Identical with speci-

(1) Capt. T. Hutton has subsequently presented the museum with a pair from Kandahar, the male of which has the head, nape, and ear-coverts quite black. His Deyra Doon species appears to be the same as the Bengal one; but his Pied Wagtail of the Doon is well distinguished alike from *Motacilla luzoniensis*, *alba*, and *Yarrellii*.

mens from Norway ; and scarcely, if at all, distinguishable from some young specimens of the common Bengal species, which have the white supercilium more or less developed.)

\**B. flaveola*, (Tem.): *B. flava* of British authors, *passim*: *B. Raii*, Bonap. Male. Algiers. (The crown much darker than in British specimens, and the yellow supercilium, consequently, more strongly contrasting.)

†*Anthus trivialis*, (L.) Algiers.

†*A. Richardi*, Vieillot. Young female. Sicily.

†*A. aquaticus*, Bechstein. Two specimens: in summer plumage; Switzerland: winter dress; Algiers.

†*A. campestris*, Vieillot: *A. rufescens*, Tem. Algiers. (Identical with *A. rufulus* apud Jerdon et nos; and the true *A. rufulus* is decidedly the common *A. malayensis*, Eyton.)

*Aëdon galactotes*, (Tem.) Two specimens. Algiers.

†*Cisticola cursitans*, (Franklin): *C. schænicola*, Bonap. Algiers. (Undistinguishable from Indian specimens, unless it be that the average size is rather larger, and the black predominates more upon the crown. If procured in India, this Algerian specimen would scarcely be remarked even as a slight variety.)

*Calamodyta aquatica*, (Gm.) Two specimens. Sardinia.

*Curruca orphea*, (Tem.) Female. Algiers. Distinct from *C. Jerdoni*, nobis, v. *C. orphea* apud Jerdon, *Catal.*)

*C. melanocephala*, (Lath.) Male and female. Algiers.

*C. provincialis*, (Gm.) Male and female. Sardinia and Algiers.

\**Phylloscopus sibilatrix*, (L.) Italy.

\**Ph. trochilus* (L.) Algiers.

\**Ph. rufus*, (Bechst.) Two specimens. Algiers.

*Ph. Nattereri*, (Tem.) Two specimens. Italy.

*Regulus ignicapillus*, Leach. Two males and female. Sardinia.

\**Troglodytes europæus*, (L.) France.

†*Tichodroma muraria*, (L.) Male and female. Sardinia.

*Columba livia*, L. Four domestic varieties.

*Pterocles alchata*, (L.): *Pt. setarius*, Tem. Male. Spain.

\**Lagopus mutus*, Leach: *L. alpinus*, Nilsson. Male, winter; female, autumn. Switzerland.

*L. islandorum*, Faber: *Tetrao hyperboreus*, Tem. Male and female. Iceland.

*Caccabis græca*, (Ray): *Perdix saxatilis*, Tem. Male and female, Italy. (Only differs from *C. chukar* of the Himalaya, Afghanistan, &c., in having a purely white throat, and in the ferruginous of the ear-coverts being less marked.)

*Turnix andalusica*, (Gm.): *Hemipodius tachydromus*, Tem. Specimen from Algiers (Oran).

†*Sypheotides afra*, (Gm.) Male. S. Africa.

†*Squatarola helvetica*, (L.) Two specimens. Algiers.

†*Hiaticula cantiana*, (Lath.) Two specimens. Algiers.

\**H. annulata*, G. R. Gray: *Charadrius hiaticula*, L. Algiers.

†*Himantopus candidus*, Brisson: *H. melanopterus*, Ray. Female. Algiers.

\*†*Hæmatopus ostralegus*, L. Algiers.

†*Totanus ochropus*, (L.) Algiers.

†*T. hypoleucos*, (L.) Algiers.

\*†*Tringa minuta*, (L.) Algiers.

†*Falcinellus igneus*, (L.) Female. Sicily.

†*Herodias bubulcus*, (Sav.): *Ardea russata*, Tem. Young. Sicily.

†*Botaurus stellaris*, (L.) France.

\**Ardetta minuta*, (L.) Sicily.

\**Sterna paradisea*, Brunnich. Adult and young. Algiers and Sicily.

\*†*St. hirundo*, L. Male. Algiers.

\**Hydrochelidon nigra*, (L). Summer and winter dress. Algiers.

*H. leucoptera*, (Tem.) Summer dress. Algiers.

†*Xema ridibundus*, (L). Algiers.

\**Catarracta pomarina*, (Tem). Newfoundland.

†*Phaenicopterus roseus*, Pallas: *Ph. antiquorum*, Tem. Old male. Algiers.

†*Fuligula nyroca*, (L.) Female. Algiers.

†*F. cristata*, (L). Male. England.

*Erismatura mersa*, (Pallas): *Anas leucocephala*, Female. Algiers.

\*†*Mergus merganser*, L. Male. Algiers.

\**M. serrator*, L. Female. Algiers.

*Podiceps auritus*, L. Male; breeding dress. Algiers.

\*†*P. philippensis*, Gm.: *Colymbus minor*, ibid. Two. Algiers.

#### TESTACEA.

*Helix maritima*,

2. Oran.

*H. lactea*,

1. France (Perpignan). 1. Africa (rare).

*H. albella*,

2. Algiers.

*H. hieroglyphica*,

2. Oran.

*H. Jannotiana*,

1. Oran.

*H. candidissima*,

2. France. 1. Oran.

*H. pisana*, Muller.

3. France. 1. Algiers.

*H. variabilis*,

3. France.

*H. niciensis*,

2. France. 1. do. var. (very rare),

<i>H. pyrenaica</i> ,	2. France.
<i>H. cariosa</i> ,	2. Oran.
<i>H. alabastitis</i> ,	1. Africa.
<i>H. hispanica</i> , L.	1. Oran.
<i>H. Dupotetiana</i> ,	1. Oran.
<i>H. terrestris</i> , Pennant ( <i>H. elegans</i> , Drap., nec Brown).	3. France.
<i>H. cespitum</i> ,	2. France.
<i>H. olivetorum</i> ,	2. France.
<i>H. splendida</i> ,	2. Constance(?)
<i>H. obvoluta</i> , Gualtieri.	2. France.
<i>H. sylvatica</i> , (Drap. pl. VII, f. 27-29).	2. France.
<i>H. lapicida</i> , L. (Drap. VII, f. 35-37).	3. France.
<i>H. carthusianella</i> , (Drap. VI, f. 31, 32).	3. France.
<i>H. cornea</i> ,	2. France.
<i>H. fruticum</i> , Chemnitz (Drap. pl. V, f. 16-17).	3. France.
<i>H. naticoides</i> ,	1. Africa.
<i>H. altenana</i> ,	2. France.
<i>H. hortensis</i> , Muller (Drap. pl. VI, f. 6).	4. France.
<i>H. nemoralis</i> , Muller (Drap. pl. VI, 3-5).	11. France.
<i>H. melanostoma</i> ,	1. France.
<i>H. arbustorum</i> , Muller (Drap. pl. V, f. 18).	4. France.
<i>H. pyramidata</i> ,	4. France.
<i>H. lenticula</i> ,	2. France.
<i>H. Cervieri</i> ,	1. France.
<i>H. strigella</i> ,	2. France.
<i>H. vermiculata</i> ,	1. France.
<i>H. algira</i> , Lister.	1. France.
<i>Bulimus acutus</i> , Lister.	12. Oran.
* <i>B. radiatus</i> ,	3. France.
* <i>B. decollatus</i> , Drapernaud.	2. France.
<i>Pupa tridens</i> , Drapernaud (pl. III, 57).	7. France.
<i>P. quadridens</i> ,	5. France.
<i>P. Goodallii</i> , (Mich. pl. XV, f. 39, 40).	5. France.
<i>P. pyrenaica</i> ,	2. France.
<i>P. avena</i> , (Drap. pl. III, f. 47, 48).	13. France.
<i>P. secale</i> , (Drap. pl. III, f. 49, 50).	18. France.
<i>P. cylindrica</i> ,	2. France.
<i>P. variabilis</i> ,	5. France.
<i>P. cinerea</i> ,	9. France.
<i>P. farensi</i> ,	5. France.



* <i>Clausilia parvula</i> , (Mich. pl. XV, f. 21, 22).	15. France.
<i>Cl. bidens</i> , (Muller, Drap. pl. IV, f. 5-7).	6. France.
<i>Cl. ventricosa</i> , (Drap. pl. IV, f. 14).	11. France.
<i>Achatina folliculus</i> ,	2. Oran.
<i>Lymnea stagnalis</i> , (Muller).	2. France.
<i>L. auricularis</i> ,	4. France.
* <i>Physa hypnorum</i> ,	8. France.
<i>Cyclostoma mammillare</i> , Lam. ( <i>C. Voltzianum</i> , Michard).	4. Oran.
<i>C. maculatum</i> , Draparnaud (pl. I, f. 12).	6. France.
<i>C. sulcatum</i> ,	2. France.
<i>Paludina viridis</i> , (Drap. pl. I. f. 26, 27).	17. France.
* <i>Dreissina polymorpha</i> , (Gm.)	2. France.
* <i>Anadonta anatina</i> , (L. Drap. pl. XII, f. 2).	1. France.
<i>A. minima</i> , Millet (Mem. de la Soc. d'Hist. Nat. du Dept. de la Moselle, 1843, 2d Cahier, p. 44).	2. France.
<i>Unio rostrata</i> , (Mich., pl. XVI, f. 25).	2. France.
* <i>U. batava</i> , (Turton).	2. France.
* <i>U. pictorum</i> , (L.; Drap. pl. XI, f. 1, 2, 4).	2. France.
<i>U. Requienei</i> ,	1. France.

With the above collection were also received the following :

From H. E. Strickland, Esq.

*Plecotus auritus*, Geoffroy.

\**Melanocorypha calandra*, (L.). Europe.

\**Fringilla montifringilla*, L. M. and F.

*Emberiza aureola*, Pallas. Siberia. (*N. B.* Distinct from the Indian species hitherto so termed,—*E. flavogularis*, nobis,—by having the lores, supercilia, ear-coverts and throat, black, &c.)

From Mr. A. Bartlett (for sale, or to receive the value in Indian specimens,)—

Of MAMMALIA—

*Felis leo*, L. Skeleton.

*Cercoleptes caudivolvulus*, (Pallas). Do.

*Procyon lotor*, (L.), and

*Nasua fusca*, Desm. Skulls.

Also skins (without bones) of

*Cercopithecus sabæus*, (L.) 2, and of

*C. ruber*, (Gm.) 2. In bad order.

*Felis leo* (*N. Africa*, very fine, and since mounted in the museum), taken from the individual of which the skeleton is also sent.

*Procyon lotor*, L.

*Nasua fusca*, Desm. Tail imperfect.

*Cercoleptes candivolvulus*, (Pallas). Imperfect.

*Cælogenys paca*, (L.)

*Cervus virginianus*, L. Young male (not good).

*C. tarandus*, L. Juv. (forwarded on account of the Zoological Society).

*Myrmecophaga jubata*, L.

*Dasypus sex-cinctus*, L. (epidermis wanting to bony dermal plates).

*Dasyurus viverrinus*, (Shaw). brown variety.

*Phalangista vulpina*, (Meyer).

#### AVES.

\**Macrocerus macao*, (L.)

*M. ararauna*, (L.)

\**Chrysotis amazonicus*, (Gmelin.)

*Chr. leucocephalus*, (L.)

*Calurus resplendens*, Gould.

*Rupicola aurantia*, Vieillot, 2 males.

*Paroaria dominicana*, (Gm.)

*Psophodes crepitans*, (L.) (Bad.)

*Penelope jacucacu*, Spix.

*Tetrao cupido*, L. Fœm.

*Houbara undulata*, Jacq. Male.

\**Cygnus atratus*, Latham.

*Dendrocygna viduata*, (L.)

\**Anas sponsa*, L. Male, non-breeding plumage.

Also a collection of glass eyes for stuffed animals.

2. The late G. T. Lushington, Esq. C. S., of Almorah. A skin of *Ovis ammon*, Pallas.

3. Mr. Birch, of the Pilot Service. A small living Crocodile.

4. Mr. P. Homfrey. A dead Squirrel (*Sciurus purpureus*), since prepared as a skeleton.

5. Babu Rajendra Mallika. Two dead specimens of *Satyra cornuta*.

#### AUGUST.

6. Babu Harri Chanda Ghose (Principal Sadir Amin of the 24 Pergunnas). A living *Felis viverrina*, since mounted in the museum.

7. W. C. Thorburn, Esq., now of Sandoway, Arracan. A few mammalia and bird-skins, from Chittagong.

## SEPTEMBER.

8. Capt. Lewis. A young Kangaroo in spirit.
9. Babu Rajendra Mallika. A dead male of *Gazella cora*.
10. C. Huffleagle, Esq. A dead specimen of *Arctonyx collaris*, and one of *Buceros pusaran*.
11. R. W. G. Frith, Esq. A semi-albino Snake, of the species *Tropidonotus umbratus*, (Daud.)
12. Babu Rajendra Mallika. Eight species of stuffed Parrots, of which four are new to the Society's collection, viz. *Coracopsis nigra*, (L.), *Aprosmictus erythropterus*, (Gmelin), *Platycercus semitorquatus*, Quoy and Gaymard, and *Eos Novæ Guineæ*, (Latham).

## OCTOBER.

13. Mr. Cleghorn, of the Pilot Service. A specimen, just dead, of the *Anous stolidus*, (L.), procured at the Sandheads during the violent storm of that month.
14. Col. Low, Penang. Specimens of an unnamed Swift, and of its nest.
15. Babu Rajendra Mallika. A stuffed female Silver Pheasant (*Gallus nycthemerus*).

## NOVEMBER.

16. Capt. S. R. Tickell. A few bird-skins from Darjiling, comprising a new species and genus of Shrike, for which Capt. Tickell proposes the name *Thamnocataphus picatus*.
17. E. L. Layard, Esq., and R. Brodie, Esq., Ceylon. A collection of mammalia and bird-skins from that island, comprising several new species, of which I am requested to draw up descriptions for the Society's Journal.
18. T. Hart, Esq., H. M. Steamer 'Inflexible.' A collection of shells from New Zealand; also a Pilot fish, *Naucratus ductor*, (L.); and an *Echeneis*, taken in the Indian Ocean: 3 specimens of an apparently undescribed Scincoid Lizard from the new settlement of New Edinbro', New Zealand; and a few Crabs and other *Crustacea* taken off the shores of that country.
19. Mr. J. Prosser. Some specimens of Swifts, in spirit, from Penang, comprising an undescribed species of *Acanthylis*.
20. R. Fitzgerald, Esq., of N. Carolina. The rattle of a Rattle-snake (*Crotalus*).

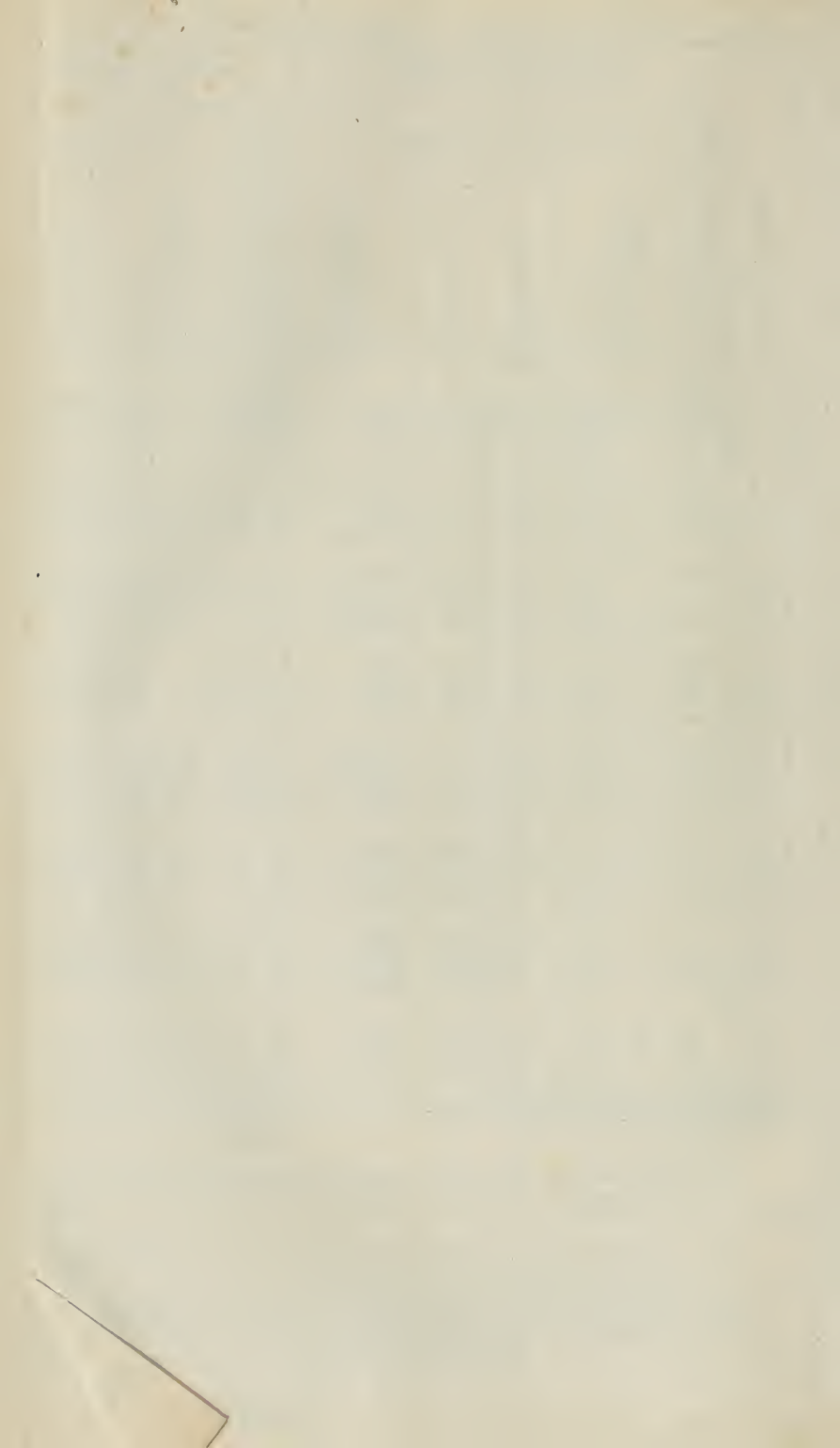


# Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of Jan., 1849.

Lat. 22° 33' 28". 33 N. Long. 88° 23' 42". 84 East. Mag. Variation 2° 28' 36" East. Mag. Dip. 27° 45'.

Days of the Month.	Observations made at sunrise.					Maximum Pressure observed at 9h. 50m.					Observations made at apparent noon.					Observations made at 2h. 40m. p. m.					Minimum Pressure observed at 4 p. m.					Observations made at sunset.					Maximum and Minimum Thermometer.			Rain Gauges.		Days of the month.							
	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Maximum.	Mean.	Minimum.	Maximum.	Elevations.													
		Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.								Of the Mercury.	Of the Air.	Of Wet Bulb.	Of the Mercury.	Of the Air.	Of Wet Bulb.		Of the Mercury.	Of the Air.	Of Wet Bulb.	Direction at sunset.	Direction at sunset.	Upper.	Lower.
Inches	°	°	°		Inches	°	°	°		Inches	°	°	°		Inches	°	°	°		Inches	°	°	°		°	°	°	°	Inch.	Inch.													
1	30.190	57.2	57.4	54.7	Calm.	Clear.	30.182	66.4	67.8	61.4	N.N.W.	Clear.	30.127	76.0	75.0	63.9	N.	Clear.	30.012	78.2	76.3	62.2	N.N.W.	Clear.	30.052	77.9	75.7	61.9	N.N.W.	Clear.	30.065	74.5	72.3	61.9	Calm.	Clear.	79.6	71.2	62.8	100.2	100.2	1	
2	127	55.7	56.0	55.0	Ditto	Ditto	181	67.0	68.7	61.2	N.	Ditto	137	76.2	75.2	62.9	N.N.W.	Ditto	072	78.2	77.0	63.6	N.W.	Ditto	062	77.9	76.2	63.2	N.	Ditto	079	74.6	72.4	62.8	Ditto	Ditto	79.2	68.5	57.7	99.0	99.0	2	
3	125	56.0	56.5	55.7	Ditto	Ditto	176	67.4	68.2	60.6	N.	Ditto	122	75.8	74.6	64.0	N.W.	Ditto	050	79.0	77.9	64.2	N.N.E.	Ditto	036	79.3	77.0	63.6	N.W.	Ditto	042	74.9	72.9	64.2	Ditto	Ditto	80.0	68.2	56.4	102.3	102.3	3	
4	089	58.2	58.8	56.7	Ditto	Cirro cumuli.	153	69.7	70.9	63.2	N.E.	Ditto	100	76.8	75.8	64.4	N.W.	Ditto	031	79.7	79.2	66.4	N.	Ditto	020	80.0	78.2	65.3	N.N.W.	Cirro cumuli.	028	76.8	75.2	64.8	N.N.E.	Cirro cumuli.	80.8	69.8	58.8	99.7	99.7	4	
5	070	58.7	59.8	58.0	Ditto	Clear.	121	68.9	69.5	63.4	N.N.W.	Ditto	074	76.2	75.1	66.9	N.N.W.	Ditto	008	80.0	79.7	67.4	N.	Ditto	29.997	80.3	78.0	65.2	N.N.W.	Clear.	002	76.8	75.0	64.9	N.	Clear.	81.0	70.5	60.0	101.0	101.0	5	
6	090	60.0	60.4	55.0	N.	Ditto	152	70.2	70.0	60.2	N.	Ditto	109	75.4	74.3	61.9	N.	Ditto	042	78.0	77.0	63.0	N.N.W.	Ditto	30.034	77.7	75.4	61.8	N.N.W.	Ditto	042	74.0	72.5	60.7	N.N.W.	Ditto	79.0	69.5	60.0	97.0	97.0	6	
7	105	57.2	57.5	53.8	N.N.W.	Cirro strati.	163	66.2	66.7	59.4	N.N.W.	Cirro strati.	098	73.3	71.9	60.3	N.N.W.	Cirro strati.	022	76.0	74.4	60.1	N.	Cirro strati.	008	75.0	73.9	59.8	N.N.W.	Cirro strati.	006	72.3	70.8	58.7	N.N.W.	Cirro strati.	76.9	67.1	57.3	95.0	95.0	7	
8	097	57.4	57.5	53.8	N.N.W.	Clear.	162	67.6	68.3	59.5	N.	Clear.	097	75.2	74.6	61.8	N.N.W.	Clear.	026	78.0	77.2	63.0	N.	Clear.	020	77.0	75.3	61.5	N.N.W.	Clear.	022	74.9	72.0	61.2	N.	Clear.	79.0	68.3	57.5	100.0	100.0	8	
9	123	55.7	55.5	53.2	Calm.	Clear.	128	66.3	67.8	60.3	N.	Cirro cumuli.	084	74.2	72.0	61.2	N.W.	Cloudy.	025	79.5	78.9	61.8	N.	Cloudy.	025	71.5	70.9	61.7	N.W.	Cloudy.	022	70.2	69.0	62.6	Calm.	Cloudy.	75.0	65.7	56.3	89.2	89.2	9	
10	123	55.7	55.5	53.2	Calm.	Clear.	178	66.4	68.5	58.9	N.N.W.	Clear.	123	76.0	75.2	61.4	N.W.	Clear.	059	79.5	78.9	61.8	N.	Clear.	051	79.5	77.8	60.8	N.	Clear.	066	75.0	73.0	60.0	N.N.W.	Clear.	80.6	68.2	55.7	100.0	100.0	10	
11	104	54.8	55.0	53.0	Ditto	Cirro strati.	135	66.9	67.6	59.2	N.	Cirro strati.	094	73.4	71.8	58.7	N.N.W.	Scattered clds.	024	73.5	72.8	59.3	N.W.	Cloudy.	024	73.5	72.8	59.3	N.N.W.	Cloudy.	036	71.2	70.5	60.0	N.N.W.	Cloudy.	76.4	65.8	55.2	92.4	92.4	11	
12	073	56.0	56.1	53.7	Ditto	Clear.	101	66.0	66.7	59.4	N.N.W.	Clear.	038	73.7	73.0	61.3	N.W.	Clear.	29.956	76.5	75.3	61.0	N.	Clear.	29.951	76.7	75.0	59.9	N.W.	Clear.	29.965	73.2	71.0	60.0	Calm.	Clear.	77.9	67.1	56.2	100.2	100.2	12	
13	040	54.0	54.3	52.2	Ditto	Ditto	096	69.4	69.9	60.0	N.	Ditto	036	76.6	75.8	62.4	N.W.	Ditto	976	78.3	77.0	61.6	N.N.W.	Ditto	968	78.0	76.4	62.0	N.	Ditto	982	75.0	72.2	61.2	Ditto	Ditto	79.7	67.1	54.5	101.5	101.5	13	
14	060	55.0	55.2	53.8	Ditto	Ditto	140	67.8	68.8	61.0	N.W.	Ditto	078	76.2	74.4	62.8	N.E.	Ditto	30.016	78.8	78.2	63.7	N.	Ditto	30.004	79.0	76.9	62.7	N.	Ditto	30.010	75.2	73.5	61.5	N.	Ditto	80.0	67.9	55.7	98.3	98.3	14	
15	046	55.0	56.2	55.0	Ditto	Ditto	104	67.4	69.0	60.0	E.	Ditto	058	76.7	76.0	64.0	N.E.	Cirro cumuli.	009	79.4	77.8	63.1	N.	Cirro cumuli.	29.998	79.0	77.4	63.9	N.S.W.	Cirro cumuli.	29.997	75.4	72.6	61.2	S.W.	Cirro cumuli.	80.5	68.0	55.4	103.0	103.0	15	
16	29.948	56.8	57.5	56.8	Ditto	Cirro strati.	29.987	67.0	67.2	61.0	N.E.	Cloudy.	29.936	74.2	72.5	63.2	S.E.	Cloudy.	29.880	74.2	72.8	63.0	E.S.E.	Cloudy.	861	72.8	72.1	62.7	N.E.	Cloudy.	889	71.8	71.2	63.0	N.	Cloudy.	75.2	66.1	57.0	92.4	92.4	16	
17	280	58.4	58.5	58.0	S.W.	Drizzly.	954	62.3	62.3	60.2	S.S.W.	Drizzly.	919	67.0	65.5	61.8	S.S.W.	Cumulo strati.	873	71.5	70.2	63.3	S.S.W.	Cumulo strati.	871	72.2	69.8	62.8	S.	Cumulo strati.	910	70.0	67.4	61.8	E.	Clear.	72.7	65.4	58.0	95.7	95.7	17	
18	30.028	57.0	57.0	57.0	N.E.	Foggy.	30.096	60.0	60.0	59.4	N.E.	Ditto	30.061	64.6	63.2	61.6	N.	Cloudy.	30.002	70.3	69.0	63.7	N.	Ditto	988	71.2	69.0	62.5	N.	Ditto	992	67.8	66.0	61.8	N.E.	Cirro cumuli.	71.2	64.1	56.9	91.9	91.9	18	
19	037	55.8	55.8	55.8	Calm.	Ditto	088	65.4	65.2	62.0	N.N.W.	Cumuli.	047	71.5	70.6	64.2	N.N.W.	Cumulo strati.	29.988	72.3	70.9	62.8	N.N.W.	Ditto	985	72.9	71.3	62.8	N.W.	Ditto	990	70.2	68.5	61.8	N.W.	Clear.	74.2	65.0	55.8	96.0	96.0	19	
20	080	56.4	56.2	56.0	Ditto	Clear.	138	68.0	68.0	64.0	N.N.W.	Ditto	092	74.0	72.6	63.8	N.N.W.	Cumuli.	30.015	75.8	73.7	63.7	N.N.W.	Cumulo strati.	30.009	72.9	71.9	62.4	N.N.W.	Ditto	30.004	71.3	70.0	62.0	N.	Cumuli.	76.9	66.8	56.7	101.2	101.2	20	
21	064	56.8	57.5	57.0	Ditto	Clear.	126	68.0	67.8	63.2	N.	Clear.	074	74.2	73.4	64.2	N.S.W.	Cumulo strati.	010	75.0	73.3	63.5	N.N.W.	Ditto	008	76.5	75.0	64.6	N.N.W.	Ditto	010	72.6	71.0	61.2	N.W.	Clear.	77.5	67.4	57.2	100.3	100.3	21	
22	083	57.8	57.8	57.5	Calm.	Clear.	104	70.8	70.7	61.9	N.E.	Ditto	060	74.8	73.9	61.4	N.	Clear.	29.986	76.5	75.7	62.5	N.W.	Clear.	29.971	76.2	74.8	61.5	N.N.W.	Clear.	29.971	76.2	74.8	61.5	N.N.W.	Clear.	77.5	66.3	55.0	94.0	94.0	22	
23	29.983	57.8	57.8	57.5	Calm.	Clear.	017	70.0	70.9	62.5	S.	Ditto	29.973	77.6	77.2	67.4	S.W.	Ditto	904	80.0	79.4	67.7	N.W.	Ditto	897	80.8	79.0	66.3	N.N.W.	Ditto	29.904	77.0	74.8	66.2	N.	Cumuli.	81.8	69.9	58.0	103.0	103.0	23	
24	070	59.7	60.2	59.3	Ditto	Ditto	064	71.7	72.3	61.2	N.	Ditto	30.032	76.8																													





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*General Observations on the contending claims to antiquity of  
Brahmans and Buddhists, by Lieut.-Col. Low.*

It is only very lately that I had an opportunity of seeing the CLXVII. No of the Journal of the Asiatic Society of Calcutta of 1845 ; and of perusing the luminous and able critique it contains of M. Burnouf's work on Buddhism, by Dr. E. Roer.

But although the writer, seems to have convinced himself that the question respecting the disputed antiquity of the Brahmanic and Buddhist systems of religion, has been fairly set at rest, he can scarcely hope that every body will be quite prepared to follow his example. I will confess that some of the arguments adduced were to a certain extent in accordance with my own views, while others claimed the reader's close and unbiased attention, yet it appeared, and does still appear to me, that many preliminary conditions require to be fulfilled, and many points, however plausible, to be established by solid proof, before we can be called upon to give our final assent to the conclusions he has arrived at.

If I might be allowed to propose a theory which should serve to cool down the fervor of dialectics, and give time for a patient and scrupulous search after such facts as can at this day be only obtained from ancient Indian MSS. and from architectural remains, and their accompanying numismatic, religious and civil, records and inscriptions, it would be in some such terms as these :—

The brahmans are confessedly a foreign tribe in India, who were located at first in or about the Punjab.

They must, when they arrived, have been a small body—for they did not spread as a people beyond their original locality until centuries had elapsed.\*

From internal evidence they must have brought along with them (from Persia or the N. W. perhaps) a well defined system of social polity, and we must suppose a religion.†

If they had a religion, and had reached a clear stage of moral civilization, they must have had a written language: but it is not under this supposition easy to account for their not having preserved any satisfactory written account of themselves, either as an offset from their parent stock—or as a colony in a foreign land.

That the want of such records, and of dates, would, under the same supposition, lead to the inference that these brahmans wished to conceal their origin, and to thus give them an opportunity of throwing it back into the impenetrable darkness of the past. Thus for instance, although while first peopling or living in the Punjab, they must have been in constant contact with the Asiatic Greek kingdom, yet they have not preserved any thing I believe regarding them worthy of much notice, unless accidentally.

They appear also not to have left, in their original seat in the Punjab, any marks, architectural or otherwise, by which their residence there could or can be traced, unless there were, even then amongst them, schismatics, professing Hero worship, or that of Buddha, who might have co-operated in the building of the Chaityas there, all of which lead

\* As. Res. Vol. X. p. 32. The Peish-cára brahmans were Christians and first arrived in Ceylon (from Persia in A. D. 77.) There were Peish-cára kings in Indian, called the dynasties of Arygo, Saca and Salava, and there were 25 kings of the Sacas.

† Wilford says, that Brahma's heaven lies towards Tartary, and that the *Levites* were brahmans.<sup>1</sup> Faber considers that Brahma was the Bromius of the Greeks, the Broum of the old Irish—and when the brahmans desired to represent him in conjunction with his three sons Brahma, Vishnu and Siva they depicted him with four heads, but when the triple offspring of the patriarch (Noah) had to be figured, he had three heads only. These were Jupiter, Neptune and Pluto,—or the Phœnician Cromus the younger, Jupiter, Belus and Apollo—or Shem, Ham and Japhet.<sup>2</sup>

1 J. A. S. B. Vol. VIII. p. 359, 360. 2 Faber's Cabiri, Vol. II. p. 381.

to the inference that while in that locality their religion was that of the Vedas, solar and theistical, *or agni-istic*.

At the time of Alexander's invasion, brahmans, according to our acceptance of the term, do not appear on the stage—at least not as religionists—so that it is to be concluded that if they had a well defined religion, it was not an obtrusive one—while it seems to be yet doubtful if brahman was not a name subsequently given to the whole tribe, from the title of Brahmana, or pure, having been applied to the ascetics, whose haunts they perhaps chiefly contributed to fill.

The brahmans first start into public notice as intelligent, if not scientific and ambitious laymen, making themselves necessary to kings, and finally imposing on them their spiritual yoke. They had already begun to penetrate beyond their original and circumscribed bounds, when Buddha appeared, but all of India, which was in their front and flanks, must then have been unbrahmanized, and they had not reached Bengal until about B. C. 300—for Mr. Colebrooke informs us that the brahmans of Bengal are descended from *five* priests (only) who were invited (as astrologers perhaps,) from Canyacubja, by Adisura, king of Gaura. There were then too some Sareswatta brahmans and a few Vaidicas in Bengal.\*

There is, I apprehend, no proof that the brahmans had temples in India previous to the building of Buddhist Chaityas, and Viharos, or until Buddhism was on the decline.

There is no proof I believe that any brahmanical epigraphic or other inscriptions exist of a date prior to the earliest Buddhist ones of a similar description.

The sudden appearance of some of the earlier gods of the brahmans, when the latter began to see in the near vista a golden ladder reaching to the throne, shews that these gods had probably held a place in their creed for a long while before, if we are not to impute the monstrous birth to an impure, but a ready, fertile, and vivid imagination acting in concert with, and impelled by the new circumstances of their position.

There is no proof what the actual written character and language of the brahmans was at the period of *their arrival* in India. If these were Sanscrit we should be able to trace them to some more occidental region.

If both, which is probable, were rude and unpolished, it would be

\* As. Res. Vol. V. p. 66.



equally, if not more, reasonable, to assign to the cognate languages the Pali and Prakrit, a distinct origin, from however a cognate source, provided the direct derivation of these last from the Sanscrit cannot be proved. The Slavonic, the Latin, the Celtic—Thracian, German and Medo-Persian are all more or less allied to Sanscrit.\* Jaubilius declares that the language used in the Mysteries was not that of Greece, but of Egypt and Assyria, and Homer's dialect of the Gods, or the Arkite Ogdoad, was Chaldee or Hebrew. The tongues too of Chaldea, Syria, Palestine, Phenecia and Arabia, are kindred, and the radical language was widely diffused to *the north and east*.†

During this process of diffusion we may readily believe that it underwent some modifications, especially before ; and perhaps by different lines, it reached India.

Lieut.-Col. Sykes goes so far as to say that proof is wanting to shew that the Sanscrit, in its present form, existed until six or seven centuries after the Pali.

The brahmans, or those amongst them who were religiously inclined, finding perhaps on their reaching India, and for centuries afterwards, a race of settlers who were descendants of emigrants from the same western regions as themselves, and thus allied to them in a great degree in habits and feelings, readily coalesced with them ; and formed the Brahmana or Ascetic school of holy men, each acting for himself, yet associating to a certain extent in selected places, leaving the gods, which then may have been recognized, to be venerated or worshipped by the multitude ; until the latter, running into the first extravagances of polytheism, called for regenerators and reformers, beginning with the first Buddha, unless the process had begun before the ascetic amalgamation had taken place, and could then be reduced to a reasonable period.‡

\* M. Suffarik. Foreign Quarterly Review, Oct. 1840.

† Faber quoting Diodorus, Vol. I.

‡ Wilford observes, " that long before Christ, a renovation of the universe was expected all over the world with a Saviour, a King of peace and justice,<sup>1</sup> and the Magi of Scripture carried this idea with them from the East.

" The new Asæ or Godlike men from the east, took to themselves the names of the *ancient ones* and gave themselves to be the real Asæ or Gods."<sup>2</sup> Odin was one of these. The Emperor Augustus was consecrated a God after his death, and both before and after it temples were erected in his honor and sacrifices offered to him.

1 As. Res. Vol. X. p. 27.

2 Ditto quoting Gylfe.

The Sannyasis of India at this day, have eighteen modes of devotional discipline.\*

The author of the version of the *Milinda Raja* informs us in that work that he has only given an abstract account of the austerities and observances of the secluded devotees, who aspire to supreme felicity, in the wild recesses of hills and forests, away from all intercourse with their species, and that the work itself is merely a compendium.

The 28 rules and observances, &c. &c.

- 1 Attanang rakk'hati.
- 2 Ayungwadhati.
- 3 Phalang théti.
- 4 Wachang hitha hati.
- 5 Ayasang winó theti.
- 6 Yasamu panítí.
- 7 Arátíng nasa yati.
- 8 Rátíng uppa theti.
- 9 Waya apaneti.
- 10 Wesa rachang kasutí.
- 11 Kosachha mupanétí.
- 12 Weripang Chauctí.
- 13 Watu panetí.
- 14 Dosu panetí.
- 15 Mohang.
- 16 Manang hanetí.
- 17 Suwitakang b'hachétí.
- 18 Chité Kakkhalang karoti.
- 19 Chittang Sanné hayati.
- 20 Hasang jhana yati.
- 21 Pítíng upphaj hetí.
- 22 Gharukang karoti.
- 23 Labhang napphattayati.
- 24 Mana piyang karotí.

One of these Temples was near Bombay. We find in the late Mr. Turnour's translation of the *Mahawanso* the counterpart of Virgil's and other antient writers' accounts of the anticipated renovation of the world where the golden age was to recommence then the Argonauts were to appear followed by the *Argo* and so on.

\* As. Res. B. Vol. V. p. 38.

25 K'hanting palíti.

26 Sangh-karanan sab'hawang angséti.

27 B'hawa patí sant'hang ukghatéti.

28 Sapp'hang samanyang theti.

In the Ratana Kalapa I find that under the head *Kasina*, these or similar recluses must sit before a small circle of earth until a new revelation of the universe bursts upon them. They must contemplate water, and fire, and air ;—also the colours, blue, yellow, red, white, the ether, or empyrean, Akasha, the sky, and light,—all of which are explained in the Pali work Wis'uddha Maggá.

It may safely be said, that however humanizing in its effects Buddhism may have been, (and it indisputably has always been so in every Eastern country where it has been established), it is of too self-denying a nature, and bears too heavily on the resources of a people to last long in a state of full vigor and purity, and in these degenerate days, revivals, reformations, convocations, and new infusions of zeal are rare or nearly obsolete.

These reformers were only revivers of the older doctrines of the Buddhas ; but the corruptions had so long prevailed that they could not be easily or completely abated even for a while, and the holy men, or brahmana, coalescing with the brahmanical tribe, their influence, although operating independently of each other, may have caused the Buddhas to have been deemed heretics by them, although, if we are to credit Fa Hain, the term would better apply to the brahmans. These last certainly were heretics from the religion they brought with them to India, if the Vedas are its expositors, and if the Buddhists professed that original faith as emigrants from Persia, so the brahmans were equally dissenters from it, and greater heretics than the Buddhists.

It is not necessary then while trying to elucidate ancient Buddhist history, to assail that of the brahmans, or to detract from *their* soaring pretensions to civil and religious antiquity. There is room for both to revel amidst the tortuous mazes of their impalpable chronologies.

It is assuredly however impossible to everlook the fact that the last Buddha was of a Brahman family, and that his father, a king, supported, according to the Mahawanso, 60,000 Brahman priests. We have no means of knowing the actual pedigree or parentage of the previous Buddhas. If what I have (following Sir W. Jones) hinted at, be true,

that the ancestors of all of the civilized people who inhabited India at Buddha's advent, were in fact all emigrants from Persia, or from some country allied to it in religion, then we might easily infer that if the Buddhists really separated themselves from the brahman, the schism must have begun about the time when they had but just arrived, if not before it, in the Punjab, that the Buddhists preserved the gods and genii which they had mutually worshipped in Persia, while the brahman, although retaining also these deities, were on the other hand diverging into polytheism—and that these Buddhists engrafted hero or man worship on their own original faith, having either become acquainted with it before their emigration or obtained it from more early emigrants then settled in India—or perhaps from subsequent emigrants from Asia west of India.

Again, how are we to account for the peculiar style of architecture of the Buddhists, and their various emblems.

The former could not, one might suppose, have been based on types handed down by the brahman, nor have all at once sprung into existence. The Dagobahs too, or Chaityas of the third Buddha Kassapa, belonged therefore to a former age—and their shape was transmitted to the followers of Sakya Buddha.

That the idea of a tomb, gradually expanded into a magnificent Chaitya or relic fane, *might* have been the natural result of man-worship established for centuries, may be readily admitted. But if the original man or hero worshippers, came from the west, then we can be in no difficulty for precedents.

This course is apparently much more reasonable than that which traces the architectural types from the east to the west.

If indeed the Buddhism of India was to be deemed the parent, as it has been by many, of western Buddhism, then it must truly have been of a much greater antiquity than has been claimed for it by its modern advocates, at least it would in such case reach beyond the historical period.

If India, as some writers have supposed, gave a religion—Hinduism in its present acceptation, it could not have been—to the western nations, or to one or more of them, then it would be difficult for us to accord with their etymological inductions, since the radicals in such a case would necessarily have appertained to an Indian language, not to Sanscrit or its derivatives, which came with the Indian races and brahman,



and apparently at a later period into India. Western Buddhism would rather seem to have had its origin in the Persian empire, or in some other region of western Asia.

The learned Wilford, in his 6th Essay, apparently deems Meru a temple to God, but says, the Buddhists consider it as the tomb of the son of the spirit of heaven, and that their pyramids, in which the sacred relics are deposited, *be their shape what it will*, are imitations of the worldly temple of the Supreme Being, and which is really the tomb of the first of his embodied forms or of his son—and also that the real place where the Thakur's bones are deposited should be unknown, to prevent profanation, as in the case of Osiris's tombs. Therefore it is said that the Thakur's bones are not placed in the pyramid, but in a small vault deep under ground at some distance from it, as at Sárnátha near Benares.\* His secret vault is called *Cúti*.\*

This practice seems to have belonged to the followers of the former Buddhas, for we find from the Mahawanso, from the accounts given in the above translated book, Phra Thom and from all disclosed I believe of the topes or Chaityas, which have been opened, that the relics were deposited openly in presence of multitudes of spectators, in a vault either in the centre of the lower portion of the spiral structure, some feet above the ground, or else in one under, or in, the middle of the foundation.

Wilford observes that “although the brahmans are not addicted to the worship of dead men's bones, still he knows one instance to the contrary. At Jagannatha, they have a bone of Krishna, which is considered a most precious and venerable relic. It is not allowed to be seen, and neither Hindus nor Bauddhas are fond of making it the subject of conversation.” It is most probable that the temple built at “the *Diamond Sands*,” stood on the site of Jagannatha, and that the heretical brahman Buddhists would, along with the mass of the people, have perpetuated the ancient veneration for the relics, but under a new name. Balas is one of the titles of Buddha but now little known. This word, properly pronounced, sounds exactly like Belos in Greek and Belus in Latin. May we not then reasonably suppose that the temple and tomb of Belus at Babylon was a monument precisely like one of Buddha, and calculated for the very same purpose?†

\* As. Res. Vol. X. p. 129, et seq.

† As. Res. Vol. X. p. 134.

The pyramids, like all the temples of Belus in India, had no opening whatever.\* I think later excavations have proved that there were entrances to the pyramids of Egypt which had been shut up. The finding of Sarcophagi under the pyramids seems to have settled the question as to their origin. The Musalmans, observes Wilfold, aver that the world is now under the 4th Buddha; Zoroaster or Zarades or Zoroades or Zarat, was the eldest Zoroaster, son of Oromazes, who was according to Lindas, "The Spirit of Heaven," and who directed his bones to be carefully preserved. He is supposed to have assisted at the tower of Babel. The antiquity of relic worship can hardly be disputed.

There were four Adams, and four Buddhas. Adam's body was entombed at his own request in a cave or vault called Alconuz, in a mountain in the centre of the world (of course the Hindu Meru), and represented by artificial hills. Adam's remains after the flood were *divided amongst his posterity*.

Let us now turn again to Faber, in his highly interesting account of the Cabiri, a great deal of which however rests perhaps on probabilities and controvertible etymologies. He says that the Mithratic *cavern* of the Cabiri, was not *always subterraneous*, but sometimes lay concealed in the *centre of enormous buildings of the pyramidal form*. Such was the Tower of Babel, which was yet standing in the days of Herodotus,† who describes it as consisting of eight towers gradually tapering to the top, with a temple at the top, and a *shrine* at the *bottom*, with a statue of Jupiter Belus, or the solar Noah. The pyramidal form was probably adopted in honor of the sun, and in imitation of the tapering flame, as indeed the very name of pyramidal seems to imply this.†

Now if the temple on the top be reckoned as the eighth story, we shall have an exact counterpart of a Buddhist Chaitya without the surmounting umbrella. The temple of Jupiter Belus, stood exactly where one of Buddha now does, in modern Chaityas in Ava and Siam. As to the above definition of pyramid, the lexicons explain the word pyramis without any such allusion to flame or fire, merely describing it as globular or cylindrical or quadrilateral at bottom, but tapering upwards, or a geometrical solid figure, whose base is a polygon, and the sides plain triangles, whose several points meet in one.

\* As. Res. Vol. X. p. 134.

† Faber's Cabiri, Vol. II. p. 384, citing Herodotus, lib. I. c. 181-3.

But if the root of pyramis, be as it seems to me, pyra, we should come at once to a simple exposition of the original intent of a pyramid, according to the Latins ; for pyra implies, and is, a *heap of wood made for the BURNING* of a DEAD BODY, a funeral pyre or pile. This at least shews that the belief of the Latins was that Babel was a mausoleum as well as the pyramids.

The tower of Babel seems to me to have been raised in honor of some great legislator, or some social or spiritual benefactor. The people of the various countries in its vicinity would, as in the cases of building Buddhist temples in after times in India, Ceylon, &c. have flocked to the spot to assist in its erection, and there would then of course have been a conflict of languages, which might have impeded the work. But it went on apparently to completion, and then the strangers dispersed. Faber says, the tower had *seven* stories, which is the number in a Buddhist Chatya.

It is very improbable that if the idea of raising Dagobas was indigenous, and normal, amongst Indian Buddhists, the latter should have hit exactly on the number seven.

If the Pali character slowly advances from a remote date until it insensibly blends itself with, or almost loses itself in the Sanscrit, then, if it did not belong to the Palis or Buddhists, or to some other ancient tribe of people, not brahmans, the latter should be able to shew their own records of the olden time, couched in that character. It would be predicating I should think a great deal, and more than facts yet warrant, were we to assume that during the many centuries throughout which this character was seemingly being wholly appropriated by people not brahmans, these last were holding that people in civil subjection. Nor is there any glimpse to direct us to the point whence the supposed heretics, the Buddhists, took the lead of the brahmans—for this must have been long before Sakya Muni's time, if we are to believe that Chaityas—which kind of monuments were never, as far as we know, tolerated by brahmans—existed long before his ministry,

But the brahmans I believe have no monumental records of Hinduism to shew of a date anterior to those of the Buddhists and couched in the Pali character. It is said they were not historians, nor given to transmitting to posterity on stone or metal any records of themselves or of other people. The truth would seem to be that, having failed to

make, or at least to preserve, any clear account of their own advent in India, they could not, while confined to the Punjab, have had much either of a political or religious nature—which their pride would have allowed them to register.

But let us turn to their debouchment on the plains of India, and we shall see that when they had at last set their feet on the necks of the Buddhists, what marvellous aptitude they displayed for the crafts of the builder, the sculptor, and the engraver.

And here again we may pause to enquire or conjecture, whence such acquisitions were derived. We want much indeed two series of drawings for comparison. One of the architectural and inscriptive monuments of the Buddhists, and another of those of the Brahmans and Hindus—arranged chronologically. That the Greeks of the Punjab taught the former the art of sculpture is highly probable, and will account for the best specimens their temples afford. This will be more probable, if, as I suspect, the best specimens of Brahmanical and Hindu sculpture were posterior to Greek domination in Bactria, and to Greek influence in the countries around it.

It may be allowed and we may reasonably believe, that India was densely peopled when the brahmans arrived on its frontier.

If this had not been the case, that tribe would not have entangled itself in the Punjab, but would have sought out pleasanter quarters on the banks of the Ganges or some part of central or southern India. That they did not do so, is proof that they feared the people then possessing India. It is not very probable then that the minority in this early stage of their progress should be able to impose their own customs, laws, and religion upon the majority. For such a consummation it would be requisite first to shew, if indeed that even would be sufficient, that the then occupants of India were a savage, unlettered, and unreligionized race or races, ready to view the strangers as demigods, and to bend their necks to their civil and spiritual domination—and to yield up their native freedom to the unmitigated thralldom of caste.

The brahmans found caste, I suspect, a social arrangement of long endurance, and only altered it to the extent of placing themselves on the highest bench. For as caste was a social system of the Persians, we must suppose the Indians, if they did come from that country, to have brought it with them.



The Buddhists recorded every notable event on stone or on metal, particularly such as had reference to religion and its royal supporters, a feature which distinguished them from the brahmins for many centuries,—and has it yet been shewn that there are Hindu or Brahmanical temples older than the sthupas or chaityas?

Can it be proved what existing language of India, written and spoken, cognate to the Sanscrit, has been directly derived from it, without reference to the Pali?

#### *Ancient Indians.*

There would be no difficulty in assigning an origin to the race or races which peopled India previous to the arrival of the brahmins, could we implicitly rely on the conclusions or suppositions of Sir W. Jones, that it was the same with the original inhabitants of Persia. His proofs and reasoning would seem to lead us in many instances to the desired haven of truth, but the former are imperfect, as he himself admitted, and I suspect not strong enough to create a thorough conviction of their cogency.

However, as I have already hinted, there is no cause why we should not suppose with every degree of probability, that the brahmins were not the first civilized people who came as emigrants from the west; and if Persia did not receive her civilization from India, as Sir W. Jones hints they did, the Indians may have obtained at various, and perhaps distantly, separated periods, their civil organization, especially that of caste, and their religion or religions from Persia. We have not certainly any thing very positive to shew that man-worship came from that country, but there were many, and apparently well beaten tracks, leading from the various nations of central and northern Asia to Hindusthan, by which that peculiar worship may have been imported.

Besides, if we refer to the above author's writings,\* we shall find that Mahabad, who was the first (at least reputed) king of Iran, and of the whole earth, received a sacred book in a heavenly language from the Creator, and "that *Fourteen* Mahabads had appeared or would appear *in human shapes* for the government of this world." "These are the 14 Menus," &c.

The manner in which these Mahabads are recorded, indicates them to have been rather spiritual superiors than mere kings, metempsychosis

\* As. Res. Vol. V.

logical personages perhaps, or Buddhas or heroes. The Buddhists therefore may have easily derived their list of regenerators or Buddhas from Persian history, or tradition carried by them to India, whether we are to look upon them as forming a portion of the emigration to the Panjab or as belonging to previous or subsequent migrations to India. Indeed, this author assumes it as a fact that the brahmans came from Iran, and that the ancient Indians and Persians were Hindus, or in other terms, Cusians, or Casdeans or Scythians, who had established a powerful dynasty in Persia, and whose history had been engrafted on that of the Hindus of Udyodhya and Indraprestha. But this latter supposition only embraces one or more partial emigrations from the west. The whole of India and its shores south of the Gangetic Provinces are not here accounted for, and the variety of tribes which now people that area, exhibit a considerable difference in their physical developments, hence a wide field is opened I suspect for research. That the emigrations to upper or N. Western India were by land, can hardly be doubted, and their progress may have been *gradual*, for architectural remains in the regions intermediate betwixt central Asia and India are supposed, and with, I think, much probability, to exist, if found, to attest these last suppositions. But it appears I think equally probable that emigrations to the coasts, and their inclosed areas of India, took place by sea.

If emigrations had taken place from Persia or any other focus in central Asia, to India, anterior to the arrival of the brahmans, they too must have brought with them the religions prevalent at the respective periods in the parent state. But have we any architectural remains, *unconnected* with Brahmanism or Buddhism, which can lead us to conclude what these religions if any, were,—assuming here for the sake of elucidation, that Buddhism was indeed posterior to Brahmanism. It is to be conjectured, not—unless the Pali comes to our aid.

It is difficult to resist the conclusion, after a perusal of Sir W. Jones' arguments, that "the brahmans came directly from Persia." If this position could be distinctly proved, the period might, with tolerable precision, be fixed, when they did arrive; by a comparison of their religious dogmas, as they exist in the Vedas, and in the religion which prevailed in Persia when Zeratust, as Sir W. Jones informs us, had added to the Sabism and fire worship of Kyumers, which were perfected by Hushang,—the new family of Genii or Angels, and also new

ceremonies for the adoration of fire, while at the same time they might be supposed to have still retained a belief in the theism which originally prevailed in Persia.

This would perhaps throw back the date of their emigration to a period preceding Zerasht, for this reformer had gone to India to gain instruction from these very brahmans in theology and ethics; thus perhaps evincing his knowledge or belief of their having carried these sciences from Persia. This date might be fixed somewhere betwixt B. C. 800 and the advent of Zerasht.

Sir W. Jones does not in the essay I have been alluding to notice the Pali character or language. But if the Sanscrit, as he states, can be traced, and, in a great measure, identified with the oldest languages in Persia, then both the character and idiom of the Pali may perhaps be followed up to the same source through a separate channel.

Much philological acumen will be required to fix the precise relations in which the Deri or refined Parsi,—the Pahlavi and Chaldaic, Assyriac, Zend and its Awesta,—the Pracrit, Sanscrit, and Pali stand towards each other. But until this shall be accomplished no sound reasonings or deductions can be made regarding their precise ages, nor that of the races who employed them.

I am not aware that the foregoing writer's position, that the Parsi and the various other Indian dialects were derived from the language of the brahmans, has as yet had the confirmation of the learned in Europe; although it be still one which has the support of some orientalists.\*

If etymology could be tolerated in a subject like the present, the words Pali and Bali might be supposed to have sprung from D. Herbelot's Pahlavi and Pahalevi—or from the words Pahali and Bahali, which he says the Persians used indifferently.

If the character which has been so felicitously and ably traced back by Prinsep and Dr. Mill to a remote period through all of its proteous forms, be the Pali, let us then be told how and when it branched off from the Sanscrit, and why it was kept distinct.

As the transitions of the Pali went on, each successive one may have left that one which preceded it to be employed for recondite purposes. But if latterly the Maghadi was not the priestly or exoteric language,

\* As. Res. Vol. II. from p. 49 to 64.

where shall we look for it, at least before Sanscrit became the language of the Buddhists? If the Pali and Sanscrit characters be originally the same, then the antiquity of the brahmans in Hindustan would either be thrown back to a remoter period than orientalists might be disposed to admit, or the brahmans would be considered as a colony which had imported with them to that country a form of the same character used by the earlier occupiers of it, and which from having arrived at a more advanced stage of improvement than the Pali, gradually superseded it, while the Sanscrit *language* took the place of the Magadhi for a similar reason.

The primeval worship of Hindustan may have been that of demons, spirits and genii, being that natural religion, which in every age and under every stage, from savage life up to the dawn of civilization, has been the result of fear, and of the instructive impulse towards the preservation of life.

It is very probable that the mental obscurity was first brightened by emigrations from the west, at periods long antecedent to the arrival of the brahmans, and that the latter may have pursued the same track. It is hardly possible that any emigrants from the west, however differing in the periods of their arrival, should not have had something common in their civil organization, religious dogmas, and metaphysical subtleties.

Thus it appears to me easy to account for the Buddhists having in their system of religion the earlier gods of the brahmans, Brahma, Ishwara, Indra, with a similar train of Devatas deities probably venerated under other names in Arabia and Central Asia. I allude to Sakya Buddhists, for of previous Indian Buddhism we may be said to be almost totally ignorant, unless we can prove that some of the volumes of Buddhist theology which now exist were extant before Buddha Sakya's advent.

The corruptions of polytheism seem to have begun amongst the Indians long before Sakya's time; and to have modified Buddhism. This last took shortly after his death a more corrupted form; not that of simple hero-worship, which it probably was at first, but as that of a man converted into a demigod.

We have only to turn towards the west to be convinced how prone all the nations of antiquity were to man-worship in the first instance, and to that of his apotheositical form in the second. But there may



be a prebias in the human mind to deify, as there certainly is a predisposition in the minds of the *mass* to venerate, great benefactors to the race, and therefore these separate feelings may operate independently in any country, although the objects of them are more likely to be borrowed by infant nations from those further advanced than themselves, than to have been indigenous.

I do not know why it would be necessary to go to such a distance for the ancestry of the natives of India as the learned Bryant does, nor do I know the positive grounds, if any, on which he founds his assertions that the Hindus, alias blacks, came to India from Shinar, and that they are believed to have been originally Scythians or Cuthites, the posterity of Ham, from Chus, his son ; and that they settled on the Indus, and *subsequently migrated to Ethiopia* above the Cataracts. I apprehend however that by Hindus the brahmans alone are meant, and the inattention to the proper distinction betwixt the terms Hindu and brahman, is apt to create misconceptions. Brahman could hardly have been the original name of the tribe, but one imposed on them by the Indians when they arrived, being worshippers of Brahma.

But the better informed Wilford on such points tells us that there were two tribes of this people, the Canyacubja or Canoje brahmans, and those from Sacadwip, called Saca or Sacalas,\* while the brahmans admit generally that they settled in Canoje. If it could be *proved* that any of the race first came from the west and settled in or near the *delta* of the Indus, the above origin assigned to them would be rendered more probable, or in other words, less improbable than that of their having proceeded directly from Shinar.

The Siamese divide the brahmans into two tribes also ; Bryant indeed says that they occupied the country on the banks of the Indus,—the Sinthus of the Periplus,—Guzerat or Juzerat, or Cutch,—Cambaia or the Bay of Cham, and that they were Lords of the sea, or Palæ Semunder the sea of the Pali or Selandwe or Serindeb or Singhala Dwipa, or Seilan or Ceylon. But it is known that brahmans *descended* from the Punjab and settled at the mouth of the Indus, and I think it probable that from thence they prosecuted voyages to the eastward in concert with Arab navigators.

After all however, it is certain that we have not far advanced in the

\* J. A. S. B. Vol. IX. pp. 40—74.

investigation of the ancestry either of brahmans or the more original tribes or people of India, since the day when the revered founder of our Society electrified the world of letters by his speculations, and his keen and logical discourses on Asia, in its widest sense. A rapid glance at some of these profound essays or discourses will perhaps shew that until we can produce adverse facts, we shall have to rest, whether contended or not, with what he has laid before us regarding the ancient civil, political, religious and literary history of the brahmans and Indians. He sets out by informing us that “the first Indian monarchs can *hardly be supposed* to have reigned less than three thousand years ago.—Of course there is no proof of this position.

“The Dabistan describes a religion called Hushang, which was long anterior to that of Zeratusht, and several of the most eminent of the Persians, dissenting in many points from the *Gabrs*, and persecuted by the ruling powers of their country, retired to India, where they compiled a number of books now extremely scarce; (then) further, that a Dynasty termed Mahabadian (q Maha) had been established for ages in Iran, before the accession of Kayumers.\* Hence,” adds Sir W. Jones, “the Iranian monarchy must have been the oldest in the world.” It seems to me that if these emigrants were brahmans or men who afterwards assumed that name, we ought to find the earliest brahmanical worship to correspond with the religion of Hushang, which supplanted the ancient religion of Iran or Deism. The Vedas sufficiently attest that the first brahmans were sun and fire worshippers, yet perhaps retaining faint perceptions of the ancient Deism of Persia, which had itself been debased by polytheism, and thus affording a nucleus around which they could weave their own tangled and plural system of gods and energies, male and female.

“Every just and benevolent man, whether he perform or omit these (ceremonies) is justly styled a brahman.”† Thus the Vedas gave no religious superiority to brahmans.

But the sun was that “great effulgent power which is Brahma himself, and he is called the light of the radiant sun. It is the greatest of lights, and is the principle of life in all beings.‡ The sun, says Yajunyawalcya, is Brahmé, and this is a certain truth revealed in the *Vedas*.”§

\* Sir W. Jones’ 6th Disc. on the Persians. A. R. VI. p. 48, et seq.

† As. Res. Vol. V.

‡ Ditto ditto, p. 349.

§ Ditto ditto, p. 353.

The sun is the *eye of the universe*. There is none greater among the immortal powers. From him the *universe proceeded*, and in him it will reach annihilation. It is the three irradiating powers, or forms, Brahma, Vishnu and Rudra.\*

The Malays derived from the Hindus, I suppose, their name for the sun, *mata hari*, the eye of day.

“The court language of Iran about Mohammed’s time, and when Anusharavan sat on the throne of Persia, was called Deri, while that of the learned was named *Pahlavi*. The former was only a refined and elegant dialect of the Parsí.

Besides these, there was a *very* ancient and abstruse tongue known to priests and philosophers, called the language of the Zend, because a book on religious and moral subjects had been written in it. That is, the character was the Zend, and the language Awesta.

Hundreds of Parsí nouns are pure Sanscrit, and very many Persian imperatives are the roots of Sanscrit verbs.” The corollary or deduction made from these facts does not yet seem to have been adopted by the learned, “that the Parsí was derived, like the various Indian dialects, *from the language of the brahmans*.”

If the brahmans came from Persia, it is more likely that *they* should have brought the Parsí, or the Pahlavi along with them.

But “the Zend bears a strong resemblance to Sanscrit, and the Pahlavi to Arabic.” Hence, according to this assumption, the brahmans brought the Zend with them.

Could any of the characters of the ancient inscriptions decyphered by Prinsep be traced back to one of these Persian Alphabets, as they have been formed into Sanscrit? “The Zend language was at least a dialect of the Sanscrit, approaching perhaps as nearly to it, as the Pracrit, or other popular idioms, which we know to have been spoken in India two thousand years ago.”

This date would fall about the period when it is *probable* the third Buddha Kassapo may have appeared.

“The oldest discoverable languages of Persia therefore were Chaldaic, from which Pahlavi was derived, and Sanscrit, and when they had ceased to be vernacular, the Pahlavi and Zend were deduced from them respectively, and the Parsí either from the Zend or immediately from the *dialect of the brahmans*. But all had perhaps a mixture of Tartarian.”



Where we have no unbroken clue to guide us, the truth cannot be indisputably established, and it seems meanwhile more consistent with the plan on which learned investigations in our days are carried on to consider the Sanscrit, or its parent language and character, to have had their origin in Persia, or in any other region where the Zend had prevailed.

“The primeval religion of Iran was a pure deism.\* That which succeeded it was Sabian.”

In the first we find that in addition to the inculcation of the belief in one supreme God, maker and continual governor of the world—in a pious fear, love and adoration of him, and a due reverence for parents and aged persons, and a fraternal affection for the whole human species, it is enjoined to *have a compassionate tenderness even for the BRUTE CREATION.*

This last injunction is a prominent one in the Buddhist creed, but has no place in brahmanism or sacrificing Hinduism.

If the brahmans did emigrate from Persia, then it appears to me, as I have already stated, that it must have been after—but not long after—Sabianism had become the popular worship—because the brahmans were originally, as settlers in India, if we are to judge from their earliest books, Theists, and Sabists combined—for if they did not publicly worship the Host of Heaven they venerated the sun and moon, and perhaps other celestial bodies. But at what period the Sabians took precedence of Theists in Persia does not clearly appear, or we might perhaps fix the period when the brahmans arrived in India. The brahmans and Persians both worshipped, as many of the former now do, *fire*. But I apprehend that the Hushangites, who fled to India as above quoted, probably formed a *distinct sect there from the brahmans*, and retained longest the Unitarian doctrines. Sir W. Jones deemed the doctrines of the Zend to be quite distinct from those of the Vedas.

“Thus it has been proved by clear evidence and plain reasoning that a powerful monarchy was established in Iran long before the Assyrian or Pishdadi government. That it was in truth a *Hindu* monarchy, though any may choose to call it Cusian, Casdean or Scythian—that it subsisted many centuries, and that its history has been engrafted on that of the Hindus, who founded the monarchies of Ayodhya and Indra-

\* As. Res. Vol. V. p. 58.



prestha—that the *language of the first Persian Empire* was the mother of the *Sanscrit*, and consequently of the *Zend* and *Parsi*, as well as of Greek, Latin and Gothic; that the language of the Assyrians was the parent of the Chaldaic and Pahlavi, and that the primary Tartarian language also had been current in the same empire, although, *as the Tartars had no books or even letters*, we cannot with certainty trace their unpolished and variable idioms.”

In this paragraph the brahmans and Hindus appear to be blended into one people. The present Tartarian alphabet is plainly derived from some derivative of the Sanscrit; Iran or Persia is the common country (it is continued) from which migrated the Hindus, Arabs, and Tartars; and it is considered highly probable that the Britons came from Armenia, the Goths or Scythians from Persia, and the Irish and old Britons from the borders of the Caspian.\*

“The Hindus, Chinese and Japanese proceeded from some ancient stem distinct from the Arabian and Tartarian one. But all the three stems may be traced to Iran, as to a common centre, from which it is highly probable that they diverged in various directions about 4000 years ago.”†

However delightful to the imagination these speculations may be, we must, I fear, for want of clear demonstration, resume our stand on the threshold of induction.

In some such terms then as the foregoing, the respective claims of brahmans and Buddhists might be consigned to abeyance, until the learned should have decided upon them by an induction from all the facts which history and research can afford, and the claimants be allowed to revel in the meantime amongst the sweets of antiquity respectively.

But I cannot resist the temptation which Dr. Roer's lucid exposition offers, for making a few concluding observations on the discussion in question, and in so doing I will follow up the arguments by which he wishes to convince us that the brahmans have won the field.

He observes that through M. Burnouf's researches we have returned to the central source of the Buddhist writings, from which all others, *with exception of the Pali*, are only radiations.‡ This position

\* As. Res. Vol. II. Disc. on Hindus. † Ditto ditto, on Chinese p. 381.

‡ No. CLXVII. J. A. S. B.

we could wish to see placed in a clearer light; and to have the Pali allotted its definitive position in Indian theology and literature. He admits or reports that the language of the Sanscrit books on which M. Burnouf's learned work rests is barbarous. But we would also desire to learn their earliest dates and those of the character (or characters) in which they are written, so that a close and rigid comparison might be instituted betwixt that language and character or characters, and the Pali and the language it clothed. The most barbarous of the two in both of these respects might perhaps seem entitled, after such a scrutiny, to claim the preference. If the Pali and Sanscrit were alike barbarous at any given period, the brahmans could claim the merit of having brought the latter quickly to perfection; that the Buddhists, fond as they were of recording their religious history in the Magadhi, were induced at last to adopt it; although perhaps this may have been partly owing, as I have before noticed, to heretical innovations.

If the Sanscrit and Pali character and language should be found to have been the same originally, then we should have one clue to trace Sanscrit to its fountain, namely, the most ancient specimens of Pali extant.

We are still, I think, deficient in proofs that "the Buddhist religion overcame that of the brahmans, on its *own ground*." It might rather be said that the former outstripped the latter in the race—for there was no hostility apparently betwixt the followers of either, but rather a philosophical and polemical rivalry, which did not, until a long time had elapsed become debased into a mutual virulence and hatred.

It is asked, if Buddhism has been able to overcome the intellectual barrier with a great number of the Hindus, the tenacious adherence to their religious impressions—and also why should christianity not be able to exercise a similar influence over the Hindu mind?

To answer this question we require a much more correct knowledge than we now possess of what the Hindus and Buddhists, particularly the former, really believed and practised in ancient times. The Hindus of those earlier days were not trammelled to the pantheistic car, which they now so painfully, although willingly, drag along. Hinduism then was not transcendental, but an incipient monster with undeveloped energies, neither prepared to compel veneration nor to attract it, by diffusing around itself a false glare and splendour. Besides, the Buddhists and Brahmans had one or two connecting links. Both had appar-

ently worshipped the same God and Genii originally—if not up to the very period of their dividing in doctrine; and the Buddhists still retained these Genii or Devatas, in their theogony, although divested of the superior potency formerly accorded to them—while both had lost sight of the supreme Ruler of the universe. Numbers of the Buddhist Priests too were brahmans—and some of these were learned in the Vedas, containing doctrines which all the people who emigrated to India from ancient Persia must, during a certain period, have known and followed.

It can be little matter of wonder then, that multitudes of the people should have followed these converts, much less so if these were priests—and I have not met with any mention of a regular brahman priesthood at the time when Buddha the 4th, preached his doctrine. But it is evident that the first converts at least were brahmans—men well versed in brahmanical learning, as all the learned Buddhists appear to have been from the earliest times of which any Buddhist records remain, and were led to adopt Buddhism from a conviction of its merits, founded on open discussion and a rigid comparison betwixt these and those of their own dogmas. If a few brahman priests of acknowledged sanctity were at the present day to expose the falsity of Hinduism, without being persecuted for so doing, and to preach the *moral-ity* of christianity, as Buddha did that of some foregoing *Indian* system,—we may suppose that the faith of the multitude would be shaken, and that numbers would separate and follow the new apostles, even although the fetters of superstition are much more firmly rivetted upon them now than seem to have been those which shackled the Hindu of B. C. 543. For one God worshipped then by the Hindus, they have now tens perhaps.

A new Avatar if now promulgated by the *brahmanical priesthood*, acting in concert, would probably consign the whole of the Hindu Pantheon to Naraka.

But these men, supposing even that they are not sincere in their present belief, have no worldly motive, nor are likely soon to have one, for repudiating their gods. There are no christian kings, and Adhi Rajas, at whose right hands they can sit as counsellors, astrologers or priests—the door of ambition is for them but narrow, and the objects which at best could be gained were it laid widely open are, when



put in comparison with their former actually enjoyed, moral and political ascendancy, paltry. Further, it appears from Dr. Roer's critique that "the Sanscrit words in the Nepal records have often acquired new acceptations."—Q. May new ideas not have followed?

"Buddhism," observes Dr. Roer, "is no primitive religion, but one of those which are founded on the development of preceding religious opinion." Granted to a certain extent.

I have already quoted some authorities whose opinions regarding the Buddha of the west have, when combined with what we know of the religion as it existed and exists in the east, led me also to nearly the above conclusion. I mean that the Buddhism which was re-established by the ministry of Gotama Buddha, was one which originated at some undefinable period before his advent, and that it was attempted to be engrafted on Brahmanism (at a more recent period) however, under the form of a moral improvement, and also that the authentic records we yet possess, do not clearly define the *original* line of separation betwixt Brahmanism and Buddhism.

It appears to me also that the Hero worship of the west was at some remote period propagated in India by emigrants from thence, as well as the worship of Devas, corresponding to the primitive deities of the brahman, and that this idea was first subsequently adopted by the sects of philosophical moralists, who being desirous of perpetuating the names of the prominent reformers, gave each of them an apotheosis, and then raised Chaityas and towers over their relics on models handed down to them from ancient times.

It is obvious that we are as yet quite in the dark as to who the people were who inhabited India before either Brahmans or Buddhists appear on the stage of India.

Even should it be proved that Brahmanism is older than Indian Buddhism, it will not follow that Hero worship was not still more ancient, not only considered generally, but with special reference to India. It is easy to perceive how the adoration of a man can be an after-thought and have no material connection with his doctrines, which last may have been handed down to his age from one far anterior to it.

In the wide range of religions where shall we find an original one? Such superstitions as are the results of natural impulses or the markings of fear or the airy forms bodied forth by the imagination and incipient



reasonings of infant races, are of no account here, however interesting to the natural and moral philosopher, became traceable both to natural and moral causes. All the ingenuity of antiquarians has not yet unravelled the tangled skein of religions. Possessing many features in common, still how various do their sources appear to be—or if traced back to what seems some common point, how suddenly are they found to diverge again ;—what blending of their dogmas, what perversions, what improvements, what grand conceptions, what debasing and demoniac ideas and creeds,—what asceticism—what grossness—what epicurianism do we not find almost blended together. For the primitive religion we must go back to the first days of man. The question, observes our author, put by the brahmans to their opponents, why Sakya Muni did not appear in any former period, was cut short by the doctrine that the universe always is under the government of a Buddha.

But it is probable that they also replied, that three known Buddhas had preceded this one, and they might, and perhaps did argue, that [like the Jewish prophets] each successive Buddha succeeded to the mantle of his predecessor ; and that these Buddhas were separate identities, and not avatars of a single person, although *each* Buddha became in fact according to the doctrines, an incarnation of himself under a new condition of existence.

The Buddhist religion doubtless appertains to “an advanced stage of society,” and so *did* brahmanism. But this does not materially affect the comparative antiquity of either of the opposed parties, unless one of them can be proved to have emanated from the other. But if this religion be distinct from brahmanism, it may have been either gradually evolved during the advance of society, or borrowed at once from a more highly civilized western one.

In the first instance it would be vain to endeavour to trace it back to its original elements. The other may or might yet be traced, could we discover any records of the first intercourse betwixt the people of the east and west. As India was quite well known to western nations [at least by name] about the period of Buddha Sakya, and B. C. 623 to 543, we may admit the probability of a much earlier intercourse betwixt the two.

Hinduism, as it now exists, is a new religion, and so comparatively is or was brahmanism, if it was a shoot from a western one, whether Persic, Chaldaic or Scythic.

In the Vedas the sun and sky were worshipped, and Sir W. Jones\* acquaints us that the popular worship of the Persians under Hushang was purely Sabian, having succeeded to pure Theism.

It is hardly necessary perhaps to speculate deeply as to where the brahmans obtained the ideas of their later gods.

In the year of Christ 50, there were astrologers from India practising their profession at Rome, and in the first *centuries* the Hindus (q. brahmans rather) sent many embassies to the Greeks and Romans, and some of these reached Spain, Alexandria, and Egypt.†

The term first centuries is somewhat vague, but it may still permit us to suppose that the pantheistic rabble of the Hindus had not then been created, and the Greeks, Romans, and the people of Egypt and other countries they visited may have supplied them with the conceptions, which they afterwards matured. Nay, we do not know that the earliest Indian travellers were not those men who were then or who afterwards became Buddhists. Buddhism was general throughout India very *long before* and during the first centuries, and its votaries being imbued with a spirit of inquiry, it is more likely that they should have travelled to the west than that brahmans should. Dr. Buchanan acquaints us that certain Jain tribes affirm that they came from Arabia. This may be true, and we may suppose that they brought with them the worship of Brahmá, and perhaps of the other gods of that country, for they were not *then Jainas*, these being a heretical *Buddhist sect*, although it is possible they may have been originally hero-worshippers. This emigration, if true, would support the ideal or theoretical case I have already proposed. "To this day," (1811) observes Wilford, "there are certainly followers of Brahmá, and brahmans in Arabia, where many old names of places are Sanscrit or Hindí.

Wilford observes that "the Mahrattas, a numerous and respectable tribe of brahmans and Khatris, are acknowledged all over India to be foreigners from the *western parts of Persia*, who left their native country not 1200 years ago," (before 1811.) Does this not shew that they only followed a long beaten road; and if it be true, it bears me out in the supposition that emigrations from the earliest ages fled to India from the horrors of war in the west, or from the love of change. In A. D.

\* Tr. A. S. B. Vols. IX. and X. p. 99.

† Ditto Vol. X. p. 99, 100.

‡ Ibid, 98.

\* Ibid, Vol. II. Disc: the Persians.

500, the Roman Exarchs or Governors were obliged to fly from Syria to India, and certainly by sea, as the Romans were at war with the Persians to escape from an invasion by the king of the Hemiarites. Wilford assures us also "that so early as B. C. 189, or before it, Hindus of both sexes were not uncommon in Greece: that they were settled in Colchis, and that the Sindi of Thrace came originally from India. The Indus was so named from a Hindu Mahant who fell into it during Manhius' expedition at the above date and was drowned." The probability, I will venture to say, is that the river had originally that name, or one very like it, and thence those who dwelt on its banks were called Indus, but long subsequent to the location of the brahmans there.

The constant intercourse which from a remote period had been kept up betwixt India and the western nations, was put a stop to by the advance of Mahometanism.

The embassies from Porus to Augustus, and from Pandion king of the southern parts of the peninsula, sufficiently attest the intercourse 24 years B. C. at least.\*

It is difficult at this day to determine who the people called Hindus by the *westerns*, were. The brahmans occupied the banks of the Indus and Cutch, and all western foreigners must, when approaching by land or by coasting the shores of India, near to the Indus, have encountered probably and chiefly men of the tribe of brahmans.

It is a question who were these early Hindus. It is more than probable that they were Buddhists, for, as Wilford observes, ancient travelers make no mention of the monstrous statues of the Hindus. The historians of Alexander take notice of the Sibœ carrying among their standards the image of Hercules, whoever he was.†

This, if not a statue or representation of a Buddha, was at any rate one of a hero, or famous man, for these statues mentioned by Philostratus as having been cut out of the rock beyond Hurdwar, had nothing monstrous in them, any more than those made by Grecian artists in the Punjáb.

If it was with the brahmans that "a regular trade was carried on from the accession of the Ptolemies to the throne of *Egypt*, to the conquest of that country by the Romans, and which did not cease until the middle of the 7th century, when the growing power of the Musalmans put a stop

\* As. Res. Vol. X. p. 109 et seq.

† Wilford, As. Res. Vol. X. p. 111.

to it,"\* and if we look to the fact that the brahman tribes were most probably subjects of the Greek kings of Bactriana who ruled, according to Wilford, the countries on the banks of the Indus as far as Sirhind, during a period of 129 years,—from 255 to 126 B. C., and if we also advert to the intercourse the brahmans must have thus had with the people of Egypt, and with all the ancient countries west and N. W. of India, we shall have no difficulty in accounting for the mythological medley which brahmanism, and, now, Hinduism present.

The bent of the brahmans towards traffic in the early stages of their progress in India shews that they were by no means a religious tribe. It appears to me that it was from Surat and Gujerat or Bombay that the first brahman merchants penetrated to China, which must have been, long perhaps, antecedent to A. D. 414, when Fa Hian sailed with them to that country. But the natives of India generally were attached to trade, although those who resided on the western coast of the peninsula, and on the W. and N. W. frontier of India, doubtless became the first traders with the western nations.

The features which were common to the gods of Greece, Italy and India, have been so forcibly delineated by Sir W. Jones, that speculation as to their general identity seems quite superfluous. He has not decided to which of all these the priority is due. But he himself, and many others, have shewn the resemblance which the Egyptian deities had to the gods of these three nations,—one which could hardly have been fortuitous, and he was the first to disclose the close connexion which existed betwixt the ancient Persians and the brahmans. Persia too was well known to the Greeks and Romans,—from all which, and from the consideration also that we have every reason to believe that the Pantheons of these two last nations were erected before the brahmans had fairly plunged into the vortex of idolatry, it might be surmised that the Greeks and Romans took the lead. But this would not prevent us from also believing that an interchange took place in the gods of the three people, or rather perhaps a reciprocal modification of them, after the direct intercourse betwixt Greece, Italy, and India had been established. It appears that the brahmans and Buddhists were always ready to learn the arts, sciences and religious opinions of the Romans, and the latter we know were ever prone to adopt and incorporate foreign deities into their system.

\* Wilford, *As. Res.* Vol. X. p. 114.



And as to the Hindus generally, they had an immemorial affinity, observes Sir W. Jones, with the old Persians, Ethiopians and Egyptians, the Phenicians, Greeks, and Tuscans, the Scythians or Goths, and Celts, the Chinese, Japanese, and Peruvians.

For many centuries after the conquests of Alexander, there seems to have been an eager desire in India for foreign arts and sciences, curiosities, instruments of music, wine, and even beautiful women. Those who desiderated such objects however were not Buddhists after Sakya's taste, and must have been either brahmans or people from some other body of Indians. If the Greeks made statues while in the Punjáb, the brahmans may have adopted the gods or heroes there represented. For many interesting facts respecting the ancient intercourse betwixt India and western nations, Col. Wilford's learned Essay V. (Vol. X. T. A. S. B.) may be consulted.

The gods and devatas, who still grace the 22 heavens of the Buddhists must, if we believe and can prove that the latter were a heretical offset from brahmanism, be the same as those worshipped at the period of the separation of the two sects, by the brahmans. This would serve to fix the date in the above supposed case.

But I cannot suppose that the chief of these Devatas, Indra, was born out of India, although some foreign ideas may have been mixed up with his history.

From the following extract from the Milinda Raja, the qualifications of Indra might have entitled him to Nirvana. His apotheosis however had a lay character, rather than a religious one. He was doubtless the ruler of some powerful empire, the capital of which was perhaps termed Meru, which name, after his Dynasty had passed away, remained as a mythological region.

#### *The seven names of Indra.*

1. Maghawa, which appertained to him while yet a holy man in this world.
2. Burinthatho, when he was in the full exercise of the virtue of charity.
3. Sakko. Because of a benignant and humane disposition.
4. Wasawo Phalawo. When he built houses for the poor and was in other respects munificent.

5. Sahassa Netto. When he had become perfect master of *one thousand Pali* works.

6. Suchampati. When he was married to Suchida Nari.

7. Dewanna Mintho. When having finished his actively virtuous life on earth, he ascended to Tawatinsanang, and became the ruler of all the Devatas in that heavenly region.

*His Consorts were :—*

1. Suchita—celebrated for the gardens she formed. She made one Nandawana 500 yojanas square.

2. Sanantha,—famous for the wells and tanks dug by her orders.

3. Suthamma,—who erected Caravanserais and other buildings for travellers, and also affixed spires to Dagobas, these first being five long cubits in length (or height 30 feet.)

4. Suchada,—renowned for her virtue.

Indra is also called Sakó—Purindadó—Dewa Rája.

Wajirá Paní—Sujanpatí.

Sahassakó—Mahíndó.

Wajirawudhó—Wasawó.

Dassasatta Ñāiyanó—Tiduwadibhúí—Suranathó—Wajirahathó.

Bhutapatí—Maghawá.

Kosiyó—Indó—Wassaghú.

Pakasassanó.

“The native country of Buddhism is India—and as there was no other religion but brahmanism, *this* must have been its parent.”

If this shall be proved it will not perhaps be difficult to shew what *that* form of brahmanism was to which it owes its existence. As I have not met with the proof of this position I beg to suspend my own judgment. But it is my steady opinion that the worship of a *man*, which is the coping-stone of the *present* Buddhist system, as it could not have been derived from the brahmans under any view of the subject, had either very long indigenously prevailed in India, or had been brought from the west, some time prior to its being generally adopted, I apprehend that both religions were originally based on the deep abstraction of infinite power, and illimitable intelligence. But we have not sufficient means for tracing the changes which the Indian mind underwent from the period of the 1st Indian Buddha, perhaps three or four thousand years ago, up to the 4th Buddha, or how many theolo-

gical theories may have been alternately accepted and rejected during that period.

M. Remusat seems to have believed that Buddhism travelled from the banks of the Ganges to central Tartary—in the neighbourhood of the lake Lob,—amongst the Ouigours—at Khotan, and in all the small states to the N. of the Himalaya mountains—also in Affghanistan—Oudyana—Gandhaza, &c. But was there not a germ, if not a fully expanded blossom of this religion existing long before away towards Persia and Turkistan? Buddhism, he also observes, [the Buddhism I suppose of Sakya he means, originating in central India, between the mountains of Nepal and the rivers Jumna and Gogra] was carried back by tradition as far as the tenth century before our era—and monuments of which still subsist, and the others now in ruins, confirm the testimony of these traditions.\*

It would be satisfactory if we could discover a solid base for the latter supposition—for I am not aware than any of the decyphered Pali or other inscriptions will carry us back so far.

He then, in his 6th head of facts, states, that “we are satisfied that Buddhism had penetrated into the Dekkan in very ancient times, and there exist there from that period excavations in the form of temples, the construction of which is carried back to epochs so remote as to be comprised within the age of fable.

It would, as supporting my argument, be rather gratifying to us to find these assumptions confirmed—but until the full and solid grounds for them are exhibited, it will be prudent I think to withhold our assent.

M. R. first says (head 5) that Buddhism had penetrated to the mouths of the Ganges A. D. 500—as if it had only been then able to get so far from its source in the N. W.; and if his sixth position be correct, then the Buddhism of which he sees traces in the Dekkan, could not have been that which Sakya promulgated, or rather which he is believed to have originated—but may have been a prior stage of Buddhism—that of one of the three Buddhas before Sakya.

He goes on to say that in Fa Hian’s time the Ceylonese counted 1497 years since the Nirvana of Sakya Muni.

Now the Mahawanso of Ceylon declares the period of the Nirvana

\* Lieut-Col. Sykes quoting M. Landresse, Tr. R. A. S. Vol. XII. p. 256—7 et seq.

to have been in B. C. 543, and Fa Hian was in Ceylon in about A. D. 410, so that the first of these Nirvanas was in B. C. 1087. Lieut.-Col. Sykes, who quotes M. Landresse in his account of M. Remusat's researches, shews\* that the circumstances attending Sakya Buddha's early career—his ministry, and preaching, his death, and the belief of his followers, all tend to induce a strong belief that there had been Buddhas preceding him, while Fa Hian positively asserts that a large tower in Oude contained the entire bones of Sakya Muni's immediate predecessor, *Kasyapa*.

M. Burnouf's sources of information are two—the Sanscrit Buddhistical works of Nepál, and the Pali or Magadhi works of Ceylon.

It appears to me that Sanscrit was not employed by the Buddhists to record events until a period when heresy was rife, there being no less than 22 sects. Now it remains perhaps to be proved that the Buddhism introduced into Nepál, and the Himálaya, was not that of one of these sects,—was not propagated by men originally brahmans, and who were retrograding towards their first faith, or rather rapidly framing another. He was tempted with every kind of gratification by a Rakhsha or demon to abandon the priesthood, but resisted. He had also the special gift of being able to walk upon the waters, and Devils were afraid of him. I do not see how the *dates* of these Sanscrit works therefore will yield solid data for a summing up, although they may greatly aid investigation. A comparison of the substance of them with that of the Ceylonese Pali books may do so. But if any suspicion shall seem necessary in regard to these Sanscrit MSS. I cannot understand how the ancient elements of Buddhism are to be sought for in what is common to both these classes of books, for it was as easy for the writers in Sanscrit to omit what was foreign to their purpose, as it was for the brahmans to falsify and suppress in the manner they did, the records of Buddhism which fell into their hands. Scynthianus, who had studied at Alexandria about B. C. 190, visited India by sea and brought back *four books* :† what were they? The Vedas most likely.

It is curious that Buddha did not write any thing himself—like Christ and some of the Prophets, he preached the doctrines leaving to his disciples the task of editing it. We have therefore no means of

\* Tr. R. A. S. Vol. XII. p. 261.

† J. A. S. B. Vol. IX. p. 215—217.



knowing whether this task was faithfully executed, and it was, we may suppose, from the different versions given of that doctrine, that heresies arose. Francklin, in his essay (p. 12) observes that when Buddha was about to die he is said to have addressed his followers to this effect:—

“That what he told them about spiritual affairs and a future *state* were mere allegories, as there are neither rewards nor punishments after this life.” I have never during my intercourse with the Buddhist priests heard any such a recantation even hinted at—quite the reverse. And indeed it must have, if it was ever broached, been one of the heretical doctrines, for it is upon the metempsychosis and a future state that the whole Buddhist system hinges, and by which its moral maxims are enforced. But I find something analogous to the above in the Ratana Kalapa, under the head Mára, who was the King of the Maras, and who persecuted Buddha, but was defeated, so that people who act wickedly are likened to the Mára.

‘Buddha said that there is no Yama or king of Naraka (Hell) but that the wicked see him in their minds’ eye only.’

Yama Raja Pathamang Dewadutang—Sámanusasetwa.

In one of the versions of the Milinda Raja in my library, it is stated that there were six Múnis—Purana Kassapé—Makhali Kosa (Ghosa) Niganda—Nataputo—Sunjoyo Wélattha Buddhó—Ajiwókesa, Kánbalo and Pakúddho.

Milinda then visited Purana Kassapé and asked him to inform him who was the protector of the world? The priest replied, the earth, or ground. Again, by what power will souls be precipitated into hell? To this question there was no reply. Therefore Milinda reflected that there were no wise and learned men in Jumbo Dwip. Pursuing his questions, he asks, will the good actions of men be rewarded and the evil ones punished after death? Answer, neither—but as the mortal is here, so in every way will he remain hereafter the same. Milinda—Will this take place or be, where the individual may happen to have been maimed accidentally or for crime? No reply.

After this there were no wise men in Sagal for twelve years, and if any Arrahans appeared before the king he drove them away. When that period had elapsed, it became known that a great assemblage of krores of Arrahans had taken place in Himala at Rakhita-thalla, and that their superior was Assagutta Thero. These persons then proceeded

to the mountain named Yuganthara, in order to arrange about having a learned discussion with Milinda Raja. The question had been thrice put to the assembly, that a polemic champion was wanted, but no one stepped forth. The Superior then said, that there was in Kétumti, in Indra's heaven a Devata named Maha Séna, who might be able to compete with Milinda. Upon this the assembly adjourned to Indra's heaven. Indra inquired if the king had not been before in his heaven—and on being assured that he had been there, Indra intimated to Maha Séna that he should descend to the earth from the Loké heaven. The Superior of the Arrahans persuaded this holy person or Deva to undertake the visit out of regard to the religion of Buddha. The Superior inquired on his return if all the Arrahans had accompanied him—when Rohana replied that he had staid behind, being absorbed in contemplations. For this breach of duty he was, as a punishment, sent to a brahman's village on the *further side of Himala*, there to afford ghostly instruction to Nagaséna, the son of the brahman Sonúttara, for 7 years. Thus after portents on earth and in the heavens, Nagaséna was born.

It happened that this brahman had appointed another brahman to be the preceptor of his son, and had required that the youth should be grounded in the three Veds and the Silpa. The youth Nagaséna had heard read but a small portion of these sacred volumes, when he became impressed with a perfect recollection of their whole contents. These Veds consist of Niganda (pa), Sarakkha, Ittihasa (pa), Viyakurna (pa), Lokayatana (pa), Maha Súpinna Lakhana. The boy inquired of his parents if there were any other Veds, but was told that there were no more. He accordingly dismissed his teacher, and having read the four; (Q. 3?) Vedas, he thought them of little value, and that all true wisdom and knowledge had disappeared from the earth.

While absorbed in these reflections Rohana arrived at his father's house. The youth asked him why he wore patched garments? I am, said Rohana, Babbajit or Athit, or he who has got rid of sin and the passions. What then do you know of the Silpas and Shastras? I know the chief Silpa. Why do you shave the head? There are 16 acts relative to the head, which must not be attended to, and which can only be avoided by the tonsure. Head-dress, cleansing the hair, curling it, operations on it with iron instruments, anointing it, nikkhi, also adorning it with flowers, scenting it; twisting and tying it (nimasa).

Huritakki, purifying it with this fruit.

Amulaki, and so with this fruit.

Muttika palibod, ditto ditto with this earth.

Pinning of the hair.

Gundaka palibod, purifying it from any unpleasant smell.

Khaché, the same.

Kapaka palibod.

Nahapuka—washing it with water.

Moreover, parasitical insects are disturbed and killed by these operations which are thus sinful.

“But,” said the youth again, “Why do you wear patched garments?”  
 “Because,” replied Rohana, “by wearing unpatched clothes a person continues attached to the world.”

Rohana then takes Nagasena to his abode at the Vihara of Wijampa, where they remained one night; then they proceeded to Rakhitalena, where were assembled the Koti satanan Arahantanan purato patu rahosi of Arahans. This place was in Himala. Here Nagasena was ordained as a priest—and Rohana, at his request, began to instruct him in the doctrine (of Buddha) beginning with Kusalá Dhamma—Akusala Dhamma—Abbiya Katha Dhammá. When Nagaséna had learned these three preliminary, he immediately recollected seven other Maha Pakarani, namely, the

Abhi Dhamma Sangini.

Wibhauja.

Dhatu Katha.

Puggulla Panyati.

Katha Wúttú.

Yamaka.

Pathama.

The Arrahans had resided for 20 years at this abode, and Nagasena had attained to the age of 20 years. He was then made the chief priest or Uppasampada.

Nagasena became dissatisfied with his spiritual guide, because he could not impart more knowledge to him than he had already acquired. Rohana knew what was passing in his pupil's mind, and reproved him for it, saying that he would not forgive him for his want of confidence, unless he would go to Sagal and humble the (spiritual) pride of Raja

Milinda. Nagasena replied, "Not only will I humble him, but all the princes of the world, should they confront me."

As it was the *rainy season*, Nagasena went to visit Assagutta, a Muni, and said to him, "I have been sent by my Gúrú with his respects : you know his name and he knows your's." But although the young priest staid three months with the Muni, the latter did not converse with him (on religious matters), but advised him to go to Asokorama or Wihar, or monastery at Pataliputra, where, he added, resided the priest Dhammarakit—where religious instruction would be given to him. This place he said was distant one hundred yojana.

Before Nagasena set out an old woman who was *cook* to Agrabutta [was this not a forbidden luxury to devotees ?] on listening to Negasena's recital of the *Purm Dhurm*, became inspired, or a *Soda patimagha*.

He consequently joined a caravan of 500 carts which were under a merchant, Pataliputta Koséthi, who received religious instruction from Nagasena and became *Soda Patimar*.

When Negasena had reached Asokarama, he found there a learned Bhiku named Tissadatta, who had come from Lanka. These two paid a visit to Dhammarakit, and they were taught together by him the Pali *Digha Nikaya*. In three months they were perfect. Nagasena now became an *Arahan*, when the earth quaked, &c. After this, at the desire of the multitudes of *Arahans* of Himala, he returned to them. Here he received instructions to proceed to Sagal and humble the pride of Milinda Raja. He was on this occasion escorted by 80,000 *Arahans*.

Milinda Raja, about this time, asked his ministers if they knew any learned priest. They replied, that they knew one named Ayúpala, who lived at the Sangkéya Pariwena. His majesty paid this priest a visit, accompanied by 500 persons. In the course of the conversation which ensued, the Raja tried to elicit the qualifications of his guest, but the latter kept silence and retired out of respect, to his cell. The Raja laughed, and asked if Jumbo Dwip held no other so learned as himself?

In the 2nd volume the king learns the name of Nagasena, and is greatly disturbed on first hearing it. He accordingly visits the priest, and a long dialogue ensues, which would occupy here too much space were I to insert it.

In illustration of these remarks I shall quote the *Ratana Kalapa*, under the head *Ubhato Kotito Panha*. Here it is inculcated that as



Buddha is in Nivana, it is 'useless to worship him, and only requisite to venerate his memory, and follow his precepts. Statues too are only useful for refreshing the memory, for as the husbandman sows grain in the earth and reaps the harvest, so he who believes in Buddha and follows his doctrines will be saved. The earth and Buddha are both per se inert.'

Buddha too led a wandering life, followed by his disciples. As Christ quoted the prophets, so did Buddha, and his disciples the four Buddhas who preceded him. Buddha visited the infernal abodes, like Christ, and he was treacherously poisoned at a supper, and although by his prescience aware of his doom, yet he strove not to avert it, so did Christ, and he ascended like Christ to heaven, and will at the end of the five thousand years be succeeded by the fifth or last Buddha, so Christ is to come again in the last day.

The metempsychosis is a radical portion of belief both in brahmanism and Buddhism, and has a ready type in Egypt. A misinterpretation of the nature of Christ, of his, to be (alternate) changes from the divine and spiritual essence to physical existence, might under circumstances of priority of time, have led perhaps to the dogma *just* adverted to.

"No supreme superhuman Buddha," observes Dr. Roer, "or Buddhas, or Adhibuddhas, are found in these Nepál books."

I have already expressed my belief that the apotheosis of the Buddhas was borrowed from what was apparently at first a distinct form of worship, that of heroes and great benefactors to the human race.

From what can be gathered from Buddha's own oral discourses or sermons, their sole aim was to direct his hearers in the road to Nivana, a condition of eternal rest, undisturbed by migrations, or moved by any thing external or internal.

If future angelic or god-like super-power had been one of his objects or his chief one, then the tiers of the Buddhist heavens might have been filled with thousands of such spiritualities, all eternally exercising the power of gods, and influencing, according to the creed of the degenerated Buddhas of later days, the destinies of man, and thus rivalling the Hindus in the multitudes of their gods.

Buddha himself, agreeably to the Pali Thatsa-chatta, in my possession, passed through ten states of existence, ending with that of Sakya Muni. Thenceforward, he became dead to the universe either of mind

or matter. His followers might gratefully endeavour to perpetuate his name and his sympathy with their moral deficiencies, by connecting these with splendid Chaityas and temples and colossal statues, but his ministry had been accomplished, and he could in no way influence their destinies, or happiness, but by the example and precepts he left behind him. His object,—that which he had pointed out to his followers as the sole aim of all his actions, had been, as he and they believed, attained, when he was on the point of entering Nivana, which, like the negative Elisian beatitude of the Vedanta school, consisted originally perhaps of a total absorption into the divine essence, thus losing all identity.

The study of the simple Sutras, according to M. Burnouf, will throw much light on the connexion of Brahmanism and Buddhism.

I shall not hazard an opinion as to the nature and scope of the Indian epigraphic monuments lately elucidated and ascribed to Buddhists. When this very interesting branch of antiquarianism shall have been so proved and analysed as it ought to be, it will be perhaps time enough for a final decision. If these shall ever be awarded to the brahmans, they will probably exhibit the latter under very different phases of religious and moral character, than we have been accustomed to view them in.

It would meanwhile be satisfactory to learn if there be in existence an undoubted specimen of the Sanscrit character of a date anterior to the oldest existing Pali character. The brahmans may not have cared much about epigraphs, but if they were a race to whom India was destined to owe its religion and social polity, some vestiges of the written character in which these doctrines were to be preserved would, one might suppose, have been left on some less perishable material than leaves or paper.

It has not been proved how castes originated, or when. If caste existed over Gangetic India and the Peninsula at the time when the brahmans were confined to the Punjab, it must, I think, be admitted to have done so independent of the latter. As I have before hinted, the brahmans probably found the nucleus of the institution as derived, according to Sir W. Jones, from Persia, extant in India, on their first intermeddling with its civil affairs; and readily availed themselves of so convenient a weapon for dividing and ruling.

The Peninsula of India must however have been far removed from even the first feelers which they pushed out before them, and assuredly if Buddhism did not descend to Hindustan from the N. W., but was indigenous there, its first types, emblems and monuments ought to be also there found. I believe there is no one who does not allow that *Brahmanism* (not Hinduism) if it ever reached at those early times the Peninsula, pervaded in the first instance the regions of central India, and perhaps those bordering on Guzerat, and that Hinduism appeared on the Peninsula at a much later period than Buddhism. Why the brahmans did not at first proceed there also has not been shewn by any ancient records, and this might lead to the inference that they had really then no regular priesthood, and were therefore careless about making proselytes.

It seems to me, that until proof to the contrary shall be advanced, it will be safest to consider all the most ancient Buddhist Chaityas as having been clustered towards the countries in, or bordering on the Punjab, and if Buddhism did not at the periods of their erection prevail in southern India, that some religion other than Buddhism or Brahmanism, must be sought for in it; allowing for the probability at the same time, that hero-worship may at some remote period have existed in southern India independently altogether of both. Should even Buddhism be found to have arisen amongst the brahmans, there is nothing to prevent us supposing that man-worship was brought along with them from Persia or some other western region.

The Nepál texts were compiled or written when Hinduism had made several rapid strides, and the sanctuary of Buddhism had been invaded by both open and concealed heretical enemies, and we therefore do not, and perhaps cannot, know to what extent reliance is to be placed on these Nepál books—especially as in them “the whole brahmanic society, with its religion, castes, and laws appears.” (p. 796.) We know that the heretical Buddhists to the eastward tolerated, if they did not venerate, the Hindu gods and the converse as to the Hindus there in respect to Buddha.

If the Hindu Pantheon, with its complement of male and female deities and inferior Devatas, had actually been erected at the period of Buddha’s advent, where are the remains of its Pagodas? where are its epigraphic and other records on stone, brass or other metal? It was natural that

the Buddhists, had such existed, should have passed them over in silence; but very strange and inigmatical that the brahmans,—whose sacerdotal rivalled their political ambition, should have hidden their towering heads under a humble mud cabin.

The transition period, if such there was, had not apparently passed when Buddha appeared, for he did not discard the brahmans.

Admitting even that the Brahminical society had reached its acmé in Sakya Muni's time, are we to consider that society as embracing more than a merely fractional portion of the Indian population—or as extending beyond the tribe of brahmans? Baron C. Hugel says, "that there is no doubt of one fact, that when Alexander was in the country of Taxila, the people neither belonged to the Brahminical or Buddhist faith—as they ate at his table, and *did not burn their dead*, but (like the Parsees) gave them to be devoured by vultures. Hence," he adds, "the people were of the same religion as the Parsees, and it would be worth something could the latter be identified with the brahmans." I do not quite apprehend who are here meant by the people. The brahmans had certainly some connexion with Persia—and so had the original Indians I suspect, as has been already alluded to.\* But Sir W. Jones has commented fully on this subject, as I have already quoted.

There was no prohibition I think, in original Buddhism, of its votaries eating with any other class, and the present Buddhists to the eastward do not object to sit down to table with Europeans.

And were all their gods and goddesses and suite of minor divinities indeed worshipped by the people in the midst of which Sakya lived with his ascetics? constantly and exclusively worshipped by all castes? If so, Buddhism must have had no existence at all when Buddha appeared. We require to have such gods or deities as did exist in the minds of the people, selected from the Buddhist works, which after rigid inquiry, shall be found of the greatest antiquity. All I have seen regarding the gods in the Buddhist Bali works of Siam seem to have reference chiefly—if not only, to Brahma, Indra and Devatas; although the gods of the Hindus have been *subsequently* mixed up with their system.

It is quoted from M. Burnouf that "the Kshatrya caste also existed at the time of Sakya, from which the kings emanated." But Indian history, such as it is, exhibits many kings who were not of this caste, and who were served by brahmans.

\* Baron C. Hugel's travels in Cashmír and the Punjab, page 24.



If the brahman caste had been all-powerful, all the rulers and dignitaries of the land would have belonged to it.

If the Brahmanical tribe was *itself* divided into castes, then there were two bodies under this denomination,—the Brahmanical and the Indian, which, if proved, would at once shew that caste came with them, from Persia or some other contiguous region,—and if any one could be a brahmana, an anchorite or an ascetic, and a teacher of the Brahmanical mantras, there could scarcely have been any regular Hierarchy. It is not likely that we shall ever learn when the brahmans ceased to be what Fa Hain termed them, a small tribe of foreigners,—for their march to power was insidious. Sir W. Jones informs us that the Mohsan states in his writings, that in the opinion of the best informed Persians, who professed the faith of Hushang, distinguished from that of Zeratustht, the first monarch of Iran, and of the whole earth was, *Mahabad*, (Maha?—a word apparently Sanscrit,) who divided the people into four orders,—the religious, military, commercial and servile, to whom he assigned names unquestionably the same in their origin with those now assigned to the four primary classes of the Hindus.\*

If we were to admit that Sakya Muni had three predecessors, and to allow only a hundred years to have elapsed betwixt each, we might fix B. C. 843, as about the time when Buddhism was first promulgated, and in such case, where ought we to place the brahmans at that period?—not to the south and S. W. of the Punjáb? If dissent had not also sapped the foundations of Buddhism, the brahmans could never perhaps have risen to power, and that dissent became the more dangerous inasmuch as to *Buddhism*, it embraced men who were brahmans well versed in the Vedas, and who being fully informed of all the weak points of Buddhism,—for no popular feeling was wounded, and no political institution, caste included, was assailed by Buddhism; on the contrary, it was, while it endured, a very popular faith, and we have its present prevalence over Hindu-China, Japan and partly China itself, as a proof of the tenacity it now possesses over the human mind, and which it probably originally did possess, until force subdued it. The Indians rivetted the chains already forged for them by the brahmans, when they abandoned the freedom and equality of Buddhism, and placed the mighty engine of civil and religious thralldom, that of the castes, entirely in the hands of the *Hindu* priests, or brahmans.

If the brahmans, when Buddhism was advancing, had possessed but a fraction of that power the Hindu priesthood now has, there would have been no Buddhism within the area of its influence. They must then have feared the people, and the latter must have had no serious, if any, obstacle opposed to a change of religion. In fact, the whole of Indian society, brahmans included, seems for a long period to have been fermenting with opposing philosophical, religious and metaphysical theories, which prevented the public mind from settling down to one belief, and it was a mighty point gained by Buddha or the Buddhas, when he, or they, drew off the minds of the multitude from vain antological speculations and ethnical absurdities and grossnesses, and directed it to the plain, although perhaps not equally attractive path of ethology.

It is observed (p. 807,) that Sakya attached little importance to religious forms or to the offering of flowers and perfumes. If it be meant by this that flowers and perfumes *were Buddhist offerings in the last Buddha's time*, to whom were they offered? They must have been so *to a prior Buddha*. If such offerings had no existence until after Sakya's death, this Buddhism could only be properly said to have commenced from that last period when these honors were paid at his shrine. But I agree with Dr. Roer in believing that there must have been statues of the three\* Buddhas previous to Sakya's time; and this, whether such persons ever existed or not—I have already stated my opinion that they did exist within reasonable periods gauged by the moral necessities of the Indian population, or any other one amongst whom they lived, although the objection might be started that they were merely the exponents of Astronomical or Cosmographical periods.

That which has in the west been called Buddhism, or a derivative from it, such as Druidism and the religion of Odin or Wodin, and perhaps other religions, have been assigned almost invariably to some region of upper central Asia; Indo-Scythia generally. The Buddhism of India therefore must, if connected with any more western one, have been much more ancient than Sakya's system, or in other words, the parent of it. The Goths brought with them from Indo-Scythia to the west the mythology of those religions bordering on Persia and Hindustan.†

\* I suppose 4 is a misprint.

† Faber's Cabiri, Vol. I. p. 290.

The Egyptians had not only two kinds of written character,—one popular—the other Sacerdotal, but two sorts of *sacred sculpture*—one simple, like the figures of Buddha and the three Ramas, the other allegorical, like the figures of Ganesa, Isani, &c.\* Here we have the externals at least of Buddhism and Brahmanism when contemporaneous.

Druidism was, according to Davies, simply the worship of men—deified after death. Like Brahmanism, it took a long time before it became sanguinary—and only became so after the Phenecians, as Faber informs us, led Colonies to Britain. Druidic man or hero-worship was corrupted, says Davies, into the worship of the sun, moon, and stars. Hence issued the deities of Chaldea, first, then Egypt and *thence* to the east or India, or Tibet, Britain, Tartary, Asia and Siam, Ceylon, Japanese Isles, China, Siberia, Russia, Scandinavia and the N. of Europe. Thirdly, to India, Scythia and China. Fourthly, to Rome, Europe, Germany, Gaul and Britain. Fifthly, to Greece. The Druidical religion is a ramification of Hinduism. Should he not have said of Buddhism? The first part of the above paragraph closely accords with some parts of the ancient Persian system of religion. Francklin assigns Tartary as the birthplace of the Druids, basing his supposition upon physiognomy, or rather on their facial and craniological conformation, and that Buddhism reached the Persians and (from the neighbourhood of Afghanistan perhaps) before A. D. 700.

The pyramids of Egypt have been shewn by explorers to have been erected as mausoleums for the mighty dead. The Tower of Belus might have been built for a similar purpose. The Israelites in their wanderings betrayed a tendency, to imitate that pyramidal type.† One author has informed us that the *Meru* of the Buddhists is the tomb of the Spirit of heaven, his bones having been scattered all over the world and being afterwards collected like (those of Osiris), were enshrined.‡

The Cuthite Ethiopians expelled the Mizraim from Egypt [or aborigines] and they raised the pyramids. This nation became afterwards Scythæ or Scythians, and were esteemed the oldest nation on the earth.§

\* As. Res. Vol. II. p. 273.

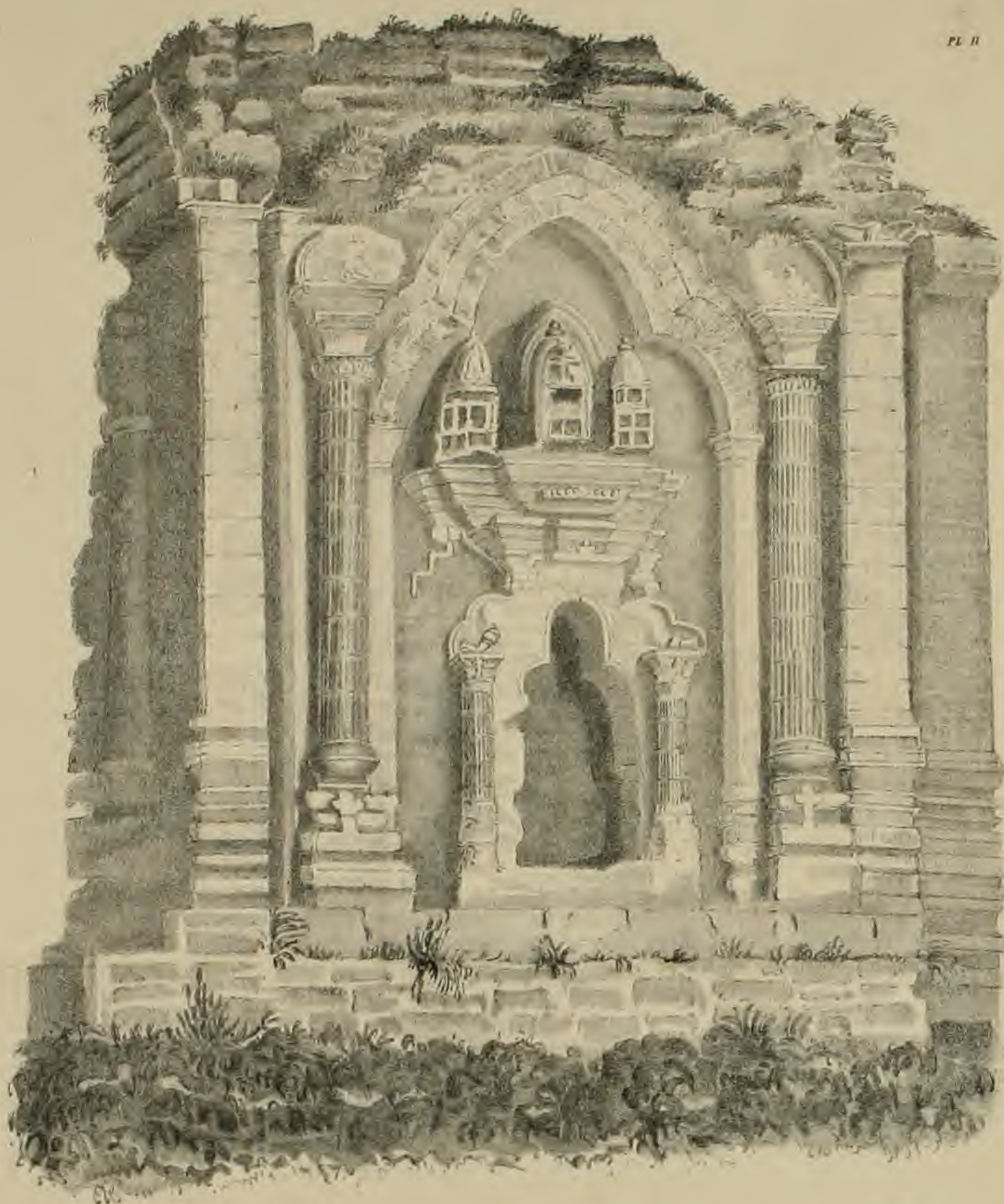
† Prichard's Egyptian Mythology, pp. 29, 30.

‡ Tr. A. S. of B. Vol. X. p. 128, et seq.

§ Franklin's quotation (p. 154) of Bryant's Analysis.







REMAINS OF AN ANCIENT TEMPLE AT MULLOTE, PUNJAB.

*T. H. M. J. 1851.*



Fig. 1.

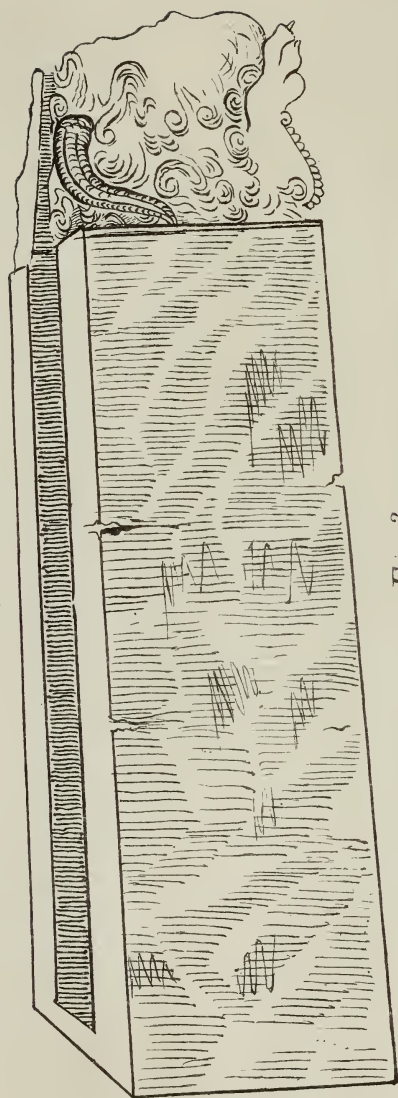


Fig. 2.

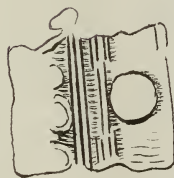


Fig. 3.





The Ethiopians have colossal statues of *priests* eighteen feet high.\* The Egyptian qualities of the sun and moon were five: spirit, heat, dryness, moisture, water and air, which were converted into *five* gods, and the five Buddhas.

I must claim the indulgence of the learned for having hazarded so many crude reflections, especially as (before noticed) I quite disclaim any pretensions to Pali or Sanscrit scholarship. Dr. Roer's attainments in oriental literature entitle his remarks to close attention, and although suspending my own judgment as to the main object of controversy, I have not been the less gratified by their perusal.

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*Remains of Greek Sculpture in Potowar, by Capt. JAMES ABBOTT,  
Boundary Commissioner, &c.*

I had been detained some days upon the table-land above Pind Dadem Khann, had visited the salt mines at the base, and the antimony matrix at the summit of Mt. Kurrungli, and had witnessed the annual Hindu purification in the celebrated Fountain of Kuttass, one of the eyes of the earth. I had fixed my departure for the morrow, when I heard of an old site in the neighbourhood and visited it, expecting little recompense, owing to former frequent disappointment. It is the summit of a knoll of white limestone on the left bank of the rivulet which escapes from the fountain of Kuttass. The glen is the wildest of that neighbourhood, having probably been selected on that account for the site of a temple to Ammon. Abrupt limestone ridges wall it in on two sides.

The Muhammedan faqueer whose ancestors have occupied this site about 300 years, strenuously denied that it contained any sculpture; and although the basement, of which some stones are still in place, gave promise, by its simple finish, of the Grecian chisel, it was long before my search was rewarded by any indubitable testimony. By degrees, however, fragments of cornice, frieze and pilaster, were turned up, and then a sculptured spout (Fig. 1 of the Plate III.) accompanying. I offered a reward for the fragments of the mouth, but all search proved fruitless. A singular mass of sculpture next came to light (Fig. 4 of

\* Singly.



the Plate IV,) a trefoil arch shrining a seated figure, so like many of the Indian idols that I despaired of establishing in other minds my own conviction that this temple was the work of Grecian hands. Another weather-worn basso relievo, which in its present state might easily pass for a Satyr or a Hunoomann, confirmed this fear : but it was dispelled forever when on turning an unpromising block of stone, I found the reverse to be a head of Bacchus or of Alexander in his character of Ammon, (Fig. 1 of the Plate IV.) I cannot express the relief which this afforded me : not as regards my own gradually but firmly established conviction, but on account of the triumphant evidence upon which I give it utterance.

When Tod's *Rajasthan* first issued from the press, I was struck with the resemblance in plan and outline, between the Grecian and Rajpootra temples, and this impression was confirmed as I became more intimate with the architecture of Western India. Still there appeared no possible link of connection between Rajasthan and Greece ; the intervening tract of India and Afghanistan exhibiting no proof that the successors of Alexander had introduced their architecture into lands south of the Indian Caucasus ; and the surmises of Tod, appearing to me rather such theories as an enthusiast would desire to establish, than sober structures based upon fact. The architecture of the Bullur and Manikiyala Topes first startled me. The pilasters are manifestly Greek, and belong to an order either borrowed from Greece, or borrowed by Greece from India. The sculptured freestone at Jelum, the ancient Bukephalia (see plate in your late appendix) I at once recognised as Greek. A gentleman known to your pages for his botanical contributions questioned the fact of the heads of corn therein represented being maize, upon the generally received idea, that maize was first introduced into India by the Portuguese. But it is so manifestly nothing but maize, which is there represented, that if the Portuguese were the introducers of that variety of corn, this sculpture could not be Grecian : and as the style is evidently that of Greece, the sculpture acquires considerable interest from the question depending upon it.

About a month ago I visited a town called Kala, 4 miles N. W. of Jelum, and found therein a beautifully sculptured column almost precisely similar to some in Rajasthan (see Plate V). This was dug from the site of Bukephalia by a brahman and transported to a new temple





at Kala, under the belief that the figure in the niche is a representation of the goddess Kali. I perceived at once that it was Grecian ; although the interblending of styles would, I foresaw, make it difficult for me to convince others of the fact. The pillars you will perceive, are, as in those of the Tchoah temple, of what may be styled Indian Ionic : the simple volute being exchanged for an acanthus leaf. The figure bears in its left hand what seems to be a cornucopiæ. It is rather clumsy, and savours of the land of Egypt ; but the hands are wrought with perfect truth and the transparency of the drapery is admirable and utterly inimitable by eastern art. The head dress can only be surmised by what remains of it ; the face and head having been mutilated by Muhammedan bigotry. It would seem to have been a turban, and we learn that in Alexander's day, Persian women wore turbans. The bosom is defaced and the sex of the figure is doubtful. There are points of resemblance between this sculpture and the figure of Osiris at Aknoor, (see your late appendix), viz. The bend of the body, its clumsiness and the beading in the huge head-dress. It seems highly probable that the bulk of the imported sculptors were Egyptian, superintended by Grecian architects. The greater proximity of Egypt and her skill at that time in sculpture, as well as the dependence at the outset of the colonies upon Egypt, and their utter separation from Greece by the intervention of Egypt, when that dependence had ceased, rendering this highly probable. Allowing this, we shall not be surprised at the abundant use of the lotos, applicable to temples of Jupiter Ammon, of Osiris and of Bacchus. The lotos ordinarily employed is that bastard kind so common in Bengal, and not allowed to be the Puddum or Kuwwul, or sacred lotos. In the Tchoah temple, however, we have the true lotas unmistakeably and most faithfully sculptured, (see Fig. 3, Pl. III.)

The head (Fig. 2, Pl. IV.) has been severed from its trunk, and as the figures of Bacchus were often effeminate, the sex cannot be determined. The cap resembles that of a Toorcuman\* bride, and is manifestly Tartar. It may have represented Juno as Ammonia, or Isis, as the companion of Osiris Ammon. The three plates upon the cap are manifestly of lamb-skin and the sculpture may have been executed previous to the separation of Potowar from Bokhara.

\* There can be little doubt that the Amazons or Hummanzun were Torcumuns, and this figure may represent one of them as amongst the attendants of their conqueror Alexander.



The head upon the waterspout seems to me to have been human, and had it not been so, it might have escaped mutilation. The cheeks are full and smooth, and although upon this sketch the peculiar perspective of the fracture gives the idea of a ram's head, there is no such resemblance in the original. My people pronounced it a lion, which the paws and the fulness of the cheeks justified. But I think any European would recognise it as human ; the head of a Jupiter Ammon.

The horned, human head, (Fig. 1, Pl. IV.) is manifestly Osiris as Ammon. The face is almost as smooth as that of the female head, but not so decidedly feminine. The rings in the horns are not delineated,—every thing nervous is excluded. The very horns are effeminate, and a chaplet of roses forms the setting. We must bear in mind, that it formed a mere ornament to the entrance of the temple similar to those in Plate II. The query is whether a temple to Osiris Ammon would be externally decorated with figures of the presiding Divinity, or whether that Divinity was not rather the old and sterner Jupiter Ammon of the desert? In this case the female head may have belonged to a companion of the Deity, or to a subordinate. The summit of the female's cap is pierced, rendering it probable that it was a caryatid.

Amongst the true lotos flowers (Fig. 3, Pl. IV.) will be observed a fir apple, one of the Bacchic emblems ; but I have vainly endeavored to discover anything that can be pronounced either vine leaf or ivy.

Considering the foundation of this Indo-Greek kingdom by Alexander : the love and enthusiasm of his followers, his untimely death and his politic assumption of Divine rites as the son of Ammon ; it is not improbable that temples to Alexander Ammon may have been erected upon the theatre of his exploits, and if so, this is certainly one of them. Such temples would want the emblem distinctive of Bacchus, viz. the vine ; and ivy might be excluded for the same reason. But this would exhibit the emblems of the lands of his conquest, the lotos for Egypt and India, the caryatides of Tartary : and the figure of Osiris Ammon might be introduced as subordinate to the conqueror.

I write at great disadvantage so many hundreds of miles from any books of reference, and with a memory almost unrefreshed by study during five and twenty years. It is possible, therefore, that further research may modify some of the theories. But, that the thread of connection between the architecture of Rajpootana, and that of Greece,

is established, admits not of a doubt. And I cannot but regard the fact as of intense interest to the antiquary, tending to affect many of the prevailing theories of the origin of the most interesting race in India.

By pressing my enquiries on all hands, I learned that the architrave, and lintels of a door to this temple had been removed to Kuttass, and introduced into the principal temple there. I revisited that temple at the latest hour of my stay, and found the stones alluded to sculptured into the most graceful and exquisite wreath of flowers, terminating below in a cornucopiæ. The flower which I know not by name, though it is familiar to my eye, I have seen, unless memory deceive me, beautifully delineated in the inlaid work of the Taz. The workmanship of the Taz has surprised many. Whence the models and who the artists? Some of the models I have found growing wild upon the mountains of Afghanistan; here is another. Doubtless, when the Taz was erected, vestiges of the exquisite taste of Greece were less obliterated. Two centuries of Muhammedan bigotry, yea the single reign of Aurungzebe, being as deadly in its effect upon the graces of social life, as forty centuries of the wear and tear of the great destroyer.

Whilst busily searching the Tchoah site for fragments of sculpture, the faquer observed, "If you look for images you should go to Rám-kata, where they lie thick as shingle; many of them still in their niches." Gathering from his description that a Grecian temple was still existant at that place, I deferred (though much prest for time) my march, and started at once for Rámkata,\* distant about 15 miles westward of Tchoah.

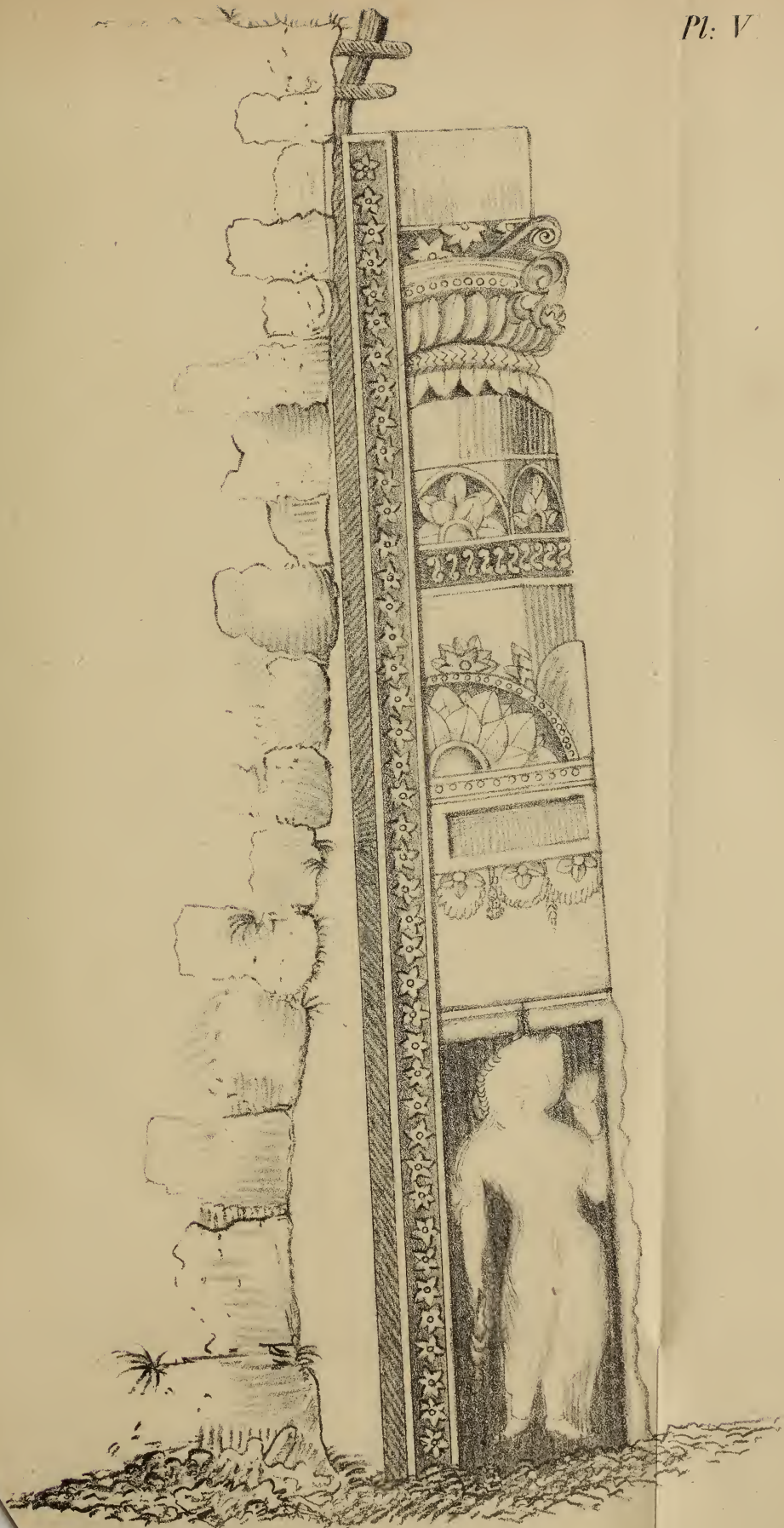
At the southern brink of the table-land of Potowar a small area half a mile in length by a quarter of a mile in breadth is scarped southward by precipices 200 feet in height, and northward by a precipitous acclivity of some fifty feet, resembling upon a very diminished scale the site of Maundoo in Malwa. The rocks are white limestone full of sea-shells and masses of flint and agate. Graceful towers have been constructed on the northern face connected by walls of loose stones: and thus we have a fortress of some strength were it preserved in repair. In the interior, near the southern declivity, at the highest point, stands a ruin which at first sight appeared to me that of a Gothic Church—on approaching, my ideas were strangely confused: for here are fluted

\* Called also Mullote and Shahgurh.

pilasters of Grecian order, surmounted with Persian capitals; and between them is a trefoil arch containing the obelisk of Shiva and surmounted by a Gothic gable. And the architraves are supported upon Grecian pilasters, and on either side of the recess of the false door are curvilinear entablatures filled with figures in Roman or Grecian armour, and upon the frieze are rows of alternate sphinx and warrior, and every cornice is Grecian, though often barbarously perverted, and as we gaze upon the fabric, we call to mind those wretched gingerbread temples in Bengal, in which Grecian pillars and cornices have been mixed up with Saracenic domes and minarets and obelisks peculiar to India. The work is in red freestone, but so obliterated by the elements and so defaced by Muhammadan hands, that much is left to conjecture: every head of every figure having been lopped away. In many places the sandstone is dissolved into a mass of red, ochrous sand. My first idea was, that I gazed upon a Buddhist temple built from the fragments of a Grecian fane. But more attentive consideration dispelled this impression. The details (the obelisks excepted) being all Grecian, though sadly lapsed into barbarity. The entablatures of the façade strangely resemble those ugly rigmaroles which disfigure Italian Churches.

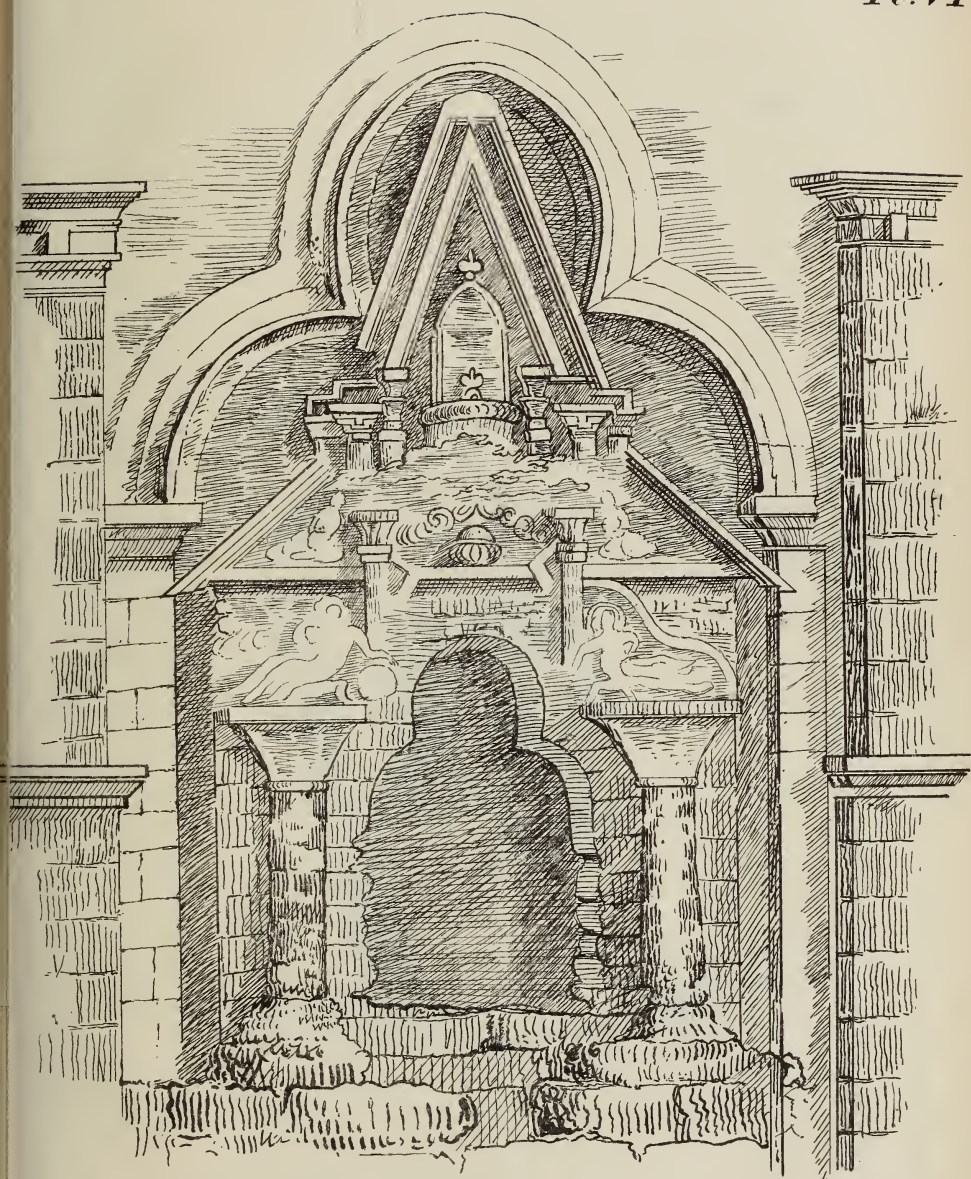
The building consists of a Propylon eastward and the Sekon just described, of which the only door faces the east. The façade on this side resembles that in the sketch, with a slight difference. The cell is a lofty, nearly square apartment of sandstone, cemented with lime, but not plastered. The roof is vaulted, but open at summit, having either been so constructed or since broken through to admit a passage, for above it is a modern cell built by a Muhammedan devotee. The sandstone within is in perfect preservation. The interior of the cell is wholly undecorated; but the inner walls north and south of the Propylon are decorated with singular piles of sculpture resembling the exterior facade of the Sekon. They seem to me to offer a key to so much of the style as is not Grecian—the abrupt slope of the upper gable and the mitigated slope of the eaves, presenting a correct outline of a Chinese or Tibetan temple, such as in the mountains we see constructed of timber. The whole seems to me the work of this Grecian colony after its subduction by Scythia,—their own taste being constrained by edict to conform to the general outline of their conqueror's temples.













*PL. VII.*







I could make but a very hurried sketch, for my leisure was restricted to a few hours, and the wind, the sun and a drizzling shower greatly interfered with the operation. This however may suffice to point the way to further discovery of relics in which Potowar\* is evidently rich.

The sculptured stones I had conveyed through the kindness of the Dewan Adjoodia Persaud to Lahore, but as the scientific officer who received them, gave me a receipt only for "a bundle of stones," I have some anxiety about them. I believe I can get them conveyed free of expence to the Society to Delhi or even to Calcutta. They are not very bulky.

In plate VII. is a sketch of a very remarkable marble sculpture turned up at Noshera in Huzara, some years ago, and adopted as a household god by a Kuttri of Kurripoor. I could not persuade him to sell it. It is the Diana Triophthalme, and will exhibit the origin of the attribute of three-eyed to shew for whom it has evidently been mistaken. The third or central eye is delineated in a vertical position precisely as in the pictures of Shiva. The execution is coarse. The block of marble is unfinished and has probably been imbedded in a wall. The natives mistake it for a male figure, perhaps because Chandra (the moon) is male.

My papers are just now in considerable jeopardy, or I should feel disposed to defer this communication until I could make it more complete : but I am warned by subsequent losses.



*Notice of a Chinese Geographical work ; by J. W. LAIDLAY, Esq.  
V. P., &c.*

Although, as I find after preparing the subjoined extracts for publication, the interesting little work from which they are derived has already been incidentally noticed by M. Klaproth in an article upon Chinese Cosmography in the *Journal Asiatique* for 1832 ; yet the great interest attached of late years to such productions, may perhaps justify the insertion of this additional specimen, even at the risk of a little repetition.

\* I apply the name Potowar to all the table-land between the Indus and Jelum, bounded on the south by the salt range, but I am not certain that this designation is correct. At present the name applies only to the north-eastern portion.

The author of the treatise in question was named *Chhín loen kwing*. In a short and modest preface, he states that his father being in too poor circumstances to devote his attention to letters, was compelled in early life to push his fortunes on the sea; that there he became distinguished for his knowledge and skill, and had the good fortune to render important service to the expedition sent by the emperor Khang hi for the reduction of Formosa. He was thus brought to the favourable notice of that emperor, and was promoted from post to post, till he attained the appointment of lieutenant-commandant of the coasts of Kwáng tung. He was naturally proud of his profession, and “very impressively” instructed his son while yet a boy in all the mysteries of his craft, “the islands and the shoals, the harbours and the dangerous places, the haunts of pirates,” and other matters of seafaring interest, so that, as the latter assures us, he never in after life forgot them.

Our author obtained in his youth an appointment in the body guard of the emperor Khang hi, and enjoyed an excellent opportunity of extending his geographical knowledge under the auspices of that monarch, whom he describes as graciously taking a personal interest in and promoting his studies. He afterwards held various appointments of importance, visiting officially several of the countries described in the course of his little work, and improving his knowledge of more distant lands by intercourse with Europeans and other foreigners whom he occasionally fell in with. The preface is dated in the 8th year of *Yung ching*, corresponding with A. D. 1731.

The work itself is entitled *Hái kwo wán klan lu*,\* or a Narrative of what is seen and heard of the seas and the nations. It is divided into eight chapters, the first of which treats of the sea coasts of China, and is accompanied by a set of maps exhibiting the entire sea front from Kao li (Korea) to the boundary of Cochin China. This chapter is occupied with a rather dry and uninteresting detail of the distances and bearings of different places, and the dangers encountered, as well from the ordinary perils of navigation, as well as from the pirates by whom many parts of the coast were at that time infested. As the author avoids, apparently intentionally, any particulars regarding the country or the people, there is nothing in this chapter of sufficient interest to extract; so that we may pass at once to the second, entitled

\* 海國聞見錄

“TUNG YANG KI;\* or *An account of the Eastern Ocean*. What [wondrous]† things doth not the vast extent of the universe contain! The spirits of space,—the 10,000 varieties of living beings,—the sun, moon, and constellations,—and many other things which transcend our comprehension! All these the Holy Sages have examined and discoursed upon; and they, too, to determine the four parts, invented the compass,‡ dividing it into twenty-four rhumbs [extending] from near to far, and admirably adapted to enable us ignorant men of after ages to inform ourselves of all the kingdoms of the world: kingdoms extending beyond kingdoms!

Let us describe then the foreign kingdoms of the earth; the navigation to them; their people, productions, customs, and what really is to be seen and heard among them; that henceforward honorable men may be enabled to pick and choose.

*Chiu sín§* is situated in the north-east quarter of the world. It adjoins *Shing king*, and lies opposite to *Thin chæn||* and the country of *Ku ki tsí*. It is divided into provinces and districts, and is the high road through which the tribute passes to the court. Its history and geography have been compiled generations ago, and there is no need of speaking more fully of it here. On the south it is bounded by the ocean, on which is an island belonging to *Yi pan*,\* named *Ma tao*,† which may be reached in one night with a fair wind. At *Ming kwan pih* there were disturbances [in former times]. From *Ma tao*, souther-

## \* 東洋記

† The words betwixt brackets are interpolated to explain the meaning of the text more fully.

‡ According to some Chinese authors the compass (called by them *Chí nan*, the south index) was invented in the fabulous ages of their history. Others refer it to the time of *Ching wáng* of the *Chow* dynasty,—1121—1114, B. C. It is very curious that Marco Polo makes no allusion to so important an instrument, which was unknown in Europe till some time after his travels.

§ A province at the extremity of the Corean promontory.

|| *Thin chæn* is a district betwixt Pekín and the sea. The river of *Pe kín* is also so called.

## \* 日本

*Yi pan*, the spring or origin of day, is perhaps the etymon of *Japan*.

† I take this to be the island lying between the Japan group and the continent, and called *Tsu sí ma* on our maps.



ly, on the magnetic rhumbs *yin, ká, mao*,\* is an archipelago of seventy-two islands, all belonging to *Yi pan*, the country of the *Wai nu*.† These maintain a traffic with the Central Kingdom.‡ There is one island named *Cháng kí*, which with difficulty produces sufficient pulse and grain for the sustenance of the inhabitants. There trade is carried on for the public benefit, accounts are kept, and at the end of each year, whatever profit accrues, is equally divided among the people of *Cháng kí*. The king of this nation resides in the north-east part of *Cháng kí*. About one month's journey by land is a country named *Mi ye ko*,§ which translated means "*the capital*." He [the king] receives his title from the court of *Han*.|| He dresses according to the fashion of the Central Kingdom. The people study the literature of the beautiful Central Kingdom, but read it with the accent of *Wai*.\*

The king possesses the authority, but military and political affairs are managed by the military chief. The king interferes not in these. He receives sufficient for his subsistence from the tribute and offerings of the country. The military chief† occasionally pays his court to him, and that is all.

Changes in the succession occasionally occur from strife [among the members of the royal family]; but strife never occurs between the king and the military chief. It is narrated in the annals of *Yi pan*, that from the earliest ages of the empire to the present, there has been a succession of kings. In former times a military chief usurped the throne; but the country ceased to produce the usual tribute; the five grains became scarce; and the productive energies‡ of nature became

\* These points of the Chinese compass extend from E. 30° N. to east. The bearings appear to be given from Peking.

† Japanese.

‡ China.

§ The *Meaco* of our maps.

|| Of China, from the dynasty of that name.

\* *Wai*, Japan.

† This is the *Cubo* of our geographers.

‡ 陰陽 *Yin yang*: which may also mean, the *male* and *female* powers of nature, in which sense the words are used by Chinese writers. On the subject of these powers, Dr. Harland, in an interesting article on Chinese Anatomy and Physiology published in the Transactions China Branch of the Royal Asiatic So-

unpropitious. The military chief then returned to the station of a subject, when the seasons became propitious as before. Ever since that time no military chief has presumed to aspire [to the throne].

All offices are hereditary. Conformably to the customs of *Han*,\* the officers named *Chi sí*, receive an allowance of a thousand stone [of rice]. This allowance is ample for their support, and few are induced to transgress the laws. Every year they elect one of their number to be a constable,† who becomes security for the village and receives fifty [pieces of] gold per annum as his pay. They have little to do, and have ample leisure. They apply themselves to Chinese literature, become good scholars, and behave with urbanity. They wear peacocks' feathers in their caps. They attend to the cleaning of the roads and ditches, and to the sweeping and watering of the streets. Their families cannot consume the whole of the food, and there remains a surplus even for the servants to throw away.

The rich make use of carpets of cotton; the poor, of mats. On the occasion of a census, every family displays more or fewer mats, according to the number of persons. The garments of the men and women have broad collars and wide sleeves. The dresses of the women are so long as to sweep the ground, and are ornamented with flowers traced and dyed upon them. They wear cloth turbans, girdles, and on their feet, short socks to walk in. The men wear sashes, in which they thrust a knife. They wear their hair on the head, and beards; combing the for-

ciety, remarks:—"It is difficult to conceive a clear idea of the exact mutual relation existing between these two powers, which are said to have produced all things, though they are generally looked upon as a kind of male and female energy, as appears to be implied by the wonderful productive powers ascribed to them. It is probable, however, that these terms, when applied to the animal economy, might often be considered in a similar light, and perhaps with as clear an idea, as the words positive and negative in electricity, which have become so generally used of late years to explain any otherwise inexplicable phenomenon. In both cases, the terms are used to express certain opposing forces, which only become known to us by their effects, when either of them is in excess, but of whose existence we are not cognizant so long as the equilibrium is maintained."

\* China, so called after the dynasty of that name which reigned from

† *Kái kun*; literally, 'street magistrate.' Morrison gives *constable* as the equivalent.

mer backwards, and knotting it behind the neck in a band an inch broad or more; when the hair gets too long, they cut it. The women do not use *chí*,\* or flour.† Nor do they wear fresh flowers [in their hair], nor flowered cloth and silk, nor head ornaments, nor ear-rings; —only tortoise-shell combs. The young damsels are [numerous] as the clouds; all day they bathe and perfume themselves. They curl their hair before and behind. Their finger nails are extremely clean; they dread all impurity. Nevertheless, the complexions of the men and women are not to be compared with those of the lovely Central Land, although beyond comparison superior to those of all other countries. Verily, the east produces gay and etherial spirits!

The people of that country have all double sur-names, only the *Chæ fu* have single ones. The *Choe fu* unite the young men and young women in marriage. Those who dwell on the spot, are called *Chæ ke chæn*; their burial place is at *Hong tsi shán*. The men of this nation become impotent after fifty years of age. *Nu* is the name of the tribe; hence they are called *Wai nu*. They in general venerate Fuh,‡ and respect the priests of the Central Nation. They constantly sweep the family temples and the tombs of their departed ancestors. They procure sweet smelling flowers and delicate fruits [for offerings]; or failing these, with venerable priests of Fuh they approach the ancestral tombs.

These people hold their lives cheap. If they have transgressed the law, and the matter become public, they go to a sequestered spot, and destroy themselves,§ so as not to involve others. The laws are extremely severe against quarrels and strife. They speak very gently to each

\* A vermilion salve used by Chinese ladies for the lips.

† To improve the complexion.

‡ The Chinese transcription of Buddha.

§ This account is confirmed to the letter by M. Titsingh, who says, "When a person is conscious of having committed some crime and apprehensive of thereby being disgraced, he puts an end to his own life to spare his family the ruinous consequences of judicial proceedings. This practice is so common that scarcely any notice is taken of such an event. The sons of all people of quality exercise themselves in their youth for five or six years, with a view that they may perform the operation, in case of need, with gracefulness and dexterity; and they take as much pains to acquire this accomplishment, as youth amongst us do to become elegant dancers or

other, and when they summon their servants, they do so by clapping their hands.

They have no traffic in slaves ; but they engage themselves for a certain time, and on the lapse of that time they return home.

Two nations are tributary [to *Yi pan*]. On the north is *Má táo*, which is bounded by *Chiu sín*.\* *Chiu sín* pays tribute through *Má táo*, and *Ma tao* remits it to *Yi pan*. On the south is *Sá tsi má*, bounded by *Liu khiu*.† *Liu khiu* is tributary to *Sá tsi má*, and *Sá tsi má* to *Yi pan*. The kings of both islands obey the commands [of the king of *Yí pán*.]

The seasons are similar to those of *Shán tung*, *Kong nán* and *Chi kong*.

*Chang kí* and *Pho tho* lie east and west of each other, at a distance of forty *kéng*. *He man*‡ is distant from *Chang kí* sixty-two *kéng*. With a north wind you go from *Wu tao man* ; with a south wind from *Thin thang man*. By *Ma tao* lies the road to *Ting chiú* : *Sa tsi ma* is the road to *Wán thài*. These countries produce gold, silver, copper, varnish, porcelain, every variety of flowers, and printed goods. The sea produces *lung yin heong*, the fish *fu*, bichu de mar, and every kind of [marine] vegetable.

The hills of *Sá tsi má* are full of caverns ; from these issue deep and cold streams admirably adapted for tempering cutting instruments. They produce also horses, and very strong men.

In the times of the Emperor *Ke tsing*,§ there were freebooters from *Wai* at *Sa tsí ma*. Merchant ships from *Yi pan* anchor at *Yung ké*, because formerly eighteen fishermen of *Wai*, being driven by a strong wind to the *Middle Kingdom*, crafty men,|| through their instrumentality, excited an insurrection. They wore beards and shaved the hair skilful horsemen : hence the profound contempt of death which they imbibe even in their earliest years. This disregard of death, which they prefer to the slightest disgrace, extends to the very lowest classes of the Japanese.—Titsingh, *Illust. of Japan*, page 148.

\* On the Chinese map this is laid down on the southern extremity of the Korean peninsula ; *Má táo* must be the island *Tsu sí ma* of our maps. They are not included in the Chinese map.

† The Islands called *Loo choo*, on our maps. I cannot, in the absence of native maps, identify *Sa tsí ma*, but a little further on we are told it lies to the north of *Liu khiu*.

‡ Amoy.

§ *Ke tsing* of the Ming dynasty, reigned from 1522 to 1567, A. D.

|| i. e. of the Chinese nation.



on their foreheads. They learnt the language of the country in a secluded spot. Others joined these and they commenced plundering. The multitude called them *Wai nu*. They afterwards, being overcome, returned to their own nation, eighteen men in number, and were punished by the king according to the law. From that time to the present, their ships have been forbidden to come to the Central Nation: and although we go to their country, they dare not come to ours. In the history of *Wai*\* an account of these eighteen persons is given at large.

Proceeding from *Pho thó* to *Cheang kí*, you cross the sea of *Wang yang*, in a direction from east to west. The wind raises vast and dangerous waves. There is an adage that “*Yi pan* hath good things, but *Wu tao* is hard to pass.”

Proceeding from *Hea man* to *Chang khi*, with the south monsoon, you sight *Kí lung shán*,† on the island *Thái wán*.‡ Going north to *Mí khong yáng* and *Heong thín yóng*, you again sight the great hill of *Sá tsí má*, and *Thín tháng*. The course is parallel with the needle. As for the two seas called *Hong yáng* and *Thém yáng*, the first, in the midst, resembles chaff [in colour?], and the latter resembles mushrooms. Hence they are called the *Sea of rice-chaff* [*Mí khong yáng*], and *Hong thín yáng*, the *Sea of mushrooms*. To the south of *Sa tsí ma* is *Líu khiu*. It lies on the rhumb *yæt*,§ and is distant sixty-eight *kéng*. The natives of the interior practise the literature of the Central Nation. The people are weak and the kingdom poor. They produce copper-vessels, paper, sea-shells, indigo, and tortoise-shell, but have nothing else to give in exchange for clothing and necessities for the inhabitants. The tribute passes through *Fu chiu*. These people have long been known and seen, and it is unnecessary to describe them more fully here. *Líu khiu* lies to the south of *Yi pan*. All the waters flow to the eastward. *Chang tsí*|| hath said that water once covered *Mí læ*, but at what time is unknown; and *Chang tsí* never lies!”

The third chapter gives an account of Formosa, and is entitled

\* Japan.

† The most northerly cape of the island of Formosa.

‡ Formosa.

§ East 15° South.

|| The name of a Chinese sage.

“TUNG NAN YANG KI,\* or *An account of the South-East Ocean*. All the oceans of the south-east begin at *Thái wán*† and lie to the south [of that island].

*Thái wán* is situated on the magnetic rhumbs *shin sín*.‡ From *Kí lung shán*, on the north, to *Má khi* on the south, it is two thousand eight hundred *li*§ in length. It lies opposite to *Fu chiu fu*, *Heng chiu fu*, *Choen chiu fu*,|| and *Cheang chiu fu*. It is separated from the island of *Pháng ú\** by a navigation of four *kéng*,† and from *Hea man* by a navigation of eleven *kéng*. Its western side is a marshy wilderness; its eastern is bounded by the ocean. This part is inhabited by the vassals *Yin yu*, named the “aborigines of *Pháng pu*.”

The hills are very lofty, and are inhabited by people whose numerous races it were difficult to count. They catch deer and eat them. Yams and roots‡ constitute their staple food. They have no reckoning of years. When the grain is ripe, they prepare a wine from it and regale themselves: and that is their year. By nature they are fond of murder; and they preserve the skulls of men as something precious. They tattoo their bodies, and blacken their teeth. Their races are various. In the morning when they hear the birds sing, they proceed upon their business as the omen§ is lucky or otherwise. The men and the women couple illicitly, and that is their marriage.||

## \* 東南洋記

† *Thái Wán* is the Chinese name of Formosa. It has generally been applied by European writers to the port only.

‡ 辰巽 *shin sín*, corresponding with S. E. (*sin*) and E. 30° S. (*shin*) on our compass.

§ *Li*: Stadium Sinicum, continens trecentos et sexaginta passus. *De Guignes*.

|| These are provinces of Fo kien.

\* A group of islands lying off the coast of Formosa, called “*Pescadores*” by the Spaniards, and “*Visschers Eilanden*” by the Dutch. Valentyn describes them minutely. The largest he calls *Phek no*; no doubt a corruption of *Pháng u*.—(*Beschryv. van Taywan*—p. 37).

† *Keng* is, in time, the 10th part of the day of 24 hours; in measure, 60 *li* of navigation, as our author himself informs us a little further on.

‡ *Shæ u*. I am doubtful what esculents these may be; most probably yams.

§ *Pi*, properly a method of inferring omens by burning tortoise-shell, but here it means an omen in general.

|| This passage is differently rendered by M. Klaproth:—“*Les hommes et*

In the times of the emperor *Tsung ching*,\* the *Red Hairs*, named *Ho lán*,† took possession of the great port of *Ngán pheng*. They erected a fortress of three stories to protect the opening to the sea. They taught the natives to till the ground, and induced them to study the literature of the *Western Ocean*.‡ They carried on a traffic in deer's skins with *Yi pan*,§ in which they employed the natives as laborers, and harassed them so, that existence became intolerable.

In former times *Cheang chí lung*|| dwelt upon the sea. He married a Japanese woman named *Yung sí*, of whom was born *Shing kung*. Many tens of *Wai nu*\* followed him, and they anchored together at *Thái wán*. From the outer sea they reconnoitred the island, but could do nothing [more]. He therefore made war upon *Kong nan*, *Chi keang*, *Fo kien*, and *Yæt tung*,† saying to his son, "Should we be unsuccessful there, [we shall return] and have perfect repose in *Thái wán*." *Cheang shing kung* made war therefore upon *Chín kong*, was repulsed, and returned. He remained watching *Kín mun* and *Hea mun*, and devising schemes to capture *Thái wán*. He brought together the interpreters of the *Ho lán* nation, named *Ho pan* and *Fu í*, leadsmen of *Lo í mán*, who knew well where the water of the port was deep and where shallow. These directed *Shing kung* to collect the ships and proceed in a body. The *Ho lán* carefully guarded the great harbor of *Ngán pheng*. *Shing kung* set out from *Lo í mán*, and aided by a great inundation of 30 cubits or more, entered and took possession of *Thái wán*. There was a long struggle with the *Ho lán*, because he persisted, saying, "*Thái wán* belonged to our former kings, and is still inhabited by *Wai nu*. Take away whatever you

*les femmes se réunissent dans les champs pour les cultiver.*" Valentyn states that the women perform all the agricultural labor.

\* *Tsung ching* of the *Ming* dynasty reigned, according to the tables, from 1628 to 1644, A. D.

† The Dutch.

‡ Europe.

§ Japan.

|| This must be the famous *Coxinga* of the Dutch, who expelled the latter from Formosa. Valentyn gives full particulars.

\* That is, Japanese.

† The province of Canton.

possess ; restore us the country ; and your money and goods we will not touch." The *Ho lán*, thoroughly informed of the multitude, went away.

In the twenty-second year\* of *Khang hi*, *Cheang khe shang* submitted, and the country was entered upon the maps.† *Shing thin fu* became thenceforward *Thái wán fu* ; *Thing peng chiu* became *Chæ lo æn* ; *Wan nín chiu* became *Thái wán æn* and *Fung shán æn*. In the second year of *Yung ching*,‡ *Chæ lo æn* was divided into two, the northern portion becoming *Cheang fwa æn*.

To the south-east of *Shá má khi*§ of the district of *Fung shán*, is *Læ sung*,|| situated on the magnetic point *sin*.\* It is a navigation of 72 *keng* distant from *Hé mán*. On the northern side is a mountainous region, which seen afar off resembles the teeth of a saw. Its common name is *Chái ngiu háng*.† These hills are inhabited by aborigines, who belong to *Læ sung*.

To the west, north, east, and south of *Shá má khi*‡ there are many islands at a distance ; but only one island is contiguous to *Thái wán* : its name is *Hong theo æ*.§ It also is inhabited by aborigines. No ships traffic there, because the language is altogether unknown. They live upon yams and roots and the productions of the sea. The country produces gold dust.

There are lofty hills in *Læ sung*, which extend round from the north, at *Chái ngiu háng* towards the south-east. In former times the natives of the Great Western Ocean, named *Kan si la Shi pan ya*,|| took pos-

\* A. D. 1684.

† That is, became a recognised portion of the Chinese empire ; as a consequence, of which the provinces seem to have received Chinese names.

‡ 1725, A. D.

§ The most southerly part of the island.

|| Luçon, one of the Phillipines.

\* South-east.

† The "ditch or fosse for slaughtering oxen."

‡ This is the most southerly cape of Formosa.

§ There is no other island on our maps that answers to this description, but *Botel Tobago Xima*.

|| Klaproth transcribes these words *Kan szu la Chi pan ya* : hence, in the edition of the original in his hands, the first syllable must have been 干 and not as in mine 干, which may be easily supposed to be a typographical error. M. K.'s



session of it. It produces a grain 5 or 6 *fán* \* in length. Many people from *Cheang chiu*, and *Chæn chiu* cultivate this grain and carry it to other countries. They pay an annual personal tax of five or six pieces of gold to reside there. Traders are kept apart in one corner. They are separated from others and not allowed to transgress the boundaries. They, also, pay taxes according to their trade. Of all the foreign countries of the *South-east Ocean*, *Læ sung* is the most prosperous; because the *Kan si la Shi pan ya* of the Great Western Ocean bring silver there for commerce. Silk, silken cloth, cottons, and a hundred varieties of merchandise are sold. The productions of other countries are brought in great abundance. † The established religious doctrines are those of the *Great Western Ocean*. ‡ They have erected fortified cities and fortresses for the foreigners. The country originally belonged to the aborigines; but now it is possessed by foreigners.

When the people of *Hán§* marry a woman of this country, they must adopt the heretical doctrines, and worship the Lord of Heaven in the church. They use oil and water, and write the character *shi* || on their forehead. The name of this water is *water of sprinkling*. They burn incense in honor of their fathers and mothers. When their old people die, they go to the church, dig a grave, and there deposit the body. The rich spend more or less money, and bury their dead in the church, within the foundations.\* The poor are buried without the walls.

reading is no doubt the correct one, and is the Chinese transcript of “*Castillian Spaniards*.” The “*Great Western Ocean*,” is equivalent to “*Europe*.”

\* *Fan*, is the hundredth part of a cubit.

† M. Klaproth translates this passage, “*Le nombre des indigenes s’est accru considerablement :*” an evident mistranslation, “in the island the produce of foreign countries (*fân thu cháng*) is collected in clouds.”

‡ Europe.

§ i. e. China.

|| That is 十, the Chinese *ten*; the cross.

\* M. Klaproth translates: “*Les riches font, a cette occasion, plus ou moins de dépense, selon l’état de leur fortune, et elevent des monumens sur la tombe.*” The

text is 基內 *kí nai*, *within, on the foundations*; which is antithetical to the mode of burying the poor in the next sentence, 塋外 *tseang wai*; “*outside the walls.*”

Every three years they make a clearance and cast away the bones in a deep mountain stream. Whatever property the deceased may have possessed, is proclaimed in the public hall, and is divided into three parts,—amongst the church, the widow, and the children.\*

They have a bad sickness [in the mode of inducing which] the mothers instruct the daughters and not the sons. They have a way of charming cows' hides and smoked hams, and reducing these to the size of a grain of sand. Whoever eats of this his belly swells and he dies. Frogs, too, and several kinds of fishes are in like manner bewitched. They can moreover dissolve these charms and make [the fishes and frogs] leap out of the mouth again.

The crime against nature is prohibited. Even fathers, sons, and brothers are not allowed to sleep on the same bed. The doors are kept open at night, to hear and to see; and the beds and the mats are carefully examined. If they be detected, they are punished by fine.

Early in the morning a bell is rung, and it is day; the markets and the shops are opened for trade. At noon, the bell is again rung, and it is night! The market is closed, all go to sleep, and none venture abroad. In the evening the bell is rung once more; and it is day! Lamps and candles shed a clear light and trade proceeds. At midnight, again the bell rings, and it is night again! The shops and the markets are closed. Every *shi shin*† it is alternate day and night. At noon day they prohibit the whole country [to trade]. Verily it is a market of devils!

After a journey of twelve *keng* you arrive at *Li tsi pha*, and twenty-one *keng* more bring you to *Kan ma li*,‡ to both which places the ships of *Han* proceed for purposes of commerce. South-east of *Li tsi pha* is an island, opposite to which are five other islands, namely

\* M. Klaproth has evidently misunderstood this passage; which he translates,—“Ceux qui sont d'une maison riche, cherche à briller dans l'église principale,” &c.

The words translated “*maison riche*” 家資 *ke tsí*, means “*family property*,” and that translated “*briller*” 明 *ming*, means to *proclaim*, as well as to *shine*. Besides, the matter of burying was disposed of by the clearing out the bones in the former sentence, and the author has now passed to another subject.

† *Shí shin*; 6 hours.

‡ Camarines? the S. E. peninsula of Luçon?

*Pan ngai*, *A tang*, *Sú mú*, *Míu mu yín*, and *Mang kía tsí nu*.\* Many vessels from the central nation traffic there also. These islands are inhabited by aboriginal natives, and the productions are the same as those of *Læ sung*, such as deers' horns, cows' hides, nerves, and flesh, Brazil wood, ebony, sandal wood, balsam, yellow wax, swallows' nests, bichu de mar, and various other things. To sail thither you must proceed from *Læ sung* to *Li tsí pha*, and thence southerly. From *Læ sung* to *Pan ngai* are ten *kéng*; to *A tang*, twenty-three *kéng*, to *Su mu*, 24 *kéng*; to *Man kiu tsin nu* fifty-eight *kéng*. The men of these islands are very ignorant; they comprehend nothing; they accumulate no property. They require only a little cloth from the Central Kingdom to cover their persons. Each tribe has its chief to protect the national rights.

South-east of these you come to *Wan lao kao*,† and *Ting kí í*. These two kingdoms are situated on the magnetic rhumb *tzí*.‡ The natives and the various productions are similar [to the preceding]. The distance by sea from *Læ sung* to *Wan lao kao*, is 174 *kéng*. To *Ting kí í* it is 210 *kéng*.

From *Læ sung* due south is a great mountain, the general name of which in *Wu la yu* is the *Great hill of Si lí*.§ To the east of this hill is *Su lo*.|| In ancient times it never paid tribute; but in the sixth year of *Tung ching*\* there arrived tribute viá *Man*.† To the west

\* In the map prefixed to the History of the Philippine Islands, by Martinez de Zuniga, there are 5 or 6 large islands south of Luçon, amongst which only one or two seem to have aboriginal names, namely Panay [*Pan ngai*], Zebu [*Sú mú*?] These are no doubt the islands here spoken of.

† Moluccas?

‡ 15° S. of S. E. — or more properly, E. 55° S.

§ M. Klaproth has I think misunderstood this passage. He makes it—"De *Líu soung* droite au sud, est une grande montagne; elle n'a pas de nom général, mais elle est extrêmement étendue." The mistake rises from the first syllable of the word *Wu láí yu*, (Malay) being taken in its literal acceptance, "not;" but how the remainder of the sentence is construed as above I do not know. The same mistake occurs further on. The place alluded to must be in the northern part of Borneo.

|| *Su lo* must be the Sooloo Archipelago of our maps, between Borneo and Mindanao.

\* 1729 A. D.

† i. e. Fo kein.

of this is *Ki li man*; and again to the west is *Wan láí*;\* these constituted in ancient times the kingdom of *Pho lo*. Proceeding yet further west, is the great hill of *Chæ ko tsú la*, and to the south of that, *Ma shín*.† The extent of these hills has never been ascertained: their interior has never been trodden by man. They produce wild beasts, whose very kinds are unnamed. *Su lo*, *Ki lí man*, and *Wan láí*, are three kingdoms all lying in the southerly rhumbs from *Læ sung*; and to reach *Chæ ko tsú lo* you must proceed south from *Tsí chæn yang* in *Yæ nan*, passing *Kwan læn*, and *Chá phan*, and thence easterly, 188 *kéng*, which brings you to *Chæ ko tsú lo*. To reach *Ma shín* also you must go by *Chá phan*, and *Ká lá pá*, and thence a navigation of 340 *kéng*. From *Hea man*, viâ *Læ sung* to *Su lu*, the distance does not exceed one hundred and ten *kéng*.

Again, to the eastward the sea separates a region named *Mang kiá shí*. From *Ma shín* to *Mang kái shí*,‡ the distance is twenty-seven *kéng*. Further east is *Ting kí í*,§ and on the north-east is *Wan lao kao* and *Su lu*.

*Ki lí mán*, *Wan la kao*, and *Chæ ko tsú lo* are generally called in *Wu la yu*,|| *O fán*. The natives are very fond of copper gongs; and all their utensils are of copper. They dwell in huts along the banks of rivulets. Their manners are rude. They never remove their swords from their persons,\* and are very dextrous in the use of the spear. Whenever it draws blood, death follows. They dress in single pieces of printed or coloured cloth. The merchants of that country travel to and fro in a kind of small boat called *máng kea*. They proceed in company and divide the profit with each other.

The produce of these countries consists of pearls, camphor, tortoise shell, bichu de mar, birds' nests, ebony, sandal wood, sea weed, rats,

\* Borneo, called also *Brunai* on our maps.

† Banjermassin?

‡ Macassar; more properly Mancassar, I believe.

§ New Guinea??

|| *Malayan*. Klaproth again misapprehends the term:—"ces pays ne sont pas connus sous une denomination generale,"—is his version of this passage.

\* M. Klaproth translates this passage, "Leurs corps resiste aux coups de sabre!" a translation the absurdity of which is self-evident. The meaning is simply that they sleep with their creeses. The word he translates "resiste," 離 *li*, means to remove: and were it not so, the word *shín*, body, is in the wrong position, syntactically, as the complement of a verb active.



and so forth. The natives of *Ma shín* resemble the preceding. They are exceedingly cunning and treacherous. The *Red Hairs* are already in possession of their port, and aim at taking the whole country. The natives are afraid of their artillery, and dare not fight them : but retiring to the hills, secrete themselves, and with herbs poison the upper parts of running streams, and then themselves go out of the way.

The country produces steel, diamonds, pepper, sandal wood, brasil wood, ratans, nutmegs, camphor, lead, tin, birds' nests, kingfishers' feathers, bichu de mar, &c. The diamonds are of five various colors ; those which are golden, black, and red, are the most esteemed, for if they be put at night in a dark room, they emit a clear light. If even put into muddy water, or covered with a napkin, their light will shine through. But they prize most of all such as are as large as a die.\* These are valued at 100,000 *leang*.† The natives of the Western Ocean barter for it their most precious commodities.

From *Læ sung* to *Kí lí mán*, the distance is thirty-nine *kéng*: to *Wan láí*, forty-two *kéng*. All these are the foreign kingdoms of the *South Eastern Ocean* : but *Chæ ko chiu lo* and *Ma shín* are not on the road from *Læ sung*, and ought properly to be entered among the kingdoms of the *South Ocean*. The same with respect to *Su lu*, and *Wan láí*, and the chain of mountains running north and south. But we have given them along with the *South-east Ocean*, in order to set forth their position with greater distinctness."

The fourth chapter, describing the countries immediately South of China, is entitled

"NAN YANG KI,‡ or on account of the Southern Ocean.—All the kingdoms of the SOUTHERN OCEAN have the Central Kingdom some what to the east. Examined thence by the magnetic compass, they lie

\* M. Klaproth has mistaken the meaning of this passage, which he translates "ordinairement les indigènes portent, comme ornement détête, un de ces bijoux, grand comme une piece de damier, et qui a la valeur de cent mille ouces d'argent !" a very ordinary ornament no doubt ! The mistake has arisen from the use of the

word 首 *sin*, "head," as a superlative in the text ; as we say *head man*, for *chief man*. The die here referred to is of a hemispherical shape and about half an inch in diameter or more.

† *Leang*, about a dollar and half.

‡ 南洋記

betwixt the rhumbs *ting* and *wí*; but from the GREAT WESTERN OCEAN of the universe, they lie upon the points *sin* and *tsæ*.\*

To speak first of *Ngán nán*;† it immediately joins the Central Kingdom. Its sea bounds *Lim chiu*. Its hills turn towards the north-west, and then south towards *Chim shing*, in form resembling a half moon. The name is *Kwang nán wán*.‡

Under the *Thsín* it was [denominated] *Tséang kwan*; under the *Hán*, *Káo chí*; under the *Tháng*, *Káo chiu*; under the *Sung*, *Ngán nán*, and under the *Ming*, *Káo chí*. It joins, in succession, both the *Yæt*,§ and *Yon nán*. The manners of the people and their productions have been already described in the historical books.

All beyond *Shan fwa*, *Sin chiu*, *Kwáng í*, and *Chim shing*|| is denominated *Kwáng nán*: for the maternal uncle and brother-in-law [of the Emperor?] having been sent to watch *Shan fwa*, they accordingly fixed upon the fort of *Ma lung kó*, on the north side of a river, and another fort belonging to *Káo chí*, as the boundary. All to the south of *Shan fwa*, as far as *Chim shing*, is the kingdom of *Kwáng nán*, called also *Ngán nán*. The family name of the king is *Yæn*; he springs from a family of the Central Kingdom. The country was formerly called *Yí nán kwan*. It produces gold, the wood *nán*, perfumes, lead, tin, cinnamon, ivory,

\* M. Klaproth, I think, misconceives this passage. He translates it, “Si l’on examine le monde avec l’aiguille aimantée, on trouve que tout ce qui est situé entre les rhumbs *ting* et *wei* est entouré par le grand océan occidental, et que sur le reste des vingt quatre division de la boussole, il n’y a de terres que par les rhumbs de *sien* et *szu*.” He adds in a note, “ce passage est un peu obscur dans le texte; je pense pourtant en avoir saisi le sens.” A moment’s reflection that the *Great Western Ocean* is Europe, and that betwixt it and the countries here described the *Little Western Ocean* (comprising India, Persia, Arabia, &c.) intervenes, would have satisfied the translator that such cannot be the Chinese author’s meaning: nor is there any equivalent in the original for the words *il n’y a de terres que par*, &c.

合天地包涵大西洋按二十四盤分之卽在巽巳矣. *Ting* is S. 15° W. *wí*, S. 30° W.; *Sin*, SE., and *tsæ* E. 60° S.

† Or *An nán*.

‡ Or the *Bay of Kwáng nán*.

§ That is, the two provinces of *Kwáng tung*, and *Kwáng si*.

|| These four countries are in Cochinchina.

fine silk cloth, birds'-nests, fish-fins, the vegetable *chí tsái*, sugar, and other things like *Káo chí*.

*Káo chí* is named *Tung king* (or the eastern capital); and *Kwáng nán*, *Sí king*, or the western capital. It is more powerful than *Káo chí*. On the south are *Lo láí*, *Tung po cháí*,\* and *Kwan tá má*. The south-west borders with *Tsím lo*;† the north-west with *Mín tín*.‡ They plant prickly bamboos around their towns. The natives are excellent divers. When a ship of the *Red Hairs*, driven by stress of weather, enters *Kwáng nán wán*, the people of the country send about a hundred little boats, the crews of which carry with them bamboo joints containing a quantity of fine cord. These dive into the water, and having nailed the fine cords to the bottom of the vessel, row quickly away, so as to drag the vessel aground in shallow water. They then pillage and burn her. Now the vessels of the *Red Hairs* avoid coming even in sight of the hills of *Kwáng nán*. Should they behold these, the master immediately tells the mate how the nation practises this severity.§

Proceeding from *Héa man* towards *Kwáng nán*, you pass by *Nán ó*,|| and sighting *Lo wán shán*\* in *Kwáng tung*, and *Tá chiu theo* in *Khing chiu fu*; cross the *Ocean of the Seven Isles* by the *Chim pa lót* mountain outside of *Kwáng nán*, and so reach *Kwáng nán*. They reckon the navigation to be seventy-two *kéng*.

*Káo chí* lies to the west of the *Seven Isles*, and to reach it you must go round by the north. From *Héa man* to *Káo chí* is a navigation of seventy-four *kéng*.

The *Sea of the Seven Isles*‡ lies south-east of *Khing tao* and *Wán*

\* This is the Chinese named of Camboja. See Crawford, *Embassy to Siam and Cochín China*.

† Siam.

‡ Ava.

§ M. Klaproth turns this passage,—“le capitaine dit à l' équipage.” “Mes amis,

ce long pays là est bien dangereux.” The word 長 *chang*, means indeed “long,” but it belongs to the preceding member of the sentence, and forms with the word

累 from a compound meaning “mate.” (See Morrison's Dict. Vol. I. p. 81.)

|| This is the island marked *Namoa* on our maps lying about 70 or 80 miles to the south-west of Amoy.

\* In the Canton province.

† Champeilo.

‡ This is that portion of the China Sea situated South of the Canton province

*chiu*. All who go to the *Southern Ocean* must pass this sea. The junks of the Central Nation are not to be compared with those of the *Western Ocean*. These make use of sextants and quadrants to determine the sun's altitude, and measure the time, and so find out the ship's position. The Central People use the compass and the sand-glass, and as the wind is strong or light, fair or foul, determine the number of *kéng*. Each *kéng* is equal to a sea-distance of about 60 *li*. If the wind is fresh and fair, the amount may be doubled. When the current and the wind are contrary, they reduce the reckoning. In this way they know their position. If there be any uncertainty in their minds, they determine their position by the distant mountains, distinguishing upwards and downwards, the forms of the hills; and they use the lead to ascertain the depth of the water. On the bottom of the lead are put wax and oil to try the sand or the mud by touch (contact). Every one of these plans is fit and proper where the place admits of it; but in the *Great Ocean of the Seven Isles*, and outside of *Tá chiu theo*, there are only vast waters, and no hills to serve as land-marks. With a very favourable wind, and the assistance of the needle, this sea may be crossed in six or seven days, when you sight *Chim pa lo* in *Kwáng nán*, and *Wái lo shan* on the outer sea; and thus get the clew again.

Somewhat easterly you come upon [the sands] *Wan li cháng sha*\* and [the rocks] *Chin li shi tang*.† Care must be taken to avoid being drawn into the gulf of *Kwáng nán*; for without a westerly wind it is impossible to get out again. Such merchant ships as enter it, not being bound for *Kwáng nán*, enter it by the direction of heaven.‡ Goods are taxed excessively; one half the value is not deemed sufficient. The *Red Hairs*, men and things, are not to be found. But they show great reverence from the Central Nation. Hence it may be said, that if you lose but a little, you lose ten thousand *li*.

In the centre of the *Ocean of the Seven Isles*, there is a species of supernatural bird, resembling in form a sea-goose, but smaller. Its bill is sharp and red: its feet are short and green; its tail bears an arrow about two cubits in length. It is called the *Arrow Bird*. It flies towards vessels passing in the centre of that ocean and shows itself.

and East of Cochin China, and in the center of which are the Paracels,—the Seven Isles of the text.

\* Macclesfield Bank.

† The Paracels.

‡ That is against their will.



It points [the road?] to the people ; but if you call, it flies away. At times it seems to hesitate ; if again you call it, it looks about cautiously, and again it flies away and returns. [The sailors] burn paper as an offering to the spirit. It flies round and round, and none knoweth its place. But tradition says, that when the royal *Three Precious Ones*\* descended, they summoned a bird from the *Western Ocean*, and planting an arrow in it, bade it dwell in the midst of this ocean as a memorial.†

From *Kwáng nán* you pass round *Shán hái* and arrive at *Chím shing* and *Lo lái*. Thence going to the west you arrive at *Tung po chái*. From *Hé man* to *Chím shing* is a voyage of one hundred *keng* ; to *Tung po chái*, of one hundred and thirteen *keng*. *Tung po chai*, though a distinct kingdom, being enclosed betwixt the two kingdoms of *Kwáng nán* and *Tsim lo*, on the east it pays tribute to *Kwáng nán*, on the west to *Tsim lo*. Should it fail in the least to obey these, by water and by land they can invade and reduce it.‡ The natives are *Wu lá yu White Heads*.§ They go nearly naked, girding only the lower part of the body with a piece of cloth called *shœi mán*. The country produces lead, tin, ivory, kingfisher's feathers, peacocks, ocean-cloth, red wood, sandal wood, incense, swallow's nests, sea weed, and ratans.

From *Tung po chái*, a range of hills turns round to the south-west toward *Tsim lo*. From *Tsim lo* you pass round the coast to *Sí tsí*, *Lu kwan*, *Ta nín*, *Ting ka nu*, and *Phang hang*. The mountains separating these from the Central Nation, extend in a due southerly direction thus far, and stop. Again, going round the sea, and the back of the hills towards the west, where *Pháng heng* terminates the hills, and at the back of this is *Yu fuh*.||

\* 三寶 *Sán pao*; the *tri ratna* of Indian Buddhists; that is *Buddha*, *Dharma*, *Sanga*; or according to the Chinese the past, the present, and the future Buddha, that is *O mi to fuh*, *Shi kea fuh*, and *Mi le fuh*. Our author seems here and elsewhere to use the term as a proper name.

† This legend is entirely omitted by M. Klaproth in his translation of the chapter.

‡ M. Klaproth. "Peu à peu il est cependant devenu indépendant. Par mer, chacun peut y entrer et le subjuguier,"—a circumstance not calculated to promote its gradual independence!

§ M. K. "Il n'y a pas de mahometans portant le turban blanc."

|| Johore?

Westward of *Yu fuh* is *Má lá ká*, and the hills behind *Ting ka nu*.

Westward from *Má lá ká*, you enter the kingdoms situated to the south-west of *Yón nán* and *Thían chu* ;\* namely, *Kó shi thá* of the *Little Western Ocean*.

From *Tsím lo* round the coast as far as *Yu fuh*, every state has its king; but all obey the orders of *Tsím lo*. In ancient times *Lo* and *Tsím* formed two kingdoms. These were afterwards united and formed *Tsím lo*. They commonly worship *Fuh*. The king dresses in clothes dyed with images of *Fuh*. His food is all gilt, and is served on vessels of gold. By land he travels upon an elephant; by water on a boat adorned with dragons and phoenixes. The name of their magistrates is *chin kwa*. In the presence of men of rank they sit cross-legged, and bow with uncovered bodies and naked feet. They do not dress in trowsers, but wrap themselves in a *shœi man*. They entertain great respect for the Central Nation, and generally employ the people of *Hán* as magistrates. These superintend the political affairs and the treasury. Their city and suburbs are extensive. The people dwell in houses fronting the rivers. The rivers are full of alligators. From its embouchure to the capital, the river is two thousand four hundred *li* in length.† Its waters are deep and broad, admitting sea-going vessels to enter and depart. It penetrates to a branch of the *Hwáng ho*.‡

\* *Thían chu* is one of the Chinese names of India. *Kó shi thá* is perhaps the Portuguese term *Costa*.

† M. K. "Il y a dans le fleuve beaucoup de crocodiles, qui le remontent depuis son embouchure jusqu' à la residence du roi. Le cours de ce fleuve est de 2400 *li*; ses eaux sont profondes et larges, et les vaisseaux de mer y entrent et sortent. C'est une branche du *Hoang ho*," &c. M. K. has confused the two sentences, and made the entire length of the river 2400 *li*; a circumstance the author could never have meant, when in the same breath he tells us "c'est une branche du *Hoang ho*."

‡ Although it is not very probable that this great river reaches the *Hwáng ho*, as our Geographer affirms, yet the sources of these streams cannot be very remote from each other. In his *Geography of Cochinchina* the Bishop of Isauropolis remarks: "Maltebrun and many others have placed the source of this river in the province of Yon-nam in China. But I am persuaded that this river flows from the mountains of Thibet. In a short time I have no doubt that we shall obtain proof of what I have advanced. It is indicated in the map of Cochinchina, and the extraordinary inundation of this river about the month of September proves also that the melting of the ice of Thibet, is the cause of its overflowing its banks and spreading its waters

Its shores are covered with extensive forests, abounding in large apes and monkeys, and in beautiful birds whose songs are heard in all directions. The villages of the natives are numerous, and the cultivation is extensive. In the season of cultivation, entire families proceed in boats to dig and sow\* [the lands]: and having finished that, they return home, without remaining to weed. When the grain is ripe, they proceed back again by boat, and reap it. The stalks of this paddy are about twenty cubits in length. The tribute is paid in the produce of the soil. As they finish planting the young rice, the waters of the *Hwang ho* come down. The young plants increase with the waters: if these rise one cubit, the rice grows one cubit: if the waters rise ten cubits, the rice grows ten cubits. It is in no wise destroyed or injured. When the waters retire, the rice ripens. One branch of the river enters the Central Kingdom. Its current is very violent. Another branch enters the countries to the west, and turning again through *Tung po chái* and *Tsim lo*, enters the sea with a moderate current. The lands are greatly enriched by its waters, and hence the country is very productive of rice; the very stones seem propitious.

It is generally asserted that they catch deer on the tops of trees. They draw their cattle upon a raised platform lest these too be carried away and lost by the current like the deer. They remain on platforms on the tops of trees. They have huts, too, in the vallies, erected in the midst of the water. They take their cattle up into these. Should a man be eaten by a tiger, or swallowed by an alligator, they respectfully announce it to the native *sang*.† The *sang* utters imprecations, and the tiger approaches; with incantations they throw a cotton thread in

over Camboge and lower Cochinchina, and causing the same fertility as the Nile does in Egypt. What Maltebrun speaks of a traveller having arrived at Laos from China by descending one of the rivers and crossing a lake, does not prove that the Camboge river has its source in China; this on the contrary accords exactly with the Cochinchinese map; about the 23d or 24th degree of latitude one of the rivers, which flows from the mountains of Ligum-nam, enters the great river of Camboge. This Portuguese traveller must have taken the junction of these two rivers for a lake." (J. A. S. VII. 322).

\* M. Klaproth, "à l'époque des travaux champêtres, ils ferment leur maison, cachent leurs bateaux et leur rames, et s'occupent de l'agriculture."

† 僧 The Chinese transcript of the Sanscrit *सङ्ग* *sanga*.

the water, when the alligator spontaneously binds himself. They cut up and examine him, whether the body still exist. Whosoever has got dropsy, goes to the *sang*, and entreats a charm to deliver them from it. Hence they generally revere the doctrines of *Fuh*. When the rich die they are buried in graves. Over these erected are towers of Shih (Sákya).

Now, there is a kind of man and woman named *shi lo mán*. They differ not from [other] men, save that their eyes have no pupils. People intermarry with them and have male and female offspring. During the night they transform their spirits into wolves and dogs, and in conformity with the nature of these, proceed to foul places, and feed on excrement. Towards dawn, they return to their soulless bodies. If, in their heavy sleep, you turn their bodies, the spirit cannot return to them. The women conduct business. The men amuse themselves by spurning lime juice on them. Tears flow in abundance from their eyes, and they cannot endure it. \* \* \* \* Hence the people erect their dwellings over streams, where there is facility of ablution.

Again, there is a species of men called *kung*. The word *kung* signifies enchanted. Swords or knives cannot wound these. The king employs them as soldiers of his guard. If they violate their duties, they are fitly punished. The *sang* commands their transformation by imprecations, and compels them to abandon their condition of *kung* as a punishment.

In that kingdom, many worship demons. Tradition affirms that when the *Three Precious Ones* arrived in *Tsím lo*,\* the inhabitants were very few, and the worship of demons was predominant. These entered upon a strife with the *Three Precious Ones*, that who should overcome, should there abide. In one night each [party] completed a temple and a tower. It was about dawn, and the temple of the *Three Precious Ones* was yet without a roof:† but lo! the tower of the demons was complete. [The *Three Precious Ones*] caused a wind to blow the tower aside, and with his cloth-cap roofed in the temple. To this day that

\* Buddhism, according to M. Klaproth was diffused through Siam in A. D. 607, when intercourse first began between that country and China.

† M. Klaproth translates somewhat differently: "Le lendemain celui des Trois Precieux se trouvait entièrement achevé, et le toit convert de tuiles; mais voyant que le tour des démons était également terminé, ils excitèrent un vent," &c. In the original the expression is, 未及 "not completed."



tower stands oblique in the court yard of the temple of the *Three Precious Ones*. The decayed ropes still exist in the roof. Foreign vessels tie a piece of cloth resembling this cap to the mast to make the ship light and quick, and to this they attach sails, in the manner of studding sails, availing thus of the strength of the wind without causing the vessel to lie over.

When the natives are sick they always go to the *Three Precious Ones*, and solicit medicine. If the medicine prove not beneficial, they cast it into the river, and are ordered to bathe. From that time to now the natives and the people of *Tháng* continue to bathe in rivers and besprinkle themselves with water when they are sick. All the natives of the outside sea call the people of *Hán, Tháng jin*, because in the time of the *Tháng* [dynasty] intercourse began [with those countries].

When the people die, their bodies are burnt and [the ashes] afterwards buried, to escape divine judgments. Again, one class, seeking tranquillity of mind, make an oath that after their death they will serve as food for birds or of fishes. This tranquillity of mind consists in indifference to the body. The bodies of those who seek tranquillity by birds, are exposed upon rocks among the mountains. The birds fly round about them, and assemble. Then enters a crow with red beak and feet, and gives the first peck. All the crows then descend, and in a moment only the skull and bones remain. They gather and bury these. Such as seek tranquillity by fishes, are burnt to ashes; these are gathered and made into pieces with flour and thrown into the river. Some there are who in this manner feed both the birds and then the fishes.

These people build large ships capable of carrying ten thousand *shí*. They supplicate wood for masts from the great trees in the mountains. They first, with incantations, supplicate in sincerity and faith; and then strike with the ax. If they proceed not thus, fresh blood issues from the tree, and those engaged in the work instantly die. They employ oxen to drag the cart, and on the road play and rejoice. When the charm is addressed advisedly, should the tree not obey, those who should eradicate it and bring it away to their store, are certain to die.

The country produces silver, lead, tin, ocean-cloth,\* aloe wood, ivory,

\* According to M. Klaproth this means Indian cloth: but the author so often

rhinoceros' horns, ebony, sanders wood, camphor, sandal wood, kingfisher's feathers, cow's horns, deer's sinews, ratans, mats, the mats called *kai wan tsih*, rhubarb, fir seed,\* nutmeg, swallow's nests, bichu de mar, and sea weed. The money is of silver. The largest is equal to four *chhin*, the middle to one *chhin*; the second to four or five *fan* and the smallest to two *fan* and five *li*. Their name is *fáh*.† The kings smelt and seal the coin. It is unlawful to cut or employ it [in the arts]. They are exchanged for cowries.

In navigating from *He mán* to *Tsim lo* you pass the *Sea of the Seven Isles*. You sight *Wai lo shan*; and further south, *Tai moi chiu* and *A chiu*. You then sight *Kwan læn*,‡ and somewhat to the west *Ta chin yæ*, and *Siao chin yæ*; and thence turning to the northwest is *Pih ka shán*. Thence northerly is *Chuh yæ*, in the mouth of the port of *Tsim lo*; altogether one hundred and eighty-eight *keng*. You ascend this river forty *keng*, making the entire navigation two hundred and twenty-eight *keng*. On the east it is bounded by *Tung po chái*, at a distance of about one hundred and thirteen *keng*. It is so distant because to the southern face of *Tung po chái*, there is an extensive region of mud, formerly on that account called *Lan ni mi*, adjoining the hills *Ta wáng shán* and *Siao wáng shán*. Hence it is necessary to make a long detour.

To the south of *Tsim lo* is *Ché tsi*, *Lo kwan* and *Sung keo*, all belonging to the kingdom *Tsim lo*. Those of *Ta nín*, *Kih lin tán*, *Ting ka nu*, *Phang hang*,§ follow each other successively around the hills. All lie to the westward of *Siao chin æ*, a voyage of probably one hundred and fifty or one hundred and sixty *keng*. They produce lead, tin, kingfisher's feathers, fine mats, swallow's nests, bichu de mar, ratans, camphor, and similar things. But the pepper of *Ting ka nu* is of superior excellence. The natives of that country are all of the *Wu la yu* race.|| They do not comprehend principles and religion. They go applies the term to the cloth of other countries that I take it to mean simply foreign cloth. Morrison says, "any thing that comes from abroad is represented by *yang*" (ocean).

\* A seed used in medicine.

† The ticul.

‡ Pulo Condor.

§ There is a town and a river named *Pahang* on our maps, situated to the north of Singapore, which is no doubt the *Phang hang* of our author. *Ting ka nu* is *Tringan*; *Kih lin tán* is *Calantan*; and *Ta nín*, *Patani*.

|| M. Klaproth—"Les habitants de toutes ces contrées sont sans doute de la même race."

about naked, carrying swords. They gird their lower part with a piece of cloth. They chew betel-nut and tobacco. They eat rice steeped in water. They never trade with [foreign] ships.

Next is the kingdom of *Yu fuh*, the hills of which join *Phang hang*, situated at their foot. To go thither, you proceed from *Kwan læn*, on the magnetic point *mi*, by *Chhá pan*\* and turn west to *Yu fuh*. It is reckoned a voyage of one hundred and seventy-three *keng* from *Hea man*. The manners of the people are the same as the foregoing, and the productions are also similar, but, compared with these, better and more abundant. Each year three or four merchant vessels may load there. They go to the ships and barter. The country produces gold dust. The people smelt it and make it into small pieces for money, each weighing four or five *fan*. Silver money is not current.

To the west of *Yu fuh* is *Má lá ká*, also belonging to the *Wu la yu* tribe. Their magistrates are called *A' ye*. The king of that country, like the king of *Tsím lo*, employs the people of *Hán* in the administration, and in the management of the treasury. The country produces gold, silver, cloth of the western ocean, rhinoceros' horns, ivory, lead, tin, pepper, sandal wood, sanders wood, swallow's nests, kingfisher's feathers, fine mats, and so forth. Money, both of gold and silver, is current. The sea-going ships of the Central Kingdom never pass beyond this to the *Western Ocean*. They go thus far and stop. It is a voyage of two hundred and sixty *keng* from *Hea mán*. The system of the *Little Western Ocean*,† the *Kingdom of the Black Devils*,‡ and the *Great Western Ocean*§ begins here. The ships of the *Great Western Ocean* frequent these countries, as we shall see in our account of the *Great* and the *Little Western Ocean*.

To the south over-against *Má lá ká* is an island separated by the sea, and named *A thsi*.|| It belongs to the *Red Hairs*, who dwell there. All the ships of the *Red Hairs*, going to the countries of the *Little Western Ocean*, must pass this place to take in rice and water. From *A thsi* the great hills extend towards the south-east to the promontory of

\* The island of Singapore ?

† Western Asia, India, &c.

‡ Africa.

§ Europe.

|| Acheen.

*Wan ku læ*, which is separated from the opposite coast of *Ká lá pá* by the sea. The ships of the *Red Hairs* returning to the *Great Western Ocean*, must pass through this sea: and thence proceed south-west to the *Kap*\* of the *Black Devils*, and turn westward to the *Great Western Ocean*.

Now to speak of the voyage from the Central Kingdom to *Ká lá pá*;† you must go by *Kwan læn* and *Chhá pan*, guided entirely by the point *wi* of the needle. You go west as far as the hills of *Wan ku læ*‡ and thence to *Ká lá pá*. It is reckoned a voyage of two hundred and eight *keng* from *Hea man*. It originally belonged to the *Wu la yu* country, but now the *Ho lán Red Hairs* possess it. The officers are denominated *Ká pi tán*. Beyond these are the three countries of *Hea kong*, *Wán tán*,§ *Chhi wan*. The first produces pepper. *Wán tán* is a separate country. *Chhi wan* produces pepper and sandal wood. But *Ká lá pá* is the most productive of all these places; hither the ships of all countries come for commerce: here are to be found all the valuable commodities of the Central Kingdom, the *Great Western Ocean*, the *Little Western Ocean*, the *White Heads*, the *Black Devils*, and the *Wu la yu*. The *Ho lan* have a city there, and divide the country. There are many natives of the Central Kingdom settled there for trade and agriculture. Every year they pay a tax of five or six pieces of gold each, and receive a ticket of permission to dwell. The number of the natives of the Central Kingdom is very great; it may be about a hundred thousand. Now the *Ho lan* have prohibited more from settling: they send back such as come in ships.

The island of *Chá pan* is situated to the south of *Kwan læn*, east of the hills *Wan ku læ*. It is on the highway of the navigation of these parts. The inhabitants live by fishing. It produces grass for fine mats of the very best quality. But each year produces enough for only two mats for the palace of the king. These mats are never infested with ants or other insects. They are worth forty or fifty pieces of gold. The second quality are worth twenty to thirty. Those that are worth one or two pieces of gold are still very beautiful and superior to cloth."

\* Cape of Good Hope.

† Java.

‡ Bencoolen.

§ Bantam.



The next chapter is entitled *Siao sí yang kí*, or an Account of the Little Western Ocean. Under this denomination are included India, Persia, Arabia, and the countries north of the Himalaya as far as the sea. The account however is so extremely meagre and uninteresting, consisting of little more than a catalogue of names and a statement of rude distances and bearings, that I will not detain the reader with further details.

The sixth Chapter is entitled *Ta sí yáng kí*, or an account of the Great Western Ocean, by which is understood Europe, and Africa, or the Kingdom of the Black Devils. It is even less interesting than the preceding, and is evidently gleaned from imperfect European materials.

Two short chapters conclude the work: one giving an account of the island called *Kwán lœn*, the *Con non*, or *Pulo Condor* of our maps; and the other describing a small island in the China sea named *Nún ó khi*.

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#### MISCELLANEOUS.

*Notes on the Rev. F. MASON's Paper "On the Shells of the Tenasserim Provinces."\** By W. H. BENSON, Esq.

(Communicated by Dr. T. Cantor.)

*Helix procumbens*, Gould. This is *Helix delibrata*, Benson, (*Journal Asiatic Society*, 1836.)

*Helix anceps*. This shell differs from *Helix serrula*, Benson, in its more depressed spire and flatter apex, its less developed sculpture, comparatively smooth periphery, contabulate whorls, and larger size with the same number of whorls. There is merely a perforation also, instead of an umbilicus. It is quite distinct and a good species, though of the same group as *H. serrula*.

*Helix honesta*. This shell is at once distinguished from *Nanina vesicula*, Benson, by the angularity of the last whorl, a character not so observable in *N. vesicula*.

*Helix saturnia*, Gould. This shell is not contained in Pfeiffer's Monograph. The whorls are too few for it to agree with *H. chevalieri*, (Souleyet) and in that particular and in size it agrees better with *H. oxytes*, Benson, which may stray down thus far from the north, as well

\* See *Journal of the Asiatic Society*, Vol. p.

as *H. delibrata*. Without fuller characters however, it is impossible to determine.

*Helix* "*zabata*," Gould, is clearly a misprint for *H. gabata*.

*Helix retrorsa*, (not *retorsa*,) Gould, proves to be distinct from *H. interrupta*, Benson, and *H. himalayana*, Lea. The formation of the umbilicus is peculiar.

Under the head of *Streptaxis pectiti*, the name of the author Souleyet is misprinted ("*Souleget*.")

*Cyclostoma pernobile*, Gould. Pfeiffer notes this shell as a synonym of *C. aurantiacum*. Schumacher (nec Sowerby), a near ally of *C. perdis*, Sowerby, and places both shells in the Sub-Genus *Cyclophorus*, Montf. Pfeiffer observes: "Ein prächtiges *Cyclostoma*, welches Hr. Dr. Philippi zugleich mit den oben (154) erwähnten von seiner Reise mitgebracht hat, bestätigt vollständig meine früher ausgesprochene Vermuthung, dass *C. pernobile*, Gould, von Tavoy, dieselbe Art sey, welche Chemnitz abgebildet, und Schumacher *Annularia aurantiaca* genannt hat. Jenes ist in Mergui gesammelt worden und entspricht, mit Ausnahme einer etwas dunkleren Färbung, völlig der Beschreibung und Abbildung von Chemnitz, so wie auch der Beschreibung von Gould. Zwar ist der Kiel an dem vorliegenden Exemplar um ein Geringes weniger scharf, als bei der Abbildung von Gould; wir wissen aber wie veränderlich dieser Character gerade bei dieser Gruppe ist, und so dürfte bei der Identität des Vaterlands kein Zweifel mehr über diese ausgezeichnete Art Statt finden, welche zwar von Müller und Chemnitz mit *C. volvulus* zusammengeworfen wird, aber jedenfalls ihre specifische Selbständigkeit zu behaupten im Stande ist."

*Cyclostoma sectilabrum*, Gould.—Pfeiffer refers this shell, as well as *C. croceum*, Sowerby, to Guilding's Sub-Genus *Megalomastoma*. It is quite distinct from *C. croceum* which belongs besides to the Mauritius. Pfeiffer says under the head of *Cyclostoma croceum*: "die von Gould ausgesprochene Vermuthung dass die Art mit seinem *C. sectilabrum* zusammenfallen werde, sich wohl als ungegründet erweisen dürfte, indem die von Gould angegebenen Charaktere by *C. croceum*, Sowerby, durchaus nicht vorhanden sind."

*Bulinus atricallosus*, Gould. Reeve has figured this species, but inclines to the opinion that it is a mere variety of *B. citrinus*. Pfeiffer enumerates it among the varieties of *B. perversa*, (*citrinus*,) without

any hesitation. The Pinang variety, with the ordinary aspect of the species, but with a purple chesnut colour on the parietes of the aperture, confirms the opinion.

*Clausilia insignis*, Gould.—The species sent under this name is very distinct from the species from Malacca, which I have described in MS. as *C. stylus*, and which I find in Mr. Cuming's collection under the name of *C. chinensis* from Java. Possibly this name may be intended for *cochinchinensis*, Philippi, the description of which I have not seen, and which appears to be recognized as distinct by Pfeiffer, from *C. insignis*, Gould. In May 1847, in referring to the Mergui *Clausilia philippiana*, he says: "mit *C. insignis*, Gould, nahe verwandt," a circumstance which, however, I cannot well understand, as *C. philippiana* has only six whorls, and the specimen of *insignis* sent has nine. *Clausilia insignis* differs altogether from *C. stylus* in its smooth sculpture, its greater ventricosity, more blunted apex, the form of the mouth and the number and disposition of the plicæ in the interior.

*Vitrina præstans*, Gould. Mr. Mason errs in saying that this is the largest species of the Genus. In 1836 I described *V. gigas*, which is  $1\frac{3}{8}$  inch in greatest diameter.

*Helicarion cassida*, Hutton, described in 1838, is one inch two lines in diameter, and an allied Abyssinian species equals it in size.

*Achatina octona*. The shell alluded to under this name, or that of *octonoïdes*, is *Achatina erecta*, Benson, of the Chusan series. There is a *Bulimus octonoïdes*, Adams, belonging to the group to which *B. gracilis*, Hutton, belongs, a shell very nearly allied to *Achatina erecta*.

The small red *Pupa mellita*, Gould, may possibly be *P. bicolor*, Hutton, the animal of which, like many of the Mauritian *Pupæ*, is yellowish and vermilion. *Pupa bicolor* I have taken from Calcutta up to the foot of the Himalaya in Rohilkhund, as well as at Galle in Ceylon, and Dr. Cantor took it at Pulo Pinang.

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*On a spontaneous combustion of Coal wetted with salt water, on board the ship Sir Howard Douglass, Capt. OGILBY. By HENRY PID-DINGTON, Curator Museum of Economic Geology.*

#### PART I. NARRATIVE.

In a pamphlet printed by me for the Lords Commissioners of H. M. Admiralty in June 1847\* and which has been reprinted at home in the Nautical Magazine for 1847, the following passage occurs :—

“When coal reaches the ship it should be carefully examined and it should be noted if wet with fresh or salt water.”

And the note to this says :—

“It is said that a coal-laden vessel was recently burnt at Aden from the Master’s having wetted his coal with the salt water to increase the weight, and I have heard it said that coal wetted with salt water is more dangerous. As a new set of chemical actions would go on between the salt water and the pyrites and copperas this may not be improbable.”

Up to that period this was all, I believe, that was known on this side of the Cape on the subject of the combustion of coal wetted with salt water. But the recent arrival in the port of Calcutta of a ship which had narrowly escaped burning in consequence of her coal heating, after being wetted with salt water, was an event calculated to afford so much information on the subject that I have taken every pains to procure the fullest accounts of it and to investigate the changes which the coal has experienced : I begin by a narrative of the facts.

The ship *Sir Howard Douglass*, Capt. Ogilby, of 715 tons burden, from Newport to Bombay, laden with coal for the Peninsular and Oriental Steam Navigation Company, ran on the 15th of January 1838 into a hurricane of excessive severity, in about Lat.  $11\frac{1}{2}^{\circ}$  S. Long.  $80\frac{1}{2}^{\circ}$  East, and, being thrown on her beam ends, her cargo shifted, she lost her mizenmast, topmasts, rudder, &c. and was for a time in considerable danger of foundering. She however reached Point de Galle and refitted there as she best could, and proceeded on her voyage towards Bombay

\* *A cheap, simple, and certain method of obtaining early warning of any approach to spontaneous combustion, or ignition by accident, on board of steamers, coal or other ships; and of instantly conveying water nearly to the spot, with chemical notes and practical deductions for the use of sailors.*



by the southern route ; but on the 20th of April, being then about on the Equator and in Long. 80° East, twelve days out from Point de Galle, and *ninety-five days after the hurricane*, her log says :—

“At 9 A. M. sent the watch down in the hold to heave up some coal between decks and trim up for the lower hold close up to the beams to ease her from rolling. After digging down from 3 to 4 feet found the coals charred and very hot. Before reaching Galle nothing of the kind was observed, although we had previously trimmed ship by the coals in consequence of hauling the chain cables on deck from aft. When in Galle roads no sign appeared of heat more than we found before, the heat now being so excessive. After a consultation of the officers and crew it was concluded on to make for Ceylon or the nearest port with all dispatch for the preservation of the ship and our lives. At 10 A. M. wore ship to the N. W. ; people employed filling all the small casks with water and taking them on deck, some getting the boats ready in case of being wanted.”

They ran up, having favourable winds, past Ceylon, and arrived safely at Calcutta, where from enquiries made on board I learned,

1. That the coals were smoking when broken out, but the stanchions or lining were not charred. They were also smoking when broken out at Calcutta.

2. She had during the hurricane probably as much as 3 or 4 feet of water in her bilge, which lay for three or four days till the ship was trimmed upright.

3. The greatest heating was for a space of about 55 feet, amidships, between the fore and main hatchways, and at about 10 feet deep. There was but one focus or heated mass, and the coals in the bilge were not heated.

4. The after-hold coals were not heated, and these were shipped dry at Newport, while the fore-hold ones were shipped wet during heavy rainy weather and were the worst.

5. No foul air was noticed at any time in the hold, nor any sulphureous smell, but while retrimming ship after the hurricane, and at Point de Galle, the whole of the hatches had been kept open, so that if any was generated it was dissipated as fast as formed.

6. Capt. Ogilby says he has no doubt that the salt water was the cause of the heating of the coal.

7. During the time of heaving the coals overboard (after the hurricane) and trimming, no heat was perceptible, nor was any found on trimming ship by the coals on the 10th March, the day before her arrival at Point de Galle, and which was 54 days after the hurricane. The coals came from Russell & Co.'s Priscoe Pit at Newport, S. Wales; the ship was a good deal detained for want of coal by a strike amongst the workmen, so that "Mr. Russell," says Capt. Ogilby, "may have got coals from some other pit to help us along unknown to me."

8. The Dock Master at Newport informed Capt. Ogilby that "he had never heard of spontaneous combustion taking place in coals shipped from Newport (or that side of the hill as they call it), although it frequently happens to those taking coal from Cardiff; and not long since a vessel had her decks blown up and was otherwise damaged by an explosion.

9. Capt. Ogilby adds that the ship *Urania*, which he commanded in the Bombay trade, had two narrow escapes previous to his joining her from the coal shipped in Liverpool merely for dunnage taking fire. The first time, as soon as the cargo was out and the coals begun upon, and the second time just as she had got to anchor and broken into the after-hold to get up the passengers' baggage.

#### PART II.—*Chemical Examination.*

Visiting the ship for the express purpose I could only obtain small fragments, which were said to be part of the damaged coal, the whole of which I was informed was buried in one of the two heaps which the cargo formed when it was landed at the Peninsular and Oriental Company's wharf. The steamers *Haddington* and *Precursor* coaled from these heaps, but their officers failed to find any damaged coal amongst the heaps, and this, although in the case of the *Haddington*, I had written to a highly intelligent officer on board to be on the look out for it. Hence it would seem that as far as external appearances went, there was not in the main body of the heated part any very great change. Still as we know that considerable heating might go on (as in the case of emitted gases) without much alteration in mere appearance, I have subjected what I could obtain to careful examination, of which I now state the results.

#### *The pure undamaged coal.*

This is a very bright glance, and indeed a highly specular coal on the

cross fracture, and in the sunshine, after a shower of rain, it is perfectly radiant with the bright places, which have often a pavonine lustre, and the abundant laminæ of pyrites which are all disposed like them vertically to the horizontal planes. On the horizontal places of the blocks, which are something less than six inches thick, the lustre is a dark velvet black and few or no traces of the pyrites are seen except in minute veins, often forming rhomboids which mark the intersecting edges of some of the larger laminæ. In a few instances the vertical plates of pyrites are replaced by plates of calc spar.

Its specific gravity is ..... 1.290

Its analysis gives per cent.

Hygrometric water, .....	2.25
Gaseous and Bituminous matter, .....	24.50
Iron and a little silex and lime, .....	4.75
Carbon, .....	69.00
	<hr/>
	100.50

The excess is from the peroxidation of the iron.

What was given to me as the damaged coal on board the *Sir Howard Douglas* was evidently nothing more than the *top coal*, or coal shales at the top and bottom of the seam, and upon examination this proved to be the case, for it contained 38 per cent. of ash, its constituents per cent. being,

Hygrometric water, .....	1.65
Gaseous and Bituminous matter, .....	14.17
Ash ; Iron, silex and lime, .....	37.82
Saline matter, principally sulphate of iron, from decomposed pyrites, .....	4.35
Carbon, .....	44.18
	<hr/>
	102.17

Excess as before from the peroxidation of the iron.

This result is only so far useful as that it shews that considerable heating may go on without much, if any, apparent change in the structure and appearance of the coal, and that this may take place after so long an interval as *ninety-five* days! after being damaged by salt water, and I have therefore thought it highly worthy of being placed upon record.

*A supplementary note on Captain SHERWILL'S Meteoric Iron. By*  
HENRY PIDDINGTON.

In my remarks on the remarkable form of this meteorite, I have suggested, p. 545, Journal Nov. 1848, that it might perhaps be owing to its having fallen in a semifluid state as a mass of melted metal, diagonally, on a yielding soil, and that the *foot* might be thus formed. By a singular piece of good fortune, which rarely indeed occurs to theorists, I am enabled very greatly to add to the probability that this was really the case, by the following parallel instance, in which nature has certainly performed for us the very experiment which I suggested, of projecting a semifused mass of metal on a soft surface.

In a rich collection of volcanic rocks and minerals from Vesuvius,\* presented by T. B. Swinhoe, Esq., there are two of the well known *Bombe Volcaniche* (volcanic bombs) one of which is a flattened elliptical disk about  $3\frac{3}{4}$  inches long by 3 inches wide, and 1 inch thick, as in the annexed sketch, of which one is the horizontal section and the other a vertical one.

It will be seen that this may be termed a complete embryo of our Acrolite, though its substance is a common leucitic or pearlstone porphyry, or cineritious lava. It has on what must (from the position of the centre of gravity) have been the lower part, the rudiments of a foot, of which, as in the meteorite, the axis is about in one of the two centres of the ellipse, and it evidently, from the smoothness of the surface, on which are incrustated grains of hornblende or augite, which are not seen internally, has been in a state of fusion. Now these bodies, we know, must fall vertically, but if they fell on a slope, which this probably did, and in a soft soil of ashes or *rapilli*, they would be driven forward some distance in a soft state while cooling, as I have supposed our meteoric iron to have been.

Our volcanic bomb is cracked through the longer axis of the ellipse, and, at the prominence which may represent the foot, it has, as it were, burst open, as if some gases had suddenly escaped there. The ends are a little fractured, making the foremost one rather truncated, and I

\* But of which I regret to say all the labels are lost!



was obliged to break a small chip off to get a fresh fracture, so as to be certain of the internal structure.

In collections better furnished than ours it may be hoped that better specimens to elucidate this curious question may be found.

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*Earthquakes in Assam. Communicated by Major JENKINS, Agent to the Governor General.*

*January 22nd, 1849.*—Yesterday morning about a quarter past 8, we felt so severe a shock of an earthquake at Gowhatti, that it may be worth recording. After a very long interval, during which we have been entirely free from earthquakes, or only had a few slight tremblings, this occurred during a very thick fog which lasted until 11 o'clock; the weather for some time before had been cold and cloudy with N. E. winds, and on the 18th we had rain with a strong N. E. wind nearly all day. Some days before there had been heavy falls of snow on the second ranges of Bootan mountains, more I think than ever I recollect seeing in this neighbourhood.

When this earthquake occurred I was in my pinnace, preparing for embarkation, and the boat shook so violently that I thought some one was jumping on the gang-board, and when I went up to my house I found some of the ceiling of one room and the cornices of others had been much shaken. All who were in houses at the time describe the shock as one of the severest we ever had, and the rumbling as extraordinary loud.

*Jagee, Assam, January 26th.*—Your note of the 23rd has just reached me, noticing a violent earthquake at Gowhatti on the 22d, at about 8 $\frac{1}{4}$  A. M. On the same day and about the same time I was at Ruha in a Naumghur, when we felt a very severe earthquake; it lasted at least a minute, and the ground moved greatly, the trees also shook violently. It was also I hear felt at Nowgong, but I have not heard that any buildings were damaged. On the 23rd, at 9 P. M. I felt another strong shock of an earthquake at Jagee; at the same place on the 26th, at about 5 A. M., just as I was getting up (it was not light) I heard a rumbling noise like the movement of heavy guns, and the earth moved but not so violently as on the 22nd and 23rd, or so long. On the 17th, I





marched to Jumoona-mookh ; the day was sultry and close, the next day, 18th, I set out to return to Ruha about 8 A. M., the weather still gloomy and close ; at 10 A. M. the rain came down heavily and continued without intermission all day and a greater part of the night ; the 19th was cloudy, the 20th cloudy and rain for some hours. 21st, the same kind of gloomy weather and a drizzling rain and a heavy oppressive atmosphere, so much so that I fully expected the approach of an earthquake, as my experience in Assam is that I have invariably observed we are sure to have earthquakes when the weather is gloomy and the atmosphere dense, not a breath of air stirring or thing moving ; on the 22nd, the weather was still close ; on the 23rd during the day the sun came out but was occasionally obscured, and the atmosphere was heavy, and I felt oppressed whilst marching on the morning of the 22nd, and the evening of the 23rd ; not a breath of air was stirring. On many occasions I have observed this remarkable circumstance—a dead calm, a stagnation of the atmosphere, and a perfect stillness is sure to prevail before the occurrence of an earthquake, if not at the time. On the 24th, the weather still continued close and gloomy, heavy rain fell on Wednesday night ; the 24th, 25th, the morning was cloudy and the sun did not come out till the afternoon ; weather close and sultry. 26th, as I before observed, I felt another slight shock of an earthquake about 5 A. M., it was not severe, nor did it last so long as the others, but was accompanied with a rumbling noise, which the others were not. The shocks seem to come from the south-east, and to proceed northerly or rather north-west. I have been thus minute regarding these earthquakes that you may compare your own observations with my notes.

(Signed) J. BUTLER.

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*Earthquakes experienced in Assam in the latter end of January, 1849.*

*Capt. Dalton, Gowhatty.*—We experienced here on the morning of the 26th, two shocks of an earthquake, which were very remarkable, not so much for the violence of the shocks—for that was nothing to signify—but for the loud noise that preceded, accompanied and was heard some seconds after the trembling had ceased. There could be no mistake as to whence the noise proceeded ; I heard it distinctly two or



three seconds, before there was any sensation of a shock, gradually approaching and for some seconds after it had passed, and it distinctly notified the direction of perturbation and gave me a vivid idea of the rapidity with which it moved.

*Mr. C. K. Hodgson, Burpetah.*—I have the pleasure to send you some notes about the late earthquakes; the weather has been very changeable since the 15th, with rain occasionally, but I have observed that these earthquakes generally take place after a heavy fall of rain in the hills. They appear to come this year from the Himalayas, and not as in 1845, from the Cossya hills. The first one on Monday last (the 22nd) was rather severe, and caused a few cracks in the walls of my new house, but I am thankful that the injury was not worse.

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*Memorandum on earthquakes in January, 1849, at Burpetah, Assam.*

There was an earthquake felt at 8 A. M. on the 22nd January; it commenced with only a gentle undulation of the ground for about a minute, accompanied by the usual rumbling noise; the noise gradually became louder and was followed by a smart shock; apparently from the north, and then a second more severe one, which made the timbers of the house crack and rattled the doors and windows fearfully. The whole lasted for about a minute and half. The morning was very foggy and cold, with a sharp north-east wind, and the Thermometer in the shade down to 54°, or 6 degrees lower than it was on the previous morning, and the fog did not clear up until near noon.\*

There was another smart shock of earthquake at a quarter past 11, P. M. on the night of the 23rd, which also appeared to come from the north. And we had 2 more slight shocks about 6 A. M. on the morning of the 26th.

The following is an extract from my diary of the weather from the 17th to the 27th January, 1849:—

\* The weather as here described agrees perfectly with the weather at Gowhatty on the same morning. We had the same heavy rain on the 18th also.

Days of the month.	Thermometer in the shade.			Rain gauge elevation 5 feet.	Direction of the wind.	Remarks on the weather.
	Sunrise.	Noon.	Sunset.			
1849.	°	°	°			
January 17th,	56	66	68	„	N. East (strong).	Cloudy weather; strong N. East wind in the forenoon; Light N. East wind in the afternoon.
„ 18th,	61	62	60	0.600	North (strong).	Rain all day, with strong N. wind; a storm from the N. between 4 P. M. and Sun-set.
„ 19th,	58	66	67	0.450	N. East (strong).	Clear strong N. East wind. Light rain after 9 P. M. which continued nearly all night.
„ 20th,	62	65	68	„	N. East (Light).	Light clouds and light N. East wind.
„ 21st,	60	64	65	„	Do. (Do.)	Heavy clouds in the forenoon. Afternoon clear. Light N. East wind.
„ 22nd,	54	65	67	„	Do. (Do.)	Very foggy from sunrise until noon. 3 distinct shocks of Earthquake from the N. about 8 A. M.; afternoon clear with light N. East wind.
„ 23rd,	58	64	68	„	Do. (Do.)	Foggy for 2 hours after Sunrise; clear afterwards until sunset, when it became cloudy again. A smart shock of Earthquake at a quarter past 11 P. M. apparently from the North.
„ 24th,	60	66	66	0.050	Do. (Do.)	Light clouds in the morning, a slight shower of rain in the afternoon. Light rain again at night.
„ 25th,	60	65	67	„	Do. (Do.)	Light clouds in the morning. Clear afternoon.
„ 26th,	60	65	67	„	Do. (Do.)	2 Slight shocks of Earthquake from the North at 20 minutes to 6 A. M., cloudy all day.
„ 27th,	62	67	68	„	Do. (Do.)	Clear morning with light N. East wind in the forenoon. Westerly wind in the afternoon and cloudy weather after sunset.

*Addendum on the Battle field of Alexander and Porus, by Capt. JAMES ABBOTT.*

Since the despatch of my remarks upon the battle field of Alexander and Porus, I have by cross-examining persons acquainted with the mountain Mahabunn, discovered that the ruined fort which I supposed to be Aornos, upon the crest of that mountain, is called Balimah : and that there is another ruined fort further north upon the same crest, called at present Shah kote, or the king's castle. As this Balimah is immediately above Umm, we have here beyond a doubt the Umb Balimah to which Alexander moved his camp for the attack of Aornos : for it is scarcely possible that there should be a second union of two names which are so uncommon. Umb is on the western brink of the Indus, overshadowed by the Mahabunn and Balimah. And a camp at Umb (the highest point upon the Indus to which a camp can ascend), could be useful only for the assault of a fortress upon the Mahabunn. It seems therefore probable either that Shah kote is the Aornos of history, or that Aornos is merely a corruption of Awur (a fort) as supposed by Professor Wilson : and that it has been used in preference to the name Balimah, to distinguish it from the Umb Balimah where the camp was established. Immediately below Shah kote, the mountain having been cleft by the Indus, forms a natural wall of about 4 or 5,000 feet altitude, and as the attack seems to have been made from the river side, where Mahabunn has far more the character of a rock than of a mountain, it is easy to account for the appellation of rock given it by the Greeks to describe its extreme abruptness. It is common in this country to amalgamate together, for the sake of distinction, the names of two proximate villages or places. But as this Balimah is in the clouds, and Umb is in the river basin, it seems probable that in Alexander's day both belonged to the same chief, which is no longer the case : Balimah appertaining to the Suddoons, a race of Pathans, and Umb to Jehandad Khan son of the celebrated Poyndah Khan who so long held the Sikhs at bay. Umb is the capital of that chief. Immediately opposite and across the Indus the valley of that river is closed by projecting rocks called Durbund, and possibly so named by Alexander or his successors, after a similar process upon the coast of the Caspian. Durbund is the only locality in this neighbourhood connected by tradition with

the memory of Alexander, although the capital of Huzara (Sikundur-poor) still bears his name. So little is known of the Mahabunn by persons living on this side the river, that all my enquiries for Balimah had proved futile until just now, when a visit from Jehandad Khan has given me the clue.

*Errata in Capt. Abbott's former article.*

For elephants page 5, line 8, *read* elements.

Pubral p. 8, l. 21, ,, Pukrul.

burst p. 10, l. 19, ,, brast.

are p. 11, l. 25, ,, on.

first p. 12, l. 13, ,, just.

poems p. 15, l. 11, ,, Poëans.

part p. 16, l. 11, ,, post.

*List of the Rajahs of Sialkote, by the same.*

Although the following list of princes who have reigned over the ancient Raj of Sialkote in the Punjaub, is manifestly erroneous in the duration assigned to each reign, yet as it probably is all that is known of the dynasty, and as I live in hourly apprehension of losing all that remain of my papers, it seems to me that you may deem it worthy of preservation in the pages of the Asiatic Society's Journal. It is extracted from the fragment of an old Persian book which I procured at Sialkote, and of which the title page was lost.

From Raja Bruhm to Raja Saul Bahn, ..... 2000 years.

1. Rajah S. ascended the throne Anno 137 of Vikramajeet.
2. Rajah S. to R. Russaloo his son, ..... 90
3. ,, Hôdi, ..... 45
4. ,, Burjial, ..... 52
5. ,, Jypaul, ..... his son, 62
6. ,, Munnipaul, ..... ditto 72
7. ,, Mookundurpaul, ..... ditto 62
8. ,, Biddeypaul, ..... ditto 57
9. ,, Kishenpaul, ..... ditto 38
10. ,, Bynepaul, ..... ditto 59
11. ,, Kusspaul, ..... ditto 92
12. ,, Runjeetpaul, ..... ditto 62
13. ,, Runbeerpaul, ..... ditto 88



14.	„	Dunpaul, .....	his son,	34 years.
15.	„	Urjoonpaul, .....	ditto	53
16.	„	Luchmipaul, .....	ditto	49
17.	„	Goorditpaul, .....	ditto	79
18.	„	Diapaul, .....	ditto	46
19.	„	Soorutpaul, .....	ditto	63
20.	„	Sunnunpaul, .....	ditto	48

Here ends the Rajpootee Dynasty.

Total 1151

Or  $57\frac{1}{2}$  years per reign.

Furokhmah, .....	35 years.
Maimood Ghuznuvi, .....	9
Shahb-ooddeen, .....	40
Bullól Shah, .....	61
Sooltan Lodi, .....	49
Syud Jullal, .....	23
Khyrooddeen Ghorí, .....	32
Mir Timoor, .....	5
Nadir Shah, .....	$4\frac{1}{2}$
Koomaioon, .....	20
Ukhbur, .....	51
Noor-ooddeen, .....	24
Shah Jehan, .....	31
Aurungzebe, .....	34
Bahadoor Shah, .....	4
Ferokh Sér, .....	7
Jehandár Shah, .....	1
Ruffyut Durgah, .....	3 months.
Dowlut, .....	3 ditto.
Muhummud Shah, .....	30
Ahmed Shah, .....	3
Ali Gohr, .....	
Ukhbur Shah, .....	



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL  
FOR FEBRUARY, 1849.

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At a meeting of the Asiatic Society of Bengal, held on the 6th February, 1849,

J. W. LAIDLAY, Esq. V. P. in the chair.

The proceedings of the January meeting were read and the accounts and vouchers for January submitted.

Capt. Bazeley, B. A., was proposed as a candidate for election at the March meeting, by Dr. O'Shaughnessy, seconded by Lieut. Staples.

W. J. H. Money, Esq. C. S. proposed by Mr. Welby Jackson, seconded by Mr. Colvin.

Read letters—

From W. Seton Kerr, Esq. Under Secretary to the Government of Bengal, presenting for the use of the Museum of Economic Geology, a Map of Behar in 35 sections, and map of Shahabad in 16 sections. The maps were exhibited.

From Capt. Newbold, forwarding a note by Hekekyan Bey, Honorary Member of the Asiatic Society, on the strata cut through in excavating for coal in Wade Sherai.

From Capt. J. D. Cunningham, forwarding two inscriptions from the Jain temple at Muksee.

From Dr. Weber, Berlin, forwarding two sheets of his edition of the Vayasaneya Yajur, and recommending the Society to undertake an edition of the black Yajur.

From Dr. Roer, containing sundry propositions on the same subject. Referred to the Oriental Section.

From A. H. Blechynden, Esq. forwarding a stone inscription taken from a Mosque in Jessore.

Dr. O'Shaughnessy having published in a separate form a map of the country in the neighbourhood of the supposed site of the battle between Alexander and Porus, shewing also the position of the British army under Lord Gough, the expense of the same was sanctioned by a vote of the meeting.

Some discussion having ensued regarding the risk incurred by the Society in lending MSS. to members at a distance, it was proposed by Rev. Mr. Long, and seconded by Capt. Latter, that Mr. Elliott be requested to return without delay the vols. of the Mackenzie MSS. now three years in his possession.

Read a letter from Mr. Gutzlaff, enquiring for a Grammar and Dictionary of the Tibetan language.

On the motion of Welby Jackson, Esq. it was unanimously resolved that a copy of Csoma de Koros's Tibetan Grammar and Dictionary be presented in the name of the Society to Mr. Gutzlaff.

With reference to several small collections of botanical specimens in the Society's possession, it was resolved, on the motion of Mr. Welby Jackson, that these be sent in the name of the Society to the Superintendent of the Botanical Garden.

J. W. LAIDLAY,

*Vice-President.*

#### LIBRARY.

The following books have been received since the last meeting :—

#### *Presented.*

*Epistola Critica Nasifi Al-Jazigi Berytensis ad de Sacyum versione Latina et adnotationibus illustravit indicemque addidit A. F. Mehren. Lupsiae 1848, 8vo.*—PRESENTED BY THE GERMAN ORIENTAL SOCIETY.

*Zeitschrift der Deutschen morgenlandischen Gesellschaft herausgegeben von den Geschäftsführern. Zweiter Band III. heft.*—BY THE EDITOR.

*The Calcutta Christian Observer, No. 110.*—BY THE EDITORS.

*The Journal of the Royal Asiatic Society of Great Britain and Ireland. No. XVIII.*—BY THE SOCIETY.

*The Journal of the Indian Archipelago, Vol. II. No. XII. (2 copies).*—BY THE GOVERNMENT OF BENGAL.

*The Oriental Baptist, No. 26.*—BY THE EDITOR.

*Upadeshak, No. 26.*—BY THE EDITOR.

Tatwabodhini Patrika, No. 66.—BY THE TATWABODHINI SABHA.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of December, 1848.—BY THE DEPUTY SURVEYOR GENERAL.

The Quarterly Journal of the Geological Society, No. 15.—BY THE SOCIETY.

Map of the district of Shahabad, (16 sheets).—BY THE GOVERNMENT OF BENGAL.

Map of the district of Behar, surveyed by Capt. H. V. Stephen, 19th Regt. N. I. and Lieut. W. S. Sherwill, 66th Regt. N. I. in seasons 1841-2-3-4.—BY THE GOVERNMENT OF BENGAL.

The Transactions of the Royal Irish Academy, Vol. XVI. part 2.—BY THE ACADEMY.

*Exchanged.*

The London, Edinburgh and Dublin Philosophical Magazine, No. 220.

*Purchased.*

The Calcutta Review, No. XX.

The Bhagavat Gita, or Dialogues of Krishna and Arjoona, in eighteen lectures in Sanskrita, Canarese, and English. Edited by Rev. J. Garrett, Bangalore, 1846, 4to.

The North British Review, No. XIX.

Journal des Savants for September, 1848.

The Annals and Magazine of Natural History, No. 11.

Contes Rendus, Hebdomedaires des Seances de l'Academie des Sciences, Nos. 12—17.

*Report of the Curator Museum Economic Geology for the months of January and February.*

*Geological and Mineralogical.*—I have received from Major Jenkins, Agent to the Governor General in Assam, some notes of earthquakes in that district, which I have put into a separate form for the Miscellaneous notices of the Journal, as all these phænomena should be carefully registered.

Mr. T. B. Swinhoe has presented us with a box containing a large and very valuable collection of rocks and minerals from Vesuvius, being upwards of 250 specimens, but unfortunately every label belonging to them has disappeared, so that we have not the advantage of knowing their localities and the dates of the eruptions! Nevertheless they will supply us with many fine specimens, and with the series and remnants of collections we already have, and which I have carefully collected, we shall be able to make up a fine series of volcanic rocks and minerals.

I have had the good fortune to discover in this collection a specimen of a volcanic bomb which I think strongly, if not completely confirms my theory of



the manner in which the puzzling *foot-like* appendage to our mass of meteoric iron and to other acrolites may have been formed. I have put the details of this into the form of a supplementary note for the Journal, with a sketch.

From Mr. W. H. Sweedland we have received a miscellaneous collection of rocks from Palamow and the stations on the Ganges.

To Col. Low of Penang, we are indebted for two fine specimens of a shell conglomerate, with one of a dark grey limestone and clay slate, but I have not got any notice of the locality.

*Economic Geology.*—With Mr. Swinhoe's collection of Vesuvian minerals already mentioned we have also to acknowledge from that gentleman a specimen of yellow enamelled plaster, and a fragment of brick, both from the walls of Herculaneum, as also an ancient earthen lamp from the same place.

I have obtained a splinter of the fine red Aberdeen granite of which the pedestal to Lord Auckland's statue is made, and which was broken off one of the inner basement stones on board the Marlborough.

Lt. Haughten, B. N. I. has presented a very fine little crystallised diamond from Sumbhulpore, with several specimens of rocks, containing minute portions of copper from Chota Nagpore, but nothing worth attention farther than as an indication that there may be veins.

I have put into the form of a paper for the Journal my examination of some coal from the ship Sir Howard Douglass, which was on the point of igniting 95 days after it had been wetted with salt water in consequence of the ship, which was coal laden and bound to Bombay, having been thrown on her beam ends in a hurricane, during which time the cargo shifted, and I have added specimens of the coal, which is of a remarkably pyritous kind from the Priso Pit near Newport in South Wales, to the collection of the Museum.





# Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of Feb., 1849.

Lat. 22° 33' 28". 33 N. Long. 88° 23' 42". 84 East. Mag. Variation 2° 28' 36" East. Mag. Dip. 27° 45'.

Days of the Month.	Observations made at sunrise.						Maximum Pressure observed at 9h. 50m.						Observations made at apparent noon.						Observations made at 2h. 40m. p. m.						Minimum Pressure observed at 4 p. m.						Observations made at sunset.						Maximum and Minimum Thermometers.			Rain Gauges.		Days of the month.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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# JOURNAL

OF THE

# ASIATIC SOCIETY.

MARCH, 1849.

*Notes on the Languages spoken by the various tribes inhabiting the valley of Asam and its mountain confines. By WILLIAM ROBINSON, Inspector of Government Schools in Asam.*

The study of the affinities of languages has always been acknowledged to be one of importance. When properly applied, it cannot fail to afford an unerring test of the truth or falsehood of traditionary evidence : and without its aid, it would sometimes be impossible to unravel the mysteries of contradictory testimonies respecting the relations of the different races of mankind.

Yet no one branch of study, probably, is attended with greater difficulties in the prosecution, especially as regards the languages of unconnected and barbarous tribes, remote from all contact with literature or civilization. It is seldom to be expected that points of resemblance can be found sufficiently numerous to afford any thing like demonstrative evidence of the affinity of languages under these circumstances. And even where we do meet with identity in any given number of words in any two languages, nothing can be inferred from this coincidence, respecting the relation of those two languages. For, if the fancied resemblance or identity of a certain number of words,—unless, indeed, the proportion be very considerable—were to be esteemed a sufficient proof of their having been derived from a common stock, it would follow that more than half the languages of the universe would exhibit traces of such connection, in whatever order we might pursue



the comparison. For, in the migration and intercourse of nations and tribes, nothing is more common than the permutation of letters and the borrowing of words, causing an appearance of affinity where in reality none exists. It is, therefore, only to an essential affinity in the structure and genius of languages (coupled with verbal coincidences) that we can appeal for certain evidences of a common origin.

Setting out from the establishment of a certain number of separate languages as species, we may adopt the tests of affinity proposed in Adelung's *Mithridates*, and proceed to comprehend in the description of one *family* such as have more coincidences with each other than diversities; and refer to the same *class*, such families as exhibit any coincidences at all that are not fortuitous, imitative (that is, from onomatopoeia,) or adoptive. But, these tests depend so much on the progress of our knowledge in the study of each language, that the results must unavoidably be liable to great uncertainty and fluctuation where our acquaintance with the languages is superficial, so that we can reasonably expect nothing more than an approximation to an arrangement completely methodical.

The writer, therefore, whose attention has been but lately drawn to the languages of Asam, and whose opportunities for studying them, have been but few, begs here distinctly to disavow any intention of attempting to trace the languages he treats of to their sources, or to explain their affinities. So important an undertaking, may be much more rationally expected from the united labors of many than from the feeble efforts of a single individual. Yet it is obvious that the task never can be accomplished unless efforts are made by individuals for communicating such information as they may have opportunities of acquiring, and though the writer may have failed in laying open the real nature of each language, he would indulge the hope that there is yet such a foundation laid, as will eventually secure its being done.

Proceeding now to the examination of the languages spoken in Asam, and by the tribes bordering on the valley, the one that naturally claims precedence is the **ASAMESE**.

It is the language usually spoken by the entire population of the valley, and in most cases, is the only medium of intercourse used between them and the people of the hills.

With the exception of the Bengali, there is probably no derivative

of the Sanskrit, that bears a closer affinity to its parent, so that nearly four-fifths of the words in common use are pure derivations from that stock. Like its cognate the Bengali, it admits of the introductions of Sanskrit terms with such facility, and to so great an extent, as to be capable of conveying ideas with the greatest precision, thus adding considerably to its copiousness.

Whether it be a direct derivative of the Sanskrit, or only a corrupt dialect of the Bengali, has been questioned. It seems highly probable, however, that a careful investigation will conduce to the support of the latter supposition; for there does not seem to be a greater diversity between what are usually considered the *provincialisms*, spoken in the remoter parts of Bengal,—in Chittagong and Silhet for instance,—and the unadulterated Bengali of Nuddeah (where the language is said to be spoken in its purity), than between any of these and the dialect of Asam.

From the circumstance of the country having from time immemorial been governed by rulers of Shán origin, it is somewhat surprising that more traces of their language are not to be found in the present dialect of the Asamese. The very small proportion of words that may be traced to Tai origin, appear for the most part to be adventitious. This might serve to show that long previous to the invasion of the Shán conquerors or the inroads of the hill tribes, the valley was inhabited by a race intimately connected with Bengal or Berar, and this conjecture would seem to be confirmed by the traditions of the old kingdom of Kamroop, and several antique Hindu remains in the most remote parts of the valley, which have but recently been brought to notice by the archaic researches of Major Hannay.

After a careful comparison of the Bengali and Asamese dialects, we make no hesitation in asserting, that, except with slight variations of pronunciation, upwards of eight-tenths of the most common words are identical. So strong an affinity may not be perceptible on a cursory inspection of any given number of words taken from the two languages, in as much as the secondary forms in current use in Bengal would most likely be overlooked, and these, in many cases, come far nearer to the Asamese terms than those words commonly used in Bengali composition.

For the purpose of comparison, a list of words in both the Bengali and Asamese dialects is here subjoined. And, the more clearly to

exhibit the analogy between the two dialects, those secondary forms alluded to, and which have thrown considerable weight on the result of the comparison, have been introduced into the Bengali column.

It is necessary, however, to observe that in romanizing Asamese and other languages hereafter treated of, the vowels are used in accordance with their classical pronunciation on the continent of Europe; and where these are not sufficient to express the vowel sounds in use, diacritical marks have been introduced to supply the deficiency. The fundamental vowel sounds are as follows :

A	sounded as in agreeable, or u in but.
á	„ far.
e	„ men.
é	„ they.
i	„ pin.
í	„ pique.
o	„ not.
ó	„ note.
u	„ pull.
ú	„ rule.
ü	„ French u, or German ü

The consonants are used as in English. G is always hard. H, used after another consonant, shows that it is aspirated; thus, kh is sounded as in pack-horse; th, as in pot-house, &c.; ng, is sounded as in singing. N (with the dash under it) as in infant (French).

In the expression of diphthongs, it is necessary to combine the vowels in such a manner that they shall express the same sounds when united as they do when separate.

*Comparative List of Words.*

<i>English.</i>	<i>Bengali.</i>	<i>Asamese.</i>
Air.	Báyu, Bát, Bátásh.	Botah.
Ant.	Pipiliká, Pinpará.	Poruá.
Arrow.	Tir, Shár.	Káñr.
Bird.	Pakhi, Chiriyá.	Charái.
Blood.	Rakta, Tej.	Tej.
Boat.	Nouká, Ná.	Ná.
Bone.	Asti, Hár.	Hár.
Buffalo.	Mohish.	Moh.
Cat.	Birál, Myáo, <i>a cat's mew</i> whence, myáokári, <i>the mew-</i> er, and thence.	Mekuri.

<i>English.</i>	<i>Bengali.</i>	<i>Asamese.</i>
Cow.	Goru.	Goru.
Crow.	Kák, Káuri.	Káuri.
Day.	Dín.	Dín.
Dog.	Kukur.	Kukur.
Ear.	Karna, Kán.	Kán.
Earth.	Mritiká, Máti.	Máti.
Egg.	Dimbha, Dim.	Koni, Dim.
Elephant.	Hasti, Háti.	Háti.
Eye.	Chókhya, Chók.	Sók.
Father.	Pitá, Báp.	Bápu.
Fire.	Agni.	Jui.
Fish.	Matshya, Mách.	Más.
Flower.	Pushpa, Ful.	Ful.
Foot.	Charan, Pad.	Bhóri.
Goat.	Chágal.	Ságal.
Hair.	Kesh, Chul.	Sul.
Hand.	Hát.	Hát.
Head.	Mastak, Múr.	Mur.
Hog.	Shukar, Baráh.	Gáhorí, Baráh.
Horn.	Shringa, Sing.	Hing.
Horse.	Ashwa, Ghorá.	Ghorá.
House.	Griha, Ghar.	Ghar.
Iron.	Lowha, Lohá.	Loh.
Leaf.	Patra, Pátá.	Pát.
Light.	Dipti, Pohor.	Pohor.
Man.	Purush, Mánush.	Mánuh.
Monkey.	Bánor, Bándor.	Bándor.
Moon.	Chundra.	Jun.
Mother.	Mátá.	Ái.
Mountain.	Parbbat.	Parbbat.
Mouth.	Mukh.	Mukh.
Musquito.	Moshá.	Moh.
Name.	Nám.	Nám.
Night.	Rátri, Ráti.	Ráti.
Oil.	Tóil, Tel.	Tel.
Plantain.	Kalá.	Kolá.



English.	Bengali.	Asamese.
River.	Nadi, Nai.	Nói.
Road.	Pat, Bát.	Bát.
Salt.	Laban, Lón.	Lón.
Skin.	Charmma, Chhál.	Sál.
Sky.	Ákash.	Ákáh.
Snake.	Sarpa, Sáp.	Háp.
Star.	Tará.	Tará.
Stone.	Prastar, Shilá, Sil.	Hil.
Sun.	Súrjya, (Belá, time.)	Beli.
Tiger.	Bágh.	Bágh.
Tooth.	Danta Dánt	Dánt.
Tree.	Brikhya, Gách.	Gach.
Village.	Grám, Gán.	Gán.
Water.	Jal, Páni.	Páni.
Yam.	Álu.	Álu.

The *written characters*, in use among the Asamese, are the same as those that obtain in Bengal, with one or two slight variation. The *powers* of the letters are also the same, except the substitution of S in Asamese for the Bengali Ch, and a guttural H for the Bengali S and Sh.

The *principles of Grammar*, are alike in both the languages. Both have the same rules for the inflections which words generally undergo in order to describe various actions and circumstances, though there exists some diversity in the inflections themselves.

The analogy by which nouns feminine are regularly formed from nouns masculine, is the same in both languages. Thus both have,

*Masc.* Harin, a deer. *Fem.* Harini.

*Masc.* Kukur, a dog. *Fem.* Kukuri.

As in Bengali, so also in Asamese, the names of some of the most common male and female objects in nature, are applied quite absolutely, and without any relation to one another. It must however be observed that the Asamese, far more often than the Bengalis, distinguish the sex of animals by prefixing the terms Matá and Máiki, *male* and *female*.

The seven *Cases* stated to belong to Bengali nouns, are the same in number and order with those of Asamese nouns, but the terminations by which they are discriminated are somewhat different, as shown in the following paradigms.

*Kukur a Dog.*

BENGALI.	SINGULAR.	ASAMESE
<i>Nominative.</i> Kukur.	<i>A dog.</i>	Kukur.
<i>Accusative.</i> Kukurke.		Kukurak.
<i>Instrumental.</i> Kukurte.	<i>By or with a dog.</i>	Kukurere.
<i>Dative.</i> Kukurere.	<i>To a dog.</i>	Kukuraloï.
<i>Ablative.</i> { Kukurete or Ku- kurhoite.	<i>From a dog.</i>	Kukurarpara.
<i>Genitive.</i> Kukurer.	<i>A dog's.</i>	Kukurar.
<i>Locative.</i> { Kukure or Kuku- rete.	<i>In a dog.</i>	Kukurat.
	<i>Plural.</i>	
<i>Nom.</i> Kukurera.		Kukurhat or Kukurbilák.
<i>Acc.</i> Kukurerdigake.		Kukurhatak or bilákak, &c.
<i>Inst.</i> Kukurerdigete.	<i>By or with dogs.</i>	Kukurhatere.
<i>Dat.</i> Kukurerdigere.	<i>To dogs.</i>	Kukurhataloi.
<i>Abl.</i> Kukurerdighoite.	<i>From dogs.</i>	Kukurhatarpará.
<i>Gen.</i> Kukurerder.	<i>dog's.</i>	Kukurhatar.
<i>Loc.</i> Kukurerdigete.	<i>In dogs.</i>	Kukurhatat.

The *Comparison of Adjectives* in Asamese is effected by a similar process to what may be termed the secondary form in current use in Bengal, that is, by prefixing áru *more*, to the Positive, to form the Comparative, and atí, *very*, to form the Superlative.

The Bengalis have two kinds of *Personal Pronouns*. The one used to express superiority or honor, the other inferiority or contempt. We find this degrading consequence of aristocracy in the Asamese pronouns also, but only in those of the 2nd and 3rd persons.

*Bengali.**Asamese.*

1st Person Honorific, Nom. Ámi.

Acc. Ámake, &c.

Nom. Moi.

Inferior, Nom. Mui.

Acc. Mok, &c.

Acc. Moke, &c.

2nd Person Honorific, Nom. Tumi.

Nom. Tumi.

Acc. Tomáke, &c.

Acc. Tomák, &c.

Inferior, Nom. Tui.

Nom. Toi.

Acc. Toke, &c.

Acc. Tok, &c.

3rd Person Honorific, Nom. Tini.

Nom. Tenó.

Acc. Tánháke, &c.

Acc. Tenók, &c.

Inferior, Nom. Tihá.

Nom. Hi.

Acc. Táháke, &c.

Acc. Táak, &c.

The oblique cases of pronouns, in both languages, are formed exactly as those of nouns.

The inflections of Asamese *Verbs*, and the difference between them and those of Bengali verbs, will be best indicated by the following comparative scheme of their verbal terminations.

*Kara, Do.*

INDICATIVE MOOD.

Present Indefinite.

<i>Bengali.</i>		<i>Asamese.</i>	
Honorific.	Inferior.	Honorific.	Inferior.
1. Kari.	Kari.	1. Karon.	_____
2. Kara. <i>do.</i>	Karis.	2. Kará. <i>do.</i>	Kara. _____
3. Karen.	Kare.	3. Kare.	_____

PRESENT DEFINITE.

1. Karitechhi.	Karitechhi.	1. Karison.	_____
2. Karitechha. <i>doing.</i>	Karitechhis.	2. Karisá. <i>doing.</i>	Karisa. _____
3. Karitechhen. <i>doing.</i>	Karitechhe.	3. Karise.	_____

AORIST.

1. Karitám.	Karitám.	1. Karilonhenten.	_____
2. Karitá. <i>did or would do.</i>	Karitis.	2. Kariláhenten. <i>did or would do.</i>	Karilihenten. _____
3. Kariten.	Karita.	3. Karilehenten.	_____

IMPERFECT,

1. Karilám.	Karilám.	1. Karilon.	_____
2. Karilá. <i>did.</i>	Karili.	2. Karilá. <i>did.</i>	Karili. _____
3. Karilen.	Karila.	3. Karile, or karil.	_____

PRETER IMPERFECT.

1. Karitechilám.	Karitechilám.	1. Karisílon.	_____
2. Karitechilá. <i>was doing.</i>	Karitechili.	2. Karisílá. <i>was doing.</i>	Karisili. _____
3. Karitechilen.	Karitechila.	3. Karisile.	_____

PERFECT TENSE.

1. Kariáchi.	Kariáchi.	1. Karison.	_____
2. Kariácha. <i>have done.</i>	Kariáchis.	2. Karisá. <i>have done.</i>	Karisa. _____
3. Kariáchen.	Kariáche.	3. Karise.	_____

PRETER PLUPERFECT.

1. Kariáchilám.	Kariáchilám.	1. Karisilon.	_____
2. Kariáchilá. <i>had done.</i>	Kariáchili.	2. Karisilá. <i>had done.</i>	Karisili. _____
3. Kariáchilen.	Kariáchila.	3. Karisile.	_____

FUTURE.

1. Karibo, or karimu.	Karibo.	1. Karim.	_____
2. Karibá. <i>will do.</i>	Karibi.	2. Karibá. <i>will do.</i>	Karibi. _____
3. Kariben.	Karibe.	3. Kariba.	_____

## IMPERATIVE MOOD.

1. Kari.	Kari.	1. Karon.	_____
2. Kara, or kario.	Kar, or karis.	2. Kará.	Kar.
3. Karun.	Karuk.	3. Karok.	_____

## PARTICIPLES.

<i>Present.</i> Karite, <i>doing.</i>	Karibaloi, or kará, <i>doing.</i>
<i>Past.</i> Krita, <i>done.</i>	Krita, <i>done.</i>
<i>Continuative.</i> Karite Karite, <i>continuing to do.</i>	Karonte karonte, <i>continuing to do.</i>
<i>Adverbial,</i> Kariyá, kari, karile, <i>on doing or being done.</i>	Kari, karilat, karile, <i>on doing or being done.</i>

## GERUNDS.

Karite, <i>for the purpose of doing.</i>	Karibaloi.
Karibá, <i>doing.</i>	Kariba.
Karibár, <i>of doing.</i>	Karibar.
Karibáre, <i>in doing.</i>	Karát.

The rules for syntactical construction are the same in both languages. In the ordinary colloquial use of the Asamese, deviations from the strict rules of syntax are very frequent, but not more so than in that form of Bengali prevalent among the lower classes in various parts of Bengal. I refer particularly to the vague and indiscriminate use of the two classes of idioms, termed by philologists, the *analogous*, and the *transpositive*.

The following specimens of Bengali and Asamese composition, have been furnished to illustrate our remarks on the analogy between the two dialects :—

ENGLISH.—“*Influenced by no fear, he offered outrage on others, seized their property by force, gave false evidence to secure advantage and benefit to himself, and committed various other enormous crimes.*”

This sentence, in the more dignified Bengali style, would be rendered—

“Se sarbbatóbhábē nirbhay haiyá parer daurátmyamátra kare, balete paradrabyápaharan kare, mithyásákhyā diyá swalábh swarakhyá kare ebang ár ár náná prakár mahápátak kare.”

In common Bengali it would run thus :

“Se kichhui bhay ná kariyá parer prati daurátmya kare, bal kariyá parer drabya káriyá lay, mithyá sákhyā diyá ápanár lábh o ápanár rakhyá kare, ebang ár ár náná prakár mahápáp kare.”



In Asamese :

“ Hi eku bhai ne khái parar uporat dushtáli kare, balere parar bostu kárri loy, misá hákhi diyá ápunár lábh áru ápunár rakhyá kare áru ár árharah páp kare.”

*The Lord's Prayer in Bengali.*

“ He ámarðer swargastha pitah, tomár nám pújya hauk ; tomár rájatwa hauk ; ár tomar ichchhá swargete jeman, temani prithibíteo saphal hauk. Ámarðer prayójaníya áhár adya deo. Ár ámrá jeman ápan aparádhidigake khyamá kari, tadrup tumio ámarðer aparádh khyamá karo. Ebang ámarðigake paríkhyáte ánió ná ; kintu manda haite rakhyá kara. Rájattwa o gaurab o parákram e sakali sadákále tomár. Ámen.”

*The Lord's Prayer in Asamese.*

He ámar swargat thoká pitri, tomár nám pújya hauk ; tomár ráijya hauk ; ár jene swargat tene kui prithibít o tomár isshá púr hauk. Áji ámar khábar beháni ámak díá. Áru jenekui ámar dhóruáhontok ámi hohun, tenekui ámar dhár erá. Áru ámak paríkhyáloi ni nibá, kintu ápadar pará ámak rakhyá kará. Rájatto, áru mahiná, áru prabháo ei kakaló hadái tomár. Ámen.

All the other languages that will now come under consideration, may be divided into TWO GREAT CLASSES ; those connected with the Thibetan, and those deriving their origin from the Tai or Shyan stock.

They all nevertheless approximate toward the Chinese colloquial system, and more or less possess the characteristics of being originally *monosyllabic*, and all *intonated*. Those arranged under the second class are also *destitute of inflections*.

The origin of the intonations common to these languages, may in all probability be found in the extremely limited nature of their colloquial medium, occasioned by their confining themselves wholly to a monosyllabic system. The number of their monosyllables must naturally be very limited. On a new object being presented to the mind, it becomes necessary to give it a name ;—the possibility of uniting two or more syllables to form a word never occurred to them, they must therefore have recourse to a monosyllable already in use, and their ingenuity exercised to invent a method of diversifying these monosyllables. This is done by adding to it, *force*, *length*, or *rapidity of pronunciation*.

These intonations, depending as they do only on a modified action of those parts of the larynx, which most immediately affect the voice,

are, in general, exceedingly difficult for a European practically to distinguish. On a careful examination, however it will be found that these tones do not in reality exceed *four*, and that they are the same as those described by Chinese philologists.

The *first* of these, may be said to be pronounced naturally, as a middle tone, even and moderate, neither raised nor deepened by any peculiar effort.

The *second*, is a strong, rough, and vehement sound, produced by strongly exciting the action of the glottis in emitting it.

The *third* tone, is formed by raising the action of the glottis as in forming the second tone, and then somewhat relaxing it, which, while it lengthens the sound makes it end rather feebly.

The *fourth* tone may be characterized as a short, thick, hasty sound, which seems to re-enter the throat, so as at length to be stopped in it. To distinguish this peculiarity, so very common to these languages, it is proposed to place a dot under the final letter.

The prevalence of these intonations, in all the languages spoken by the tribes bordering on the valley of Asam, leaves us at no loss to trace the source from which they have sprung. They evidently bear affinity to the Chinese, however much they may have subsequently been affected by any foreign mixture.

In languages, where those terminations and inflections which render so copious the grammars of the Greek and Sanskrit are almost unknown, there can be little room for grammatical disquisition. Of the two parts which form the basis of philology, it is evident that the inflections and terminations of any particular language furnish the materials for its *peculiar* grammar; hence, where these are wanting there can be left us little beside a few ideas that relate to *general* grammar.

Principles of grammar must necessarily be inherent in every language. But the various rules to which words are subject in order to describe various actions and circumstances, as they constitute the peculiar grammar of any language, can seldom be transferred from the grammar of one nation to that of another. Hence if a language have no inflection to express case, gender or number in its nouns, or mood, tense, and person in its verbs, the language would only be distorted by an attempt to throw its grammar precisely into the form of Latin or Greek grammars for instance, which have inflections for all the more important

parts of speech. The writer's object on the present occasion, has therefore been, to show how people, who make use of none, or but few of these inflections, make their language subserve the same purposes to them, which languages abounding with inflections accomplish for other nations, and this, if fully done, he trusts will lay open the peculiar grammar of each language sufficient for all purposes of investigation.

In attempting to do this, however, with the languages selected for examination, a difficulty meets us at the very onset.

In a cultivated language there generally exists a certain fixed mode of expression, used in standard works of literature, which may be considered as the standard of style,—deviations from which must be sensibly perceived, and regarded as uncouth and improper. Where such works exist, examples taken from them amply suffice for exemplifying the various peculiarities of grammar; but the following remarks can be deduced from no such solid principles. In languages so rude as to have never been reduced to writing, our examples of grammar must be drawn from conversation, often incorrect, and always fluctuating. Add to this, the speakers themselves are so ignorant of the theoretical construction of their own language that they are unable to give the enquirer the least information respecting its grammatical principles. The only plan left the writer therefore, was to collate a number of words and sentences arbitrarily, and then by patiently comparing these sentences together to deduce from them the system on which they are founded.

## PART I.

Having offered these preliminary remarks, we proceed now to the consideration of the BHOTIA LANGUAGE, more commonly designated

### THE THIBETAN.

A copious and elaborate grammar of this language has been already laid before the public by M. Alexander Csoma De Kőrös, and to that work, the student must be referred for a clear exposition of all its peculiarities. Our remarks therefore will be very concise, touching only on those points on which information may be requisite to aid in instituting a comparison between this language and the dialects spoken by the adjoining tribes.

Facts seem to indicate, that there was a time when all the countries west and south of China, up to the very borders of Bengal, used the

Chinese colloquial medium. In after ages however, some great and important event—probably the introduction and spread of Buddhism, —seems to have carried the Sanskrit alphabetic system into these countries, and to have caused its adoption in those nearest to Bengal, with such alterations however, as were necessary to accommodate it to the colloquial medium already current in them. This we find to be the case with Bhotan, where the colloquial medium, which, for ought we know, may have been prevalent in the country from time immemorial, refuses to be identified with the Sanskrit alphabetic system, and has such firm hold on the country, as to induce the inhabitants while they receive the Sanskrit alphabet, to reject some of the letters wholly, and change the sound of others which they still retain.

The literature of Bhotan, having for a long period of time, been connected with that of India, if not entirely derived from it,\* it cannot be expected that the language continues to be a purely monosyllabic one. It may perhaps be better represented as a connecting link between the polysyllabic and monosyllabic languages.

The alphabet is derived from the Nágri or Sanskrit system, and some of the letters resemble the corresponding ones in the Bengali alphabet. It contains eight series, the last of which has only two powers. The first four of these are the K, T, Ch, and P series, common to both the Sanskrit and Chinese system; but the alphabet is alike destitute of the F series of the Chinese system, and of the double modification of the T series, found in the Sanskrit system. The fifth series of this alphabet, Tz, Tzh, &c. is evidently the Ts, Ts'h series of the Chinese system; and amidst the sixth and seventh, vestiges of the other sibilant series may be traced.

But the most singular feature in this descendant of the Sanskrit system is, that the four first series, instead of possessing five letters, like the Nágri alphabet, have only *four*, the second aspirate in each series is wanting, as it is in the Chinese system too, the first and third letters of each series have pretty nearly the same sound affixed to them.

#### OF NOUNS.

*Gender*, in nouns, is usually expressed by the addition of the word pó, *male*, or mó, *female*, before or after the noun. Example :

\* If coeval with the introduction of Buddhism, it must have been between the 7th and 8th centuries of the Christian era.



Khyi, *a dog*, masc. Pó-khyi. Fem. Mó-khyi.

Phág, *a hog*, masc. Phág-pó. Fem. Phág-mó.

These words are also frequently employed as emphatic particles denoting a person or thing especially, or in an eminent degree. E. g. Mí, *a man*, Mí-pó, *the man*. Má, *a mother*, Má-mó, *the mother*.

In the *Declension* of nouns, the same form is adopted as that in Sanskrit, and its derivatives, that is, the addition of certain post-positive particles.

The following is the general form of declension, according to which adjectives, pronouns, and participles, as well as nouns, may be declined.

#### *Terminations.*

Nominative, and Accusative,

Genitive,	kyí, gyí, gí, yí, or í.
Dative,	lá,
Ablative,	lá, or ná.
Instrumental,	kyí, gyí, gí, or í.
Locative,	lá, ná, hu, du, ru, or su.

The plural signs in general use are, nám, dág, chág, signifying *all* : to these the above particles are added as in the singular number.

N. B. If the word end in dh, b or s, the genitive must be formed by kyí ; e. g. Khyodh, *you* ; Khyood-kyí, *your* ; gyáb, *side* ; gyáb-kyí, *of a side*. Yás, *the right* ; yás-kyí, *of the right*.

If the word terminate in gh, or ng, the genitive must end in gí ; e. g. Káng, *a foot*, Káng-gí, *of a foot*.

If the word terminate in a vowel the genitive is to be expressed by í, or yí ; e. g. Má, *a mother* ; má-í, *of a mother*, chu, *water* ; chuyí, *of water*.

If the word terminate in n, m, r, l, the genitive case must be expressed by gyí ; e. g. Shár, *the east*, Shár-gyí, *of the east*, &c.

If the word terminate in gh, or p, the locative case must be expressed by tu.

If the word end in ng, d, n, m, r, l, the locative case must be expressed by du ; e. g. Mur-du, *in haste*. Sóng-du, *in a vessel*.

Chyim, *a House*, is thus declined.

#### *Singular.*

#### *Plural.*

Nom. Chyim, <i>a house</i> .	Chyim-nám, <i>houses</i> .
Gen. Chyim-gyi, <i>of a house</i> .	Chyim-nám-gyi, <i>of houses</i> .
Dat. Chyim-lá, <i>to a house</i> .	Chyim-nám-lá, <i>to houses</i> .

Abl. Chyim-lá, *from a house.*Chyim-nám-lá, *from houses.*Acc. Chyim, *house.*Chyim-nám, *houses.*Instr. Chyim-gyi, *with or by a house.*Chyim-nám-gyi, *with or by houses.*Loc. Chyim-du, or Chyim-lá, *in a house.*Chyim-nám-due, or Chyim-nám-la, *in houses.*

## OF ADJECTIVES.

Adjectives generally stand after the nouns they serve to qualify ; as in Mi ngám, *a bad man* ; Kháng záng, *a good house*. Lung nág, *a black valley*. They are sometimes used before the noun, but in the latter case have the definite particle in the genitive form annexed ; as in Záng mi, *a good man*, or Záng poi mi.

When an adjective is used substantively, so as to denote the abstract quality, it takes after it the particle, Nying. Thus, Nág, *black*, Nág-po, *the black* ; Nág-po-nying, *blackness*. Slá, *easy*, or Slá-po ; and Slá-pó-nying, *easiness*.

Adjectives are formed from substantives by the addition of the genitive sign. Shing, *wood* ; Shing-gi, *wooden*. Ser, *gold* ; Ser-gyi, *golden*. Mi, *man* ; Miyi, *human*.

Negative adjectives are formed by the addition of med, má, mi, midá, mi-máng, yá, &c. Thus, Nor, *wealth* ; Nor-med, *destitute of wealth*. Thá-yá, *without end*. Tshul-med, *irregular*. Mi-rung-po, *inconvenient*. Má-min-po, *unripe*.

Comparison is expressed by prefixing the words je, *more*, and ráb, *most*, to the adjective ; as tho, *high* ; je-tho, *higher* ; ráb-tho, *highest*. More commonly however, the terms lá, pá, or bá, signifying *than* or *more than*, are put after the name of the person or thing to which comparison is made ; Ngá-pá-khyód-che, *Those art greater than I*. Di-lá-de-zang, *That is better than this*. The superlative, or a comparison with totality, is expressed by thám-chád-lá, or kun-lá, *than all*. De kun-lá che-o, or thám chád-lá che-o ; *that is greater than all, or that is the greatest*.

The numeral system, of the Bhotias, consisting of decades, is exceedingly simple. The cardinal numbers are as follows :—

1. Chi.

4. Zi.

2. Nyi.

5. Ngá.

3. Sum.

6. Tu.

7. Dün.	32. So-nyi, &c.
8. Gyed.	40. Zi-chu.
9. Gu.	41. Ze-chi, &c.
10. Chu, or Chu-tám-pá.	50. Ngá-chu.
11. Chu-chi.	60. Tu-chu.
12. Chu-nyi, &c.	70. Dün-chu.
20. Nyi-chu, ( <i>two tens.</i> )	80. Gye-chu.
21. Nyer-chi.	90. Gu-chu.
22. Nyer-nyi, &c.	100. Khyá.
30. Sum-chu.	1000. Tóng.
31. So-chi.	

The unit following the decade in regular order.

There are no ordinals.

The numerals, when put in conjunction with a noun, require that the noun, (which is always put before it) be in the singular number; as, *mi chu, ten men. Lo khyá, a hundred years.*

#### OF PRONOUNS.

The Bhotias, like the Chinese, have a variety of terms to express the PERSONAL PRONOUNS.

There are no less than six to represent the *first person*. These are :

Ngá, and Dág,	in common use.
Khópó,	masculine.
Khó-mó,	feminine.
Nged,	the honorific.
and Ráng,	used emphatically.

The terms used to denote the *second person*, are Khyod, which is commonly used, and Khyed, expressive of civility.

The pronouns of the *third person*, are Khó, most commonly used for both the masculine and feminine.

Kho-pá,	masculine.
Kho-má,	feminine.
Khong, used respectfully.	
Khong-pá, Ditto.	masculine.
Khong-má, Ditto.	feminine.

They are all declined according to the scheme given above for the declension of nouns.

The personal pronouns in the genitive case, are used as POSSESSIVE PRONOUNS.

The DEMONSTRATIVE PRONOUNS are, Di, the proximate, and De, the remote.

The INTERROGATIVES are, Su, *Who?* Gá, *which?* and Chi *what?*

#### OF VERBS.

A word, in Bhotia, expresses an idea, without reference originally to any part of speech ; its grammatical structure being determined wholly by the connection in which it stands. With reference to the Verbs, it may also be remarked, that it is in general, the connection in which they stand which determines them as being active or passive, neuter or causal. There are, however, certain words, which are constantly used as auxiliaries, and which therefore assist in forming the various parts of the verb with which they are conjoined.

Verbs admit of no terminations expressive of persons or number, these points being generally denoted by the context.

Not unfrequently, what in English is termed the SUBSTANTIVE VERB, is expressed in Bhotia by the reduplication of the final letter of a word, with the addition of the vowel o. *Examples* : Sum, *three* ; Sum-mó, *there are three*.

Shing, *wood* ; Shing-gó, *it is wood*.

Nág, *black* ; Nág-gó, *it is black*.

Mád, *true* ; Mád-dó, *it is true*.

Verbs which denote an action affecting others, may from their signification be termed ACTIVE VERBS. And those that simply denote an action, without requiring an object, may be termed NEUTER.

The PASSIVE voice is formed by constructing the verb with another denoting *to do*, or *to make*. The phrase, "*thou art beaten by me*," would be thus expressed, Ngás khyód dung-pár chyed-do, literally, "*thou by me a beating done*."

CAUSAL VERBS are formed by the addition of the verb Jug-pár (*to put, to cause, to make*). Thus ; Bri, *write* ; Bri-jug-pár, *cause to write*.

Bhotia verbs have nothing in them analogous to conjugation, as exemplified in Greek and Sanscrit verbs. Yet as the various modes of expressing the same action, and distinctions of time, are essential to language in general, we shall endeavor to show how they are denoted in this language.



The Indicative Mood requires no explanation. As it merely indicates or declares a thing, it is necessarily the verb in its simplest state.

The *Present Indefinite*. Gró, or Gró-wá, sometimes pronounced Dó, or Dówá, *I go, thou goest, &c.*

Jyed, or Jyed-wá, *I do, thou doest, &c.*

The particle wá, here used, is properly speaking an emphatic particle.

The *Present Definite*, is expressed by the reduplication of the final letter, as already noted.

Ngá dó-ó *I am going*. Khó dó-ó, *he is going*.

Ngá jyed-dó, *I am doing*. Khyod jyed-dó, *thou art doing*.

The *Imperfect* is formed by the addition of the verb Dug-pá, signifying *to sit, to exist*.

Ngá dó-dug-pá, *I was doing*.

Khó jyed-dug-pá, *He was doing*.

The *Perfect tense* is formed by the addition of the word Sóng, signifying *a departing or passing away*. Dó-sóng, *went*.—Nga jye-song, *I did or have done*.

With reference to the first example, it may be remarked that Sóng, by itself, is more frequently used instead of the form above given, as the perfect tense of the verb *to go*; dó-sóng, being now obsolete, but commonly used as a verbal noun, signifying *gait, or the manner of going*.

The *Pluperfect* tense is expressed in the following different forms. Ngá song-wá-yin, or, Ngá song-dug-pá, *I had gone*.

The auxiliary Yin, has the same signification as Dug, *to be, to exist*.

Ngá jye-dug-pá, or, Ngá jye-pá-yin-pa, *I had done*.

The *Future tense*. Ngá dó-pár-jyeur, *I shall go*.

Ngá jye-pár-jyeur, *I shall do*.

Here, dó-pár, and jye-pár, are the gerunds, signifying *to go, and to do*; and the auxiliary jyeur, signifies, *a growing, a becoming*.

#### PARTICIPLES.

*Present*. Dó, or Dópá, *going*. Jye, or Jye-pá, *doing*.

*Past*. Sóng-pa, *gone*. Jye-dug-pá, *done*,

#### GERUND.

Dó-pár, *to go, for the purpose of going*.

Jye-pár, *to do, for the purpose of doing*.

The Imperative Mood. As in English, the only instance in which this mood really exists is in the *second person*. In commanding and entreating it is obvious, that we address only the second person, the first, and the third persons of the verb in this mood, being formed by an address to the second; hence the simple verb is used in the second person, and another verb signifying *let, permit, &c.* is introduced in the first and third persons. This double mode of forming the imperative is found in the Bhotia also. *Exam.* Dó, *go*, Jye, *do*. Ngáh, *laugh*, &c.

In the first and third persons, the verb Zi, *to permit*, is introduced; thus, Dó-zi, *let me*, or *let him go*. Jye-zi, *let me*, or *let him do*. Ngáh-zi, *let him laugh*.

The Potential Mood, which both in English and Latin, includes a great variety of ideas, may in Bhotia be expressed by words signifying power or capacity, duty or obligation, doubt or uncertainty.

In the structure of sentences, nouns in general precede their attributes, and the verbs stand at the end of the sentence, having their qualifying adverbs placed immediately before them.

A few of the Bhotia *particles*, in common use, are here subjoined.

#### ADVERBS.

Nám. <i>When?</i>	Dáng. <i>Yesterday.</i>
Gáng-tshe and Gáng-du. <i>At what time.</i>	Sáng. <i>To-morrow.</i>
Di-du. <i>At this time.</i>	Náng-mo-lá. <i>In the morning.</i>
De-tshe. <i>At that time.</i>	Nu-mo-lá. <i>In the evening.</i>
Nám-yáng. <i>Never.</i>	Rim-gyi. <i>Gradually.</i>
Deng, or Ding, or Deng-tshe. <i>Now.</i>	Ring-pár. <i>Speedily.</i>
Dá-Dálá. <i>This instant.</i>	Gu-le. <i>Slowly.</i>
De-ring. <i>To-day.</i>	Khá-rog-de. <i>Silently.</i>

#### CONJUNCTIONS.

Dáng. <i>And.</i>
Chyáng, Yáng. <i>Also, although, notwithstanding.</i>
Yáng-ná. <i>Or, else.</i>
Uente. <i>If.</i>

Interrogative signs, expressive of doubt, may be formed of any word, by reduplicating its final letter and adding *m* to it; as in, Ngáám Kho, *whether I or he*.

The PREPOSITIONS of occidental languages, are rendered in Bhotia

by post-positive particles. They generally follow the noun in the genitive case.

Ngi chir-du, *for me.*

Kháng-pi náng-du, *into the house.*

Sái hogtu, *under the earth.*

Ri-i gyib-ná, *behind the hill.*

#### SENTENCES.

The following sentences are given as specimens of composition, with the hope that they will afford some insight into the grammatical structure of the language, while they exemplify the rules and explanations above given.

Khyod thóm lá sǒng. *Go to the market.*

Yángchar nget tshói chhír de khyer shóg.

*Bring me some rice.*

Ngá tǒgpá chhe war yodh. *I am very hungry.*

Dhetái ngochítá yodh? *What is the price of that?*

Chítá zhi khyod lóng wá yin? *How much do you want?*

Dóm kháchhe. *Open the trunk.*

Ngye tágzpá khye lá jyú chi yodh. *I will see what you have.*

Chí lábchhá yodh? *What do you say?*

Chí nye ki cháru tshó. *Come along with me.*

Chui phárol dhúdo. *Go across the river.*

Dewar ngá lá máthóbh. *I have not got it yet.*

Nám Khyodh leb yong tshe, dene ngá doweí dǎng. *When you come back then I shall go.*

Zháre zháre tshóg. *Come daily.* Ngá kyede má thong. *I have not seen him.*

Chichir khyod ngye tsár yong? *Why have you come to me?*

Ngá jhitsám khyód thóí nyámdú ne? *How long shall I stay with you?*

Zhág súm ngye dǎng nyám zu shu. *Remain three days with me.*

#### THE CHÁNGLO.

The dialect of the Bhotia, distinguished by the above name, is generally spoken along that portion of the northern frontier of the valley, extending from the Binjee Duwár to the confines of the Kuriápára Duwár, or from about the 91° to the 92° of East Longitude. How far north its colloquial use may be extended we have not the means of

accurately ascertaining; nor are we capable of forming a correct estimate of the probable number of the people by whom it is used.

The inhabitants of this tract of country, occupying as they do the lesser elevations of the Cis-Himalayan range, are generally speaking, agricultural. Their physical appearance exhibits a few shades of distinction noticeable between them and the tribes of the Sub-Himalayas. They are smaller, less muscular, and the hue of their skin possesses a deeper isabelline tint, from which latter circumstance probably they derive their appellation, the term Chánglo, signifying *black*.

The alphabetic symbols used by the Chánglos are identically the same as those used by the Bhotias. There is also a very close similarity in the idiom and genius of the two languages.

#### OF NOUNS.

Nouns have two *numbers*. There is no distinct termination expressive of the Plural: this number is generally formed by the addition of the adjectives *nám*, and *thámche*, signifying *all*, to which the signs of the cases are added in declension as in the singular number.

*Cases* are formed by the following particles used as affixes.

Nominative.	} —————
Accusative.	
Genitive,	i, or yi, or gá.
Dative,	gá.
Ablative,	gái.
Instrumental,	gyi.
Locative,	náng.

According to the above scheme, the noun *Phái*, a house, may be thus declined:—

<i>Singular.</i>	<i>Plural.</i>
Nom. <i>Phái</i> , a house.	Nom. <i>Phái thamche</i> , houses.
Gen. <i>Pháiyi</i> , of a house.	Gen. <i>Phái thamche yi</i> , of houses.
Dat. <i>Pháigá</i> , to a house.	Dat. <i>Phái thamche gá</i> , to houses.
Abl. <i>Phái-gái</i> , from a house.	Abl. <i>Phái thamche gái</i> , from houses.
Acc. <i>Phái</i> , house.	Acc. <i>Phái thamche</i> , houses.
Instr. <i>Phái-gyi</i> , with or by a house.	Instr. <i>Phái thamche gzi</i> , with or by houses.
Loc. <i>Phái náng</i> , in a house.	Loc. <i>Phái thamche náng</i> , in houses.

The genitive sign is almost wholly excluded in common conversation.



This case is expressed merely by the juxta-position of the two substantives; the former, according to general usage in most Indian languages, being understood to form the genitive case; as in Songo pháí, *a man's house*. Kurtá bi, *the horse's leg*.

To mark the distinction of *Gender* the terms phó and mó are generally affixed to the substantives. Thus :

Sáyung, *a deer*. Masc. Sáyungphó, *Fem.* Sáyungmó.

Láng-che, *an elephant*, Masc. Láng-che-phó, *Fem.* Láng-che-mó.

Kurtá, *a horse*, Masc. Kurtá-phó, *Fem.* Kurtá-mó.

To distinguish the male and female of certain animals, the terms lágó or thóngphó, *male*, and dámó, *female*, are sometimes used; as in Khú, *a dog*, Masc. Khú-lágó, *Fem.* Khú-dámó. Rábá, *a goat*, Masc. Rábá-thóngphó, *Fem.* Rábá-dámó.

When it is necessary to mark the distinction of gender emphatically, the adjectives Nyi-án-phó and Nyi-ánp-mó are usually placed after the generic noun.

#### OF ADJECTIVES.

The principle of placing the adjunct after the object *tó* which it is attached causes the adjective generally to follow the substantive; as in Khá-móng bá-lungbó, *white cloth*. Ábá cháng-ló, *a black crow*.

Words originally expressing ideas in their nature substantives, are often used to express the quality they originally denote as existing in another substantive by the addition of the genitive sign. Shing, *wood* : Shing-gá langle, *a wooden plough*.

The general mode of forming *comparison* is that of describing a person or thing as possessing some quality *more than* or *beyond* others. This method requires that the substantive with which the comparison is made be put in the ablative case. *Examples* :—

Ri-gái chángpó, *colder than water*.

Mi-gái sópó, *hotter than fire*.

Jáng-gái iyet pó, *greater than I*.

Changing the noun for the word Thámche, *all*, we have the form of the superlative degree.

Thámche-gái iyetpó, *greater than all*.

Another mode of forming this degree of comparison is by such expressions as *great of the great*, the first word being put in the form of the genitive case. Ex : Iyet-po-gá iyetpo.

Ring-bu-gá ringbu, *long of the long, or the longest*.

## NUMERALS.

The system on which the Chánglo numerals is founded will be best exemplified by the following list :—

- |                                      |   |
|--------------------------------------|---|
| 1. Thúr.                             | 31. Khái-thur dáng song-thur,             |
| 2. Nyik-ching.                       | &c.                                       |
| 3. Sám.                              | 40. Kháinyik-ching, ( <i>two-score.</i> ) |
| 4. Phi.                              | 41. Khái nyik-ching dáng Thur,            |
| 5. Ngá.                              | &c.                                       |
| 6. Khung.                            | 50. Khái nyik-ching dáng se.              |
| 7. Zum.                              | 51. Khái nyik-ching dáng song             |
| 8. Yen.                              | thur, &c.                                 |
| 9. Gú.                               | 60. Khái sám ( <i>three-score.</i> )      |
| 10. Se, which in composition         | 80. Khái phi, ( <i>four-score.</i> )      |
| becomes Song.                        | 100. Khengá.                              |
| 11. Song-thur.                       | 200. Khái-se ( <i>ten-score.</i> )        |
| 12. Song-nyik-ching.                 | 300. Khái-songá.                          |
| 13. Song-sám, &c.                    | 400. Nisu-thur.                           |
| 20. Khái-thur ( <i>one-score.</i> )  | 500. Nisthur dáng khengá.                 |
| 21. Khái-thur dáng-thur, <i>one-</i> | 600. Nisthur dáng kháise.                 |
| <i>score and one.</i>                | 700. Nisthur dáng khái songá.             |
| 22. Khái-thur dang nyik-ching.       | 800. Nisi nik ting.                       |
| 23. Khái-thur dáng sám, &c.          | 900. Nisi nik ting dáng khengá.           |
| 30. Khái-thur dáng se.               | 1000. Nisi nik ting dáng kháise.          |

## OF PRONOUNS.

The PERSONAL PRONOUNS are Jáng, *I*. Nán, *Thou*, and Dán, *He*.

In declension they admit of the same terminations as the nouns.

*Singular.**Plural.*

- |   |   |
|---|---|
| Nom. Jáng, <i>I</i> .                   | Nom. Jáng thámche, <i>We</i> .                  |
| Gen. Jánggá, <i>mine</i> .              | Gen. Jáng thámche gá, <i>ours</i> .             |
| Dat. Jánggá, <i>to me</i> .             | Dat. Jáng thámche gá, <i>to us</i> .            |
| Abl. Jáng gáí, <i>from me</i> .         | Abl. Jáng thámche gáí, <i>from us</i> .         |
| Acc. Jáng or Jänge, <i>me</i> .         | Acc. Jáng thámche, <i>us</i> .                  |
| Instr. Jáng gyi, <i>with or by me</i> . | Instr. Jáng thámche gyi, <i>with or by us</i> . |
| Loc. Jáng náng, <i>in me</i> .          | Loc. Jáng thamche náng, <i>in us</i> .          |

The plurals of the second and third persons are Nán thámche, and Dán thámche.

The DEMONSTRATIVE PRONOUNS are *Thá*, *this*; *Nyá*, *that*; and *Lelá*, used to denote an object *more remote*.

The INTERROGATIVE PRONOUNS, are *Ebuyá*, *who?* *Obáchó*, *which?* and *Háng*, *what?*

#### OF VERBS.

Chánglo verbs admit of no inflections indicative of person or number. The following paradigm will serve to show the forms a verb assumes in its different tenses:—

De, the root of the verb to go.

#### INDICATIVE MOOD.

<i>Present Indefinite.</i>	Jáng Dele, <i>I go.</i> Nán dele, <i>thou goest, &amp;c.</i>
<i>Present Definite,</i>	Jáng Denchá, <i>I am going</i>
<i>Imperfect,</i>	Jáng Denchobá, <i>I was going.</i>
<i>Perfect,</i>	Jáng Debá, <i>I went.</i>
<i>Future,</i>	Jáng Dedong <i>I will go.</i>

#### IMPERATIVE MOOD.

This mood exists only in the second person, and the simple verb is used to express it, as *Nán De*, *go thou*.

The POTENTIAL MOOD is formed by the addition of the word *róbe*, or any other term significant of power, ability, &c. *Jáng Dele ró-be*, *I can go*.

#### PARTICIPLES.

Dele, <i>going.</i>
Dewe, <i>having gone.</i>

#### GERUNDS.

Dewá, <i>to go.</i>
Dene-nádu, or Delenang ká, <i>for the purpose of going.</i>

Interrogation is expressed by the addition of the interrogative particle *mó*. Thus: *Nán Dele mó?* *Do you go?*

The negative particle *má* is usually placed before the verb when negation is implied. Thus: *Má delá*, *I go not*. It is also used in the prohibitive form, *Má de*, *Do not go*.

Some of the Adverbs in common use are—

Omá, <i>now.</i>	Chápten, <i>slowly.</i>
Singye, <i>afterwards.</i>	Iti? <i>when?</i>
Dójó, <i>quickly.</i>	Khinang, <i>to-day.</i>

Námnying, *to-morrow.*Betpe, *in the morning.*Ining, *yesterday.*Nye-ri, *in the evening.*

## SENTENCES.

Thóngsá de, *Go to the market.*Jáng brángxhó khu pháí, *Bring me some rice.*Jángá bínáng khunchá, *I am very hungry.*Khu góng háng yá? *What is the price of rice?*Nán-shi hámtur cháspe yá? *How much do you want?*Dóm phiekchó, *Open the trunk.*Náhá háng chákábá janggye gódong, *I will see what you have.*Ná shiye háng dák chá yá? *What are you saying?*Jánggá Kábni ódó, *Come along with me.*Ri lenggó lokko de, *Go across the river.*Jáng ómábu má nyóng bá, *I have not got it yet.*Nán omchá unye jáng bo dedong, *When you come again I shall go.*Ngámre ngámre ódó, *Come every day (daily.)*Jáng dánye máthong chá, *I have not seen him.*Nánjá reptá hángá upháí yá? *Why have you come to me?*Jáng ne kápni hámtur chole yá? *How long shall I remain with you?*Jáng kápni bínáng sám chye, *Continue with me three days.*Nán omchá kornye óphá jinggye loyikpe, *When you return I shall converse with you.*

## THE GA'RO.

The Gáros occupy that triangular extent of mountainous country between the left bank of the Brahmaputra and the Khassia Hills. From its apex to its base, this triangle lies between the 25° and the 26° of N. latitude, and the base itself extends from the 90° to the 91° of E. longitude.

The Gáros have no traditionary legends whatever that may serve to enlighten us on the subject of their origin. Their remote situation, and their physical appearance, together with their modes and customs, so diverse from those of the Bhotias, would at first militate against the supposition that they were in any way connected with the Cis-Himalayan tribes. This connection however is now made apparent from the strong affinity existing between the language of the Gáros and the several dialects spoken by those tribes. Though these present several modifications, they may nevertheless be traced to the same radi-



cals, so as to prove that an essential affinity existed in their primitive structure, thus affording historical evidence of such a nature as it is impossible for either accident or design to have falsified.

The Gáros make use of no written characters ; and if they at any prior period had adopted the alphabetic symbols of the Bhotias, it is highly probable that their subsequent removal from all contact with them, together with all the hardships to which an emigrating tribe must naturally be subjected, have obliterated all traces of it.

#### OF NOUNS.

Gáro nouns have two *numbers*. The Plural is formed by the addition of the word ráng, signifying *all*. To this form, in declension, the signs of the cases are affixed as in the singular number.

The following are the affixes used in the formation of *Cases* :—

Nominative,———.

Genitive, ní.

Dative, ná.

Ablative, níkhó.

Accusative, khó.

Instrumental, chí.

Locative, ó.

According to the above scheme, the noun Nók, *a house*, may be thus declined :—

<i>Singular.</i>	<i>Plural.</i>
Nom. Nók, <i>a house</i> .	Nom. Nók-ráng, <i>houses</i> .
Gen. Nókni, <i>of a house</i> .	Gen. Nók-rángní, <i>of houses</i> .
Dat. Nókna, <i>to a house</i> .	Dat. Nók-rángná, <i>to houses</i> .
Abl. Nók níkhó, <i>from a house</i> .	Abl. Nók-ráng-níkhó, <i>from houses</i> .
Acc. Nók khó, <i>house</i> .	Acc. Nók-ráng-khó, <i>houses</i> .
Instr. Nók-chi, <i>with or by a house</i> .	Instr. Nók-ráng-chi, <i>with or by houses</i> .
Loc. Nókó, <i>in a house</i> .	Loc. Nók-rángó, <i>in houses</i> .

*Gender.* In this language, as in most others, the names of the most common male and female objects in nature, are applied absolutely and without any relation to one another.

#### Examples.

<i>Masculine.</i>	<i>Feminine.</i>
Mánde, <i>a man</i> .	Mechik, <i>a woman</i> .
Ádá, <i>elder brother</i> .	Ábí, <i>elder sister</i> .
Nónó, <i>younger brother</i> .	Áno, <i>younger sister</i> .
Áphá, <i>father</i> .	Ámá, <i>mother</i> .

The adjectives Bíphá and Bímá, *male* and *female*, are commonly added to the nouns that stand for animals. Thus: Áchak, *a dog*. Masc.: Áchak biphá. Fem.: Áchak bímá. Máchak, *a deer*. Masc.: Máchak bíphá. Fem.: Máchak bímá. Denbó, *a cat*. Masc.: Denbó biphá. Fem.: Denbó bímá.

#### OF ADJECTIVES.

Adjectives always follow the nouns they serve to qualify. As Bithe manná, *a ripe fruit*, Mándé námá, *a good man*.

When a substantive is used adjectively to express a quality as existing in another noun, it is put in the genitive case. Thus: Mándení ják, *the human hand*, or literally *the hand of man*. Ambal, *wood*, Ambalní ketháli, *a wooden knife*.

Adjectives do not admit of comparison by any regular inflections; the comparative degree is expressed by the dative case of the noun, and the addition of a word signifying *than*, *beyond*, &c. Thus, Rówá, *long*. Iná báte rówá, *longer than this*. Delá, *great*. Ángná báte delá, *greater than I*. In the superlative degree the comparison is made with the word Ráng or Dáráng, *all*, and the word báte, *than*, is placed after the adjective. Thus, Dáráng-ná del báte, *greater than all*, (greatest,) Dáráng-ná (rowá-báte) robáte, *longer than all*, (longest.)

When an adjective is used in composition with a noun the signs of the cases are usually affixed to the adjective. Thus:

Nom.	Mándé námjá, <i>a bad man</i> .
Gen.	Mándé námjá-ni, <i>of a bad man</i> .
Dat.	Mándé námjá-ná, <i>to a bad man</i> , &c.

#### NUMERALS.

The numeral system of the Gáros is emphatically decimal, and extends only so far as to admit of the enumeration of the fingers and toes.

1. Shá.	11. Chi-shá.
2. Gini.	12. Chi-gini.
3. Githam.	13. Chi-githam.
4. Bri.	14. Chi-bri.
5. Bongá.	15. Chi-bongá.
6. Dok.	16. Chi-dok.
7. Sni.	17. Chi-sni.
8. Chet.	18. Chi-chet.
9. Shkú.	19. Chi-shkú.
10. Skang.	20. Chi-skang.

A peculiarity in the use of the above numerals is here worthy of notice.

When applied to *men*, the particle *Shák*, is always prefixed ; thus : Mánde shák skang, *ten men*. Ángná nóno shák-bri dongá, *I have five brothers*. And when the individuals of a group or company are reckoned up the computation proceeds thus : Shák-shá, Shák-gini, Shák-githam, or Shák-tham, Shák-bri, &c.

When the numerals are applied to individuals of the brute creation, they are preceded by the particle *Máng* ; thus : Máchu máng-dok, *six cows*. Dóo máng-githam chkángáhá, *we carried off three fowls*.

When enumerating inanimate objects the particle *Ge* is always prefixed to the numerals, thus : Ám ge-gini, *two mats*. Meng-go-ni jáa ge-bri, *a cat has four legs*.

#### OF PRONOUNS.

The PERSONAL PRONOUNS are Ángá, *I* ; Ná-á, *Thou* ; and U'á, *he* ; with their plurals Chingá, *we* ; Násimong, *you* ; and U'á-mádáng, *they*. No distinction is made on account of gender. They are declined like nouns.

##### 1st Person.

<i>Singular.</i>	<i>Plural.</i>
Nom. Ángá, <i>I</i> .	Nom. Chingá, <i>we</i> .
Gen. Ángni, <i>mine</i> .	Gen. Chingní, <i>ours</i> .
Dat. Ángná, <i>to me</i> .	Dat. Ching-ná, <i>to us</i> .
Abl. Ángnikho, <i>from me</i> .	Abl. Ching-níkho, <i>from us</i> .
Acc. Áng-kho, <i>me</i> .	Acc. Ching-kho, <i>us</i> .
Instr. Áng-chi, <i>by me</i> .	Instr. Ching-chí, <i>by us</i> .
Loc. Áng-o, <i>in me</i> .	Loc. Ching-o, <i>in us</i> .

##### 2nd Person.

<i>Singular.</i>	<i>Plural.</i>
Nom. Náá, <i>thou</i> .	Násimong, <i>you</i> .
Gen. Nángni, <i>thine</i> .	Nángsimongni <i>yours</i> .
Dat. Náng-ná, <i>to thee</i> .	Násimongná, <i>to you</i> .
Abl. Náng-nikho, <i>from thee</i> .	Násimongnikho, <i>from you</i> .
Acc. Náng-kho, <i>thee</i> .	Násimongkho, <i>you</i> .
Instr. Náng-chi, <i>by thee</i> .	Násimongchi, <i>by you</i> .
Loc. Náng-o, <i>in thee</i> .	Násimongo, <i>in you</i> .

## 3rd Person.

*Singular.**Plural.*

Nom. Uá, <i>he.</i>	Uámádáng, <i>they.</i>
Gen. Uáni, <i>his.</i>	Uámádángni, <i>theirs.</i>
Dat. Uáná, or Uná, <i>to him.</i>	Uámádángná, <i>to them.</i>
Abl. Nánikho, <i>from him.</i>	Uámádángkho, <i>from them.</i>
Acc. Uá-kho, <i>him.</i>	Uámádáng-kho, <i>them.</i>
Instr. Uá-chi, <i>by him.</i>	Uámádáng-chi, <i>by them.</i>
Loc. Uáo or Uáno, <i>in him.</i>	Uámádángo, <i>in them.</i>

The DEMONSTRATIVE PRONOUNS are, Iá, *this*, and O'á, *that*; with their plurals Iáráng, *these*, and O'áráng, *those*.

The INTERROGATIVE PRONOUNS are Shá, *who*? Bádiá, *which*? and Máí, *what*?

These are all declined like the Personal Pronouns.

## OF VERBS.

The Substantive verb, *to be*, is, in Gáro, usually expressed by the reduplication of the final letter of a word. Thus: from námá, *good*, we have Námáá, *it is good*. Nok, *a house*, Nokká, *it is a house*. The verb Dong, *to be, to exist*, is often used with the same signification. Thus: Wál dongá, *it is fire*.

The verb To Go, may be thus conjugated:—

## INDICATIVE MOOD.

<i>Present Indefinite.</i>	Iáng-ná, <i>I go, thou goest, he goes, &amp;c.</i> [This is also the form of the Gerund, signifying <i>to go</i> , or <i>for the purpose of going</i> .]
<i>Present Definite.</i>	Iáng-engá, <i>I am going, &amp;c.</i>
<i>Imperfect.</i>	Iáng-engá-chím, <i>I was going, &amp;c.</i>
<i>Perfect.</i>	Iáng-áá or Jáng-á, <i>I went, &amp;c.</i>
<i>Perfect Definite.</i>	Iángá-chím, <i>I have gone, &amp;c.</i>
<i>Future proximate,</i>	Inesá, <i>I will go, &amp;c.</i>
<i>Future remote,</i>	Iángkhing, <i>I will go, &amp;c.</i> [This form also denotes termination.]

## PARTICIPLES.

<i>Present,</i>	Iánge, <i>going.</i>
<i>Continuative,</i>	Iángo iángo, <i>going or continuing to go.</i>
<i>Past,</i>	Iáng imong, <i>having gone.</i>



## IMPERATIVE MOOD.

The only instance in which this mood really exists is in the 2nd person, *Iáng-bó, go thou.*

The Potential mood includes a variety of ideas which may be expressed by words signifying ability, duty, &c.

*Iágná mánná* or *Iágná mán* *khen ná, may or can go.*

*Iágná mankhe chim, might have gone.*

## SUBJUNCTIVE MOOD.

*Iángóde, If I go.*

The verb in the Passive Voice is conjugated in the same manner as the preceding, with the addition of the word *mán*, introduced between the verb and its inflection.

## INDICATIVE.

<i>Present Indefinite,</i>	<i>Iáng-mán-na, I am gone.</i>
<i>Present Definite,</i>	<i>Iáng-mán-engá, being gone.</i>
<i>Imperfect,</i>	<i>Iáng-mán-engáchim, was being gone.</i>
<i>Perfect,</i>	<i>Iáng-mán-áá, was gone.</i>
<i>Perfect Definite,</i>	<i>Iángá-man-chim, have been gone.</i>
<i>Future proximate,</i>	<i>I-mán esá, will be gone.</i>
<i>Future remote.</i>	<i>Iáng-man-kheng, will be gone.</i>

And so on through the other moods and tenses.

*Negation* is implied by the use of the word *já*, after the verb in its various tenses.

*Ángá iáng, I do not go.*

*Uá thóle ágán-ja, he tells no lies.*

The same word is added to adjectives to express a negative quality. Thus : *Námá, good ; Námja, bad.*

The *prohibitory form* is expressed by prefixing the particle *dá*, to the verb with which it is used. Thus : *Dá Iáng, go not.*

*Khimi-náni dá shál, do not pull her tail.*

The *interrogative* particle *má* is usually placed after the verb or at the end of a sentence in which a question is asked. *Náá uná khenná má? Are you afraid of him? Ná dáálo nokná inేశá má? Will you go home to day?*

The general mode of arranging words into sentences is the same as that which prevails in the Bhotia ; nouns precede their attributes and

the verb stands at the end of the sentence, having its qualifying adverb placed immediately before it. This mode, however, is not always attended to in the Gáro and its cognate dialects, in which we often find sentences follow no other order in their construction than what the taste or fancy of the composer may suggest: sometimes making the object, sometimes the action, and sometimes the modification of the action to precede or follow the other parts. The confusion which this might be supposed to occasion is avoided by the manner of inflecting their words, by which they are made to refer to the others with which they ought to be connected, in whatever part of the sentence they occur, the mind being left at liberty to connect the several parts with one another after the whole sentence is concluded.

## ADVERBS.

Báshko, *when?*

Báshikcháng, *how many times?*

Báchi, *where?*

Iáno, *here.*

Uáno, *there.*

Áphálo or Áphálchi, *outside.*

Níng-chi, *inside.*

Dáóng, *now.*

Báshko-báshkobá, *sometimes.*

Shálántini, or Sháldráng, *always.*

Pák-pák, *quickly.*

Kásn-kásn, *slowly.*

Wáló-sáló, *day and night.*

Príngó, *in the morning.*

Áthámó, *in the evening.*

Máiná, *why.*

Námá, *well.*

Indin, *so.*

Tháljá, *truly.*

Báshik, *how many?*

Báshishák, *ditto*, applied to men.

Báshikmáng, *ditto*, applied to inferior animals.

Post-positive particles, in this language supply the place of the prepositions in occidental tongues. They generally follow the noun in the Genitive case, though the sign of the genitive is often omitted.

Makhá, *with*, Ángni makhá rebó, *Come with me.*

Nung, *in*, Uá nok nung dongá, *He is in the house.*

Koshák, *upon*, Ádung chángrowá koshák, *upon the high hill.*

Sipáng, *near*, Wál sipáng dá iáng, *Go not near the fire.*

Skáng, *before*, Ángni skáng-skáng iángbó, *Go before me.*

Jámáng, *after*, Uáni jámáng jámáng ibábo, *Come after him.*

# SENTENCES.

Báoná inesá? *Where (are you going, or) will you go?*

Makhá wákheng, *It will rain.*

Áng makhá rebo, *Come with me.*

Mánde-bisá-ráng róá, *The boys play.*

Máchá mánde chká, *The tiger kills men.*

Náá uná khen jámá? *Are you not afraid of him?*

Menggó móshe chká, *The cat kills mice.*

Uáló nikhá, *She sees in the dark.*

Jákskhil máttá, *Her claws are sharp.*

Khimi dáshál, *do not pull her tail.*

Khimi shálode, khuákheng, *If you pull her tail, she will scratch you.*

Náthok námmákho nibo, *Look at this fine fish.*

Ángá uá nathokho balsisi mánná, *I caught this fish with a hook.*

Chi dongjáde, shi kheng, *If it have not water, it will die.*

Khimi dókshá tengá, *It shakes its tail.*

Uá shi khu já, *It is not dead.*

Mánde chio thángjá, *Men do not live in the water.*

Matte mángshá sháán, *There is but one God.*

Uá thánga mámung óbá shijá, *He lives for ever.*

Áá shilgi dákká, *He made the earth and the heavens.*

Áng kho, náng kho, dáráng kho gámmá, *He made me and you and all things.*

Ból githing, áchu dállá, chi bimá, shál, já, doshák düpil jáshkhi, iárángkhobá mätte dákká, *The green tree, the high mountain, the great water, the sun, the moon, the twinkling stars, God made all these.*

Mánde sáksáni degapá sakni. Dephánte songópá uni phágápá kho  
*One man (had) two sons. The younger son to his father*

ágána. E Áphá! ángná gám mattám ónbó. Unphágápá  
*said, O Father! to me a share of the wealth give. His father*

gámkhó shuále onnáá. Uni já mánó dephánte  
*the wealth dividing gave (it to him.) A few days after the*

songópá átháng gámkhó áimang sangche láchi iángá ;  
*younger son his own wealth taking to a far country went ;*

wó sangó átháng nám jáimang átháng gámkhó gomáitá.  
*in that country he in doing wickedly his wealth spent.*

Nkhemo uni gám gammá thó kete uá sangó ákál ongáá,  
*Afterwards his wealth having spent in that country a dearth was,*

uá bán bara dukh ongáá. Unkhoá unisangóni mánde sháksá  
*his great distress was. Then of that country one man*

chánádongá ungkhémang uni nók shephángona iángá. Uá mánde  
*being rich there to his house he went. That man*

uákhó wák nerikná anná, wákná cháná ónáko uá  
*him pigs to keep gave, to the pigs the food (that was) given he*

cháná dakká, uná dárángbá cháná ónjá. Nkhémung átháng  
*wished to eat, to him no one gave to eat. After shut his own*

gishkho ráimang ágáná, hái ! hái ! áng phágopáni nokó  
*mind being distressed he said, alas ! in my father's house*

sákar mánde mánná dongá, unóde ángábá cháná mankhechim.  
*servants are many, there I also to eat might have.*

Ángá ioni iángkheng ápháni nokoná.  
*I hence will go to my father's house.*

#### THE KÁCHÁRI.

The Kácháris, or (as they term themselves) Bórrós, are a numerous race, found in almost all parts of the valley of Asam, but principally along its northern and southern boundaries. Chatgari, a frontier district, situated between Desh Durrung and the Bhotan hills, seems to be their principal *local* ; and here their numbers are said to amount to about 30,000, which is about half the Káchári population in the valley.

Destitute of any written characters, they have no historical records of any kind from which to deduce proofs of their origin ; and their traditional legends throw but a faint light on the subject. An examination into their language however furnishes abundant proof of their intimate connection with the tribes of the Cis-Himalayas. A large proportion of their vocables are identical with those of the Gáros, and almost all the rest may be traced to some dialect of the Thibetan, while the idiom



of the language and the peculiarities of its grammar show abundant traces of descent from a common origin.

Closely connected with the Kácháris, among the inhabitants of the plains, are the Hojái Kácháris, the Kochis, (including the Modai Kochis, the Phulguriyas, and Hermias,) the Mechis, the Dhimals, and the Rabhas.

It is not our purpose at present to say anything of these dialects, between which and the Káchári the differences are rather nominal than real, but our remarks will have reference only to the peculiarities of the Káchári language.

#### OF NOUNS.

Nouns have two *numbers*. The plural is generally formed by the addition of the word *phúr*, to which, in declension, the signs of the cases are added as in the singular number.

*Cases* are formed by the use of the following post-positive particles, which except in the Dative case are added to nouns in the genitive form.

Nominative,	_____.
Genitive,	ni.
Dative,	no, há.
Ablative,	phrái.
Accusative,	khó.
Instrumental,	jang.
Locative,	áo-há.

In accordance with the above scheme, the noun *Mánse*, *a man*, may be thus declined :

#### *Singular.*

Nom.	Mánse, <i>a man</i> .
Gen.	Mánseni, <i>of a man</i> .
Dat.	Mánsenó, <i>to a man</i> .
Abl.	Mánseni phrái, <i>from a man</i> .
Acc.	Mánse khó, or Mánseni khó, <i>man</i> .
Instr.	Mánsenijang, <i>by a man</i> .
Loc.	Mánseni áo, or Mánsenihá, <i>in a man</i> .

#### *Plural.*

Nom.	Mánse-phur, <i>men</i> .
Gen.	Mánse-phurni, <i>of men</i> .
Dat.	Mánse-phur nó, <i>to men</i> .
Abl.	Mánse-phur ni phrái, <i>from men</i> .
Acc.	Mánse-phur khó, <i>men</i> .
Instr.	Mánse-phur ni jang, <i>by men</i> .
Loc.	Mánse-phurni áo, <i>in men</i> .

*Gender.* The most common nouns have distinct terms to denote the distinction of sex. Thus :

*Masculine.**Feminine.*Mánse, *man.*Hinjáó, *woman.*Bisái, *husband.*Bihí, *wife.*Aphá, *father.*Ái, *mother.*Biphá, *father.*Bimá, *mother.*Ádá, *elder brother.*Bái, *elder sister.*Phong báí, *younger brother.*Binánáo, *younger sister.*Mánse góthó, *man-child (boy.)*Hinjáó góthó, *woman-child (girl.)*

The words, *Jeu*, and *Jelá*, which are equivalent to the terms *male* and *female*, are commonly added to the nouns that stand for animals. There are exceptions however to this rule, the terms *Bóndá* and *Bóndi*, *Phántá* and *Phánti*, *Pherá* and *Pheri*, are in certain cases substituted for the usual sexual postfixes.

*Masculine.**Feminine.**A Dog*, Cheimá-jelá.

Cheimá-jeu.

*A Tiger*, Mosá-jelá.

Mosá-jeu.

*A Cat*, Máuji-bóndá.

Máuji-bóndi.

*A Deer*, Khutiámoi-phántá.

Khutiámoi-phánti.

*A Goat*, Búrmá-phántá.

Búrmá-phánti.

*A Buffalo*, Moichü-pherá.

Moichü-pheri.

## OF ADJECTIVES.

In *Káchári*, the qualifying adjuncts are placed as often before as after the substantives ; thus : Mánse gáhám, *a good man.* Hámmá góthó, *a naughty boy.* Hinjáósá laji ganang, *a modest maid.* Hángsi guphut, *a white goose.*

Adjectives expressing an abstract quality are formed by the addition of the word *Ganang*, *having, possessing.* Thus : Khnáí, *hair* ; Khnáí ganang, *hairy.*

Rang, *colour* ; Rang ganang, *coloured.*Hágrá, *a forest* ; Hágrá ganang, *woody.*

Negative adjectives are formed by the addition of *Geyá*, *empty.* Thus :

Rang, *colour* ; Rang-geyá, *colourless.*Bide, *juice* ; Bide-geyá, *juiceless.*Tháká, *wealth, money* ; Tháká-geyá, *poor, penniless.*Hí, *cloth* ; Hí-geyá, *naked.*

*Comparison.*—Adjectives admit of no inflections expressive of the degrees of comparison. A person or thing is therefore described as possessing some quality beyond another, or more than all; and for this purpose the word Chin, *than*, is added to the adjective, and the substantive with which the comparison is made is put in the genitive case. Instead of the sign of the genitive case, the euphonic particle Bó is sometimes used. Thus, Gedet, *great*. Bini gedet chin, or Binbó gedet chin, *greater than this*.

Bóinó, *all*. Bóini gedet chin, or Bóinóbó gedet chin, *greater than all*.

Grá, *hard*. Bini grá chin, *harder than this*. Sarni grá chin, *harder than iron*. Bóini, or Bóinóbo grá chin, *hardest of all*.

#### NUMERALS.

The following is the cardinal series of numbers extending only to 10. When it is necessary to reckon beyond this number, the Kácháris adopt the numeral system of the Bengalis.

1. Che.	6. Ró.
2. Nái, or Gni.	7. Sni.
3. Thám.	8. Ját.
4. Bre.	9. Chku.
5. Bá.	10. Jí.

When applied to *human beings*, the particle Sá, is prefixed to the numerals, when applied to *other animals*, Má; to *inanimate objects*, Thái; to trees, &c. Pháng: to *articles enumerated by pieces*, Gáng. With the addition of these prefixes, the numeral may either precede or follow the noun. Ex. Mánse sánái, *two men*. Burmá mábre, *four goats*. Phitái tháiró, *six fruits*, &c.

#### OF PRONOUNS.

The *Personal pronouns* are Áng, *I*; Nang, *thou*; and Bi, *he*; with their plurals Jang, or Jang-phur, *we*; Nangsur, *ye*; and Bisur, *they*. No distinction is made on account of gender. They are declined like the nouns.

#### 1st Person.

<i>Singular.</i>		<i>Plural.</i>	
Nom.	Áng, <i>I</i> .	Nom.	Jang, or Jangphur, <i>we</i> .
Gen.	Ángni, <i>mine</i> .	Gen.	Jangni, <i>ours</i> .
Dat.	Ángnó, or Ángnihá, <i>to me</i> .	Dat.	Jangnó, <i>to us</i> .
Abl.	Ángniphraí, <i>from me</i> .	Abl.	Jangniphraí, <i>from us</i> .
Acc.	Ángkhó, <i>me</i> .	Acc.	Jangkhó, <i>us</i> .

Inst. Ang jang, *by me.*Loc. Angniáo, *in me.*Inst. Jang jang, *by us.*Loc. Jangniáo, *in us.*

## 2nd Person.

*Singular.*Nom. Nang, *thou.*Gen. Nangni, *thine.*Dat. Nangnó, *to thee.*Abl. Nangniphrái, *from thee.*Acc. Nang khó, *thee.*Inst. Nang jang, *by thee.*Loc. Nangniáo, *in thee.**Plural.*Nom. Nangsur, *ye.*Gen. Nangsurni, *yours.*Dat. Nangsurnó, *to you.*Abl. Nangsurniphrái, *from you.*Acc. Nangsur khó, *you.*Inst. Nangsurnijang, *by you.*Loc. Nangsur niáo, *in you.*

## 3rd Person.

*Singular.*Nom. Bi, *he, she, it.*Gen. Bini, *his.*Dat. Binó, *to him.*Abl. Biniphrái, *from him.*Acc. Bikhó, or Binikhó, *him.*Inst. Binijang, *by him.*Loc. Biniáo, *in him.**Plural.*Nom. Bisur, *they.*Gen. Bisurni, *theirs.*Dat. Bisurnó, *to them.*Abl. Bisurniphrái, *from them.*Acc. Bisurkhó, or Bisurnikhó,  
*them.*Inst. Bisurnijang, *by them.*Loc. Bisurniáo, *in them.*

The DEMONSTRATIVE PRONOUNS are Beye, *this*; and Bóyu, *that*; with these plurals, Beyphur, *these*; and Bóyphur, *those*.

The INTERROGATIVE PRONOUNS, are Shur, *who*? Bóbe, *which*? and Má, *what*?

They are all declined like the personal pronouns.

## OF VERBS.

The Substantive verb, *To be*, appears to be wholly wanting in Ká-chári; its place is often supplied by the verb Dang, *exist*. Thus: Dũi dang, *it is water*.

All verbs may be conjugated after the form of the following paradigm.

## INDICATIVE MOOD.

*Present.* Já-dang, *am eating*. Tháng-dang, *am going*. Máu-dang, *am doing*.

Here the verb Dang, *exist*, is added to the root of the verb as an auxiliary.



*Imperfect.* Já-bái, or Já-nái, *ate*. Tháng-bái, or Tháng-nái, *went*.

Máu-bái, or Máu-nái, *did*.

*Perfect.* Já-dangman, *have eaten*. Tháng-dangman, *have gone*.

Máu-dangman, *have done*.

*Future, (proximate.)* Já-nise, *will eat*. Tháng-nise, *will go*. Máu-nise, *will do*.

*Future, (remote.)* Já-gan, *will eat*. Tháng-gan, *will go*. Máu-gan, *will do*.

#### PARTICIPLES.

*Present.* Já-dang, *eating*. Tháng-dang, *going*. Máu-dang, *doing*.

*Past.* Jánáne, *having eaten*. Tháng-náne, *having gone*. Máu-náne, *having done*.

*Gerund.* Jáná, *to eat, for the purpose of eating*.

Tháng-ná, *to go, for the purpose of going*.

Máu-ná, *to do, for the purpose of doing*.

The verb Láng, *take away*, is sometimes compounded with another verb, to convey the idea of an action having been done completely, or effectually. Thus. Áng máu-láng-bái, *I have done (it) effectually*. Nang já-láng-bái, *thou hast eaten (it) completely*. Bi tháng-láng-bái, *he has gone away effectually*.

#### IMPERATIVE MOOD.

The only instance in which this mood really exists is in the 2nd person. Here the root of the verb is used. As; Nang já, *eat thou*. Nang tháng, *go thou*. The English form, *let me eat*, &c. is expressed by the addition of the verb Hó, *give*, or Than, *permit*. Thus; Ángno jáná hó, *let me eat*. Ángkho thángná than, *let me go*.

The Subjunctive Mood, is formed as in English, by prefixing the subjunctive particle *if*, Jadi. Thus; Áng jadi jádang, *If I eat*. Jadi nang thánggan, *If thou wilt go*.

#### POTENTIAL MOOD.

*Power or capacity* is usually expressed by Háá, *to be able*, added to the gerund.

Áng thángná-háágan, *I will be able to go, or I can go*.

Bi mauná-háábái, *He was able to do*. And so through all the other tenses.

The use of the word Gaman as an auxiliary, appears to give us a form of a Preterpluperfect tense in this mood? Thus, Áng já-gaman,

*I might, could or would have eaten.* Nang tháŋg-gaman, *Thou mightest have gone.*

*Duty or obligation*, is expressed by the word Náng-gan. Thus : Nang tháŋgná-náng-gan, *You must go.*

The Optative Mood, or the form expressive of *desire*, is denoted by the word Námái used as an auxiliary after the gerund. Thus, Áŋg tháŋgná-námái, *I wish to go.* Bi jáná-námáidang, *He is desiring to eat.*

The Prohibitive form is expressed by Dá, used as a prefix to the verb in the Imperative Mood. Dá tháŋg, *Go not.* Dá já, *Eat not.* Dá máu, *Do not.*

Simple Negation is expressed by the particle Á (changed into Yá after a vowel). Thus. Áŋg thányá, *I do not go.* Bi já-yá, *he does not eat.*

When a question is asked, the interrogative particle Ná is usually added to the verb. Thus : Nang tháŋgna-háágan ná? *Wilt thou be able to go?* This particle is omitted when any other word in the sentence implies an interrogation. Thus : Bi má bidang, *What does he want?* Nang má ráidang, *What art thou saying?*

The Passive voice is usually formed by means of an auxiliary verb, signifying, *to be, to eat, to exist, &c.* added to the root of the primary verb. Thus from Bu, *strike*, and Já, *eat*, we have—

*Present tense.* Áŋg bu já dang, *I am struck.*

*Imperfect.* Áŋg bu jábái, *I was struck.*

*Perfect.* Áŋg bu já dangman, *I have been struck, or I have eaten a beating ; and so on through all the other tenses.*

The general mode of arranging words into sentences is the same as that, that obtains in the Bhotia and Garo, and is common to all trans-positive languages.

A few of the Adverbs and other indeclinable particles in common use, are here subjoined.

Jitiá, *when.*

O'bóla, *then.*

Unáó, *afterwards.*

MDáne, *now.*

O bóla, *when?*

Fhungáó, *in the morning.*

Monáíáó, *in the evening.*

Gában, *to-morrow.*

Miyá, *yesterday.*

Dini, *to-day.*

Máóáh, *where?*

Behá, *here.*

Boihá, *there.*

Gejáná, *afar off.*

Mána, *why?*

Mábre, *how?*

Tháip-chyá, *how many?*

Besebáng, *how much?*

Jesebáng, *as much.*

Usibáng, *so much.*

Erehái, *so, like this.*

Hórehái, *like that.*

Góbáng, *much.*

Thísi, Bángái, *little.*

Thubái, *enough.*

Kintu, *but.*

Áró, *and, also.*

Láse-láse, *slowly.*

Már-már, *quickly.*

U, Nóngó, *yes.*

Geyá, Nóngá, *no.*

#### SENTENCES.

Nangni náwá má?

*What is your name?*

Ángni náwá Pislá.

*My name is Pislá.*

Nang bájará thangnánanggan.

*You must go to the Bazar.*

Dini sánsemán má máu dangman?

*What have you done all day long?*

Nang jidi mithigo má ni ktá?

*If you know why do you not speak?*

Áng mungbó ktá ke.

*I did not say any thing.*

Nó luna uwá námái.

*Look for bamboos to build a house.*

Hánse jen duá jen gobone dang.

*Keep the ducks and fowls apart.*

Ángni se-gáng-gáu gósóng náne dáthá.

*Do not stand before me.*

Wotni jeng ángni jeng dá gósóng.

*Do not stand between me and the fire.*

Ángni ádá khó lingdangman pháíá kshe.

*I have called my brother but he would not come.*

Bi ktádang gában pháíná námáidang.

*He says he wishes to come to-morrow.*

Gában phungáo pháí.

*Come early to-morrow morning.*

Thángná nábái dang thái, tháng.

*If you wish to go now, go.*

Ang má ktágan bikhuno gunidang.

*I am thinking of what I am to say.*

Sáche mánsehá psárlá sánái dangman. Psárla godái sthángni  
*To a certain man two sons there were. The younger son to his*  
 bipháhá ktábái, Hele Áphá! Thákná chijchárá jidange ángbhágche  
*father said, O father! the goods that will fall*

mangan ángni hó, Sthángni bóstu bisurni ránnánnái hóbái.  
*to my lot give to me. His own goods to them having divided he gave.*

Sánneisur thangnánái, psárlá godái dhón-bóstu lángnánái,  
*A few days having passed, the younger son his substance having taken,*  
 gejánhá dekháo thángbái. Sthángni thákhá erine sephái thórobái. Boibó  
*to a far country went. His wealth uselessly he spent. All*

sephái thórónánnái bi dekháo. Ángkál jábái, Ábólá  
*having squandered in that country a famine was (or ate up). Then*

jánemane hámlángbái. Unáo bi thángnánái bi  
*not having to eat he dried up (starving). Then he having gone in that*  
 dekháo giri nose náó thábái. Bi mánse omá gúmná  
*country in a householder's house remained. The man swine to feed*

dubliáo thúnótbái. Obólá omá jána gunde jang sthángni  
*in the field sent (him). Then for pigs to eat the husks with his own*

ude bunghuná issá já bái, kintu bine ráóbó hóákse. Unáo  
*belly to fill he was desirous, but no one gave (him). Then*

mónáo gugleinána, bi ktábái, Ángni ápháá bándi gólám jábránger  
*in mind being pained, he said, My father's servants are*

dang jána lángna máne dang, bini khiribo jábránger  
*many, to eat enough (they) have, more than that they all have,*

Ángá ikhámukhinána tháidang, áng biniphrái ápháhá

*I for want of food am dying, I hence to (my) father*

tháng-gan.

*will go.*

N. B. These notes had been written before I had had an opportuni-



ty of seeing Mr. Hodgson's "First Essay on the Aborigines of India." On a comparison of his remarks on the grammar of the "Bodo" (Kachari) language with those here submitted, a few discrepancies will be observable, particularly in the conjugation of verbs.

After a careful re-examination of my notes, however, I have seen no reason for introducing any amendments. The want of agreement between us may probably be attributable to local peculiarities.

#### THE MIRI.

The chief seat of the Miris appears to be the low hills north of Banskotta and Lukimpur, from whence the exactions and cruel ravages of their formidable neighbours the Abors, have compelled them to emigrate in large numbers, into the plains of Upper Asam.

The Abors, and Bor-Abors occupy an extensive range of mountainous country, along the southern exposure of the great Himalaya chain extending from the 94° to the 97° of east longitude and bordering, it is said, on Thibet and China.

A partial comparison of the dialects spoken by these tribes furnishes abundant evidence of their original consanguinity; while the coincidence between their vocables and the terms in common use by the Thibetan tribes is frequent and unequivocal.

The Miri, being the only one of these dialects we have had an opportunity of examining, our remarks relating to grammar, will have reference to that dialect only.

#### OF NOUNS.

The *Cases* of nouns, of which there are six, are expressed by the addition of post-positive particles, except in the instance of the accusative, and sometimes of the Genitive case. The noun which stands in this latter relation is often indicated merely by its being placed before the other.

The absence of a *plural* form is usually supplied by the introduction of the words *árang* and *kiding*, signifying *all*, to which in declension the particles are applied as in the singular number.

The following is an example of the declension of a noun.

*Elág, a hand.*

*Singular.*

Nom.	<i>Elág, a hand.</i>
Gen.	<i>Elág, or Elágga, of a hand.</i>
Dat.	<i>Elág-nape, or Elág-kepe, to a hand.</i>

Acc.	Elág, <i>hand</i> .
Abl.	Elág-lókem, or Elág-kem, <i>from a hand</i> .
Instr.	Elág-kóki, <i>with a hand</i> .
Loc.	Elág-ló, <i>in a hand</i> .

Gender is sometimes denoted by distinct words, as :

Ámie, <i>man</i> .	Mimmó, <i>woman</i> .
Koúa, <i>boy</i> .	Mieng, <i>girl</i> .
Bábá, <i>father</i> .	Náná, <i>mother</i> .
Páíá, <i>uncle</i> .	Niáyá, <i>aunt</i> .
Milló, <i>husband</i> .	Mieng, <i>wife</i> .

The male and female of inferior animals are indicated by the terms baka and keka, these terms, however, are added only to the last syllable of the nouns, thus :

Dum-sung, *a deer*. Masc. Sung-baka. Fem. Sung-neka. Menjeg, *a buffaloe*. Masc. Jeg-baka. Fem. Jeg-neka. Sit-te, *an elephant*. Masc. Te-baka. Fem. Te-neka. Saben, *a goat*. Masc. Ben-baka. Fem. Ben-neka. Eki, *a dog*. Masc. Ki-baka. Fem. Ki-neka.

In asking a question to ascertain the gender of these animals, a still further abbreviation is employed. The last syllable of the noun, and the first of the adjective are the only ones used. Thus :

Tene teba? *Is it a male or a female elephant?*

Kine kiba? *Is it a male or a female dog?*

Benne ben ba? *Is it a male or a female goat?*

#### OF ADJECTIVES.

The position of an adjective in a sentence is immediately after the noun it serves to qualify, as : Rók-pi áimá, *a bad egg*. Ámie áidá, *a good man*.

An adjective has no variation of case or number ; but when used in composition with a noun, the variations of case are usually applied to the adjective instead of to the substantive.

Adjectives are compared by adding Ámedág, or Titidág, *very, exceeding*, for the comparative, and Átádág, for the superlative. Thus :—Átág, *broad*. Átág ámedág, *broader*. Átág átádág, *broadest*.

Kámpó, *beautiful*. Kámpó titidág, *more beautiful*, and Kámpó átádág, *most beautiful*.

To give greater force or expression to the comparison the words Ámedág and átádág are sounded with a lengthened utterance of the voice.

The most expressive superlative form is made by prefixing the word *ápuling*, *all*, to the ordinary superlative. *Ápuling kámpó átádág*, *the most beautiful of all*.

## NUMERALS.

The Miri numerals, which apparently were meant only to suffice for the enumeration of the fingers and toes, are as follows :—

- |                       |  |
|-----------------------|--|
| 1. <i>Ákó.</i>        | 11. <i>U-ying-kó-á-kó.</i>               |
| 2. <i>Án-i-kó.</i>    | 12. <i>U-ying-kó-án-i-kó.</i>            |
| 3. <i>Áum-kó.</i>     | 13. <i>U-ying-kó-áum-kó.</i>             |
| 4. <i>Á-pi-kó.</i>    | 14. <i>U-ying-kó-ápi-kó.</i>             |
| 5. <i>Ang-ó-kó.</i>   | 15. <i>U-ying-kó-ang-ó-kó.</i>           |
| 6. <i>Á-keng-kó.</i>  | 16. <i>U-ying-kó-á-king-kó.</i>          |
| 7. <i>Ki-nit-kó.</i>  | 17. <i>U-ying-kó-kinit-kó.</i>           |
| 8. <i>Pí-ni-kó.</i>   | 18. <i>U-ying-kó-pí-ni-kó.</i>           |
| 9. <i>Kó-náng-kó.</i> | 19. <i>U-ying-kó-náng-kó.</i>            |
| 10. <i>U-ying-kó.</i> | 20. <i>U-ying-án-i-kó, or I-ling-kó.</i> |

## OF PRONOUNS.

The *Personal Pronouns* are *Ngó*, *I*, *Nó*, *thou*, and *Bü*, *he*, with their plurals, *Ngólu*, *Nólu*, and *Bülu*. No distinction is made on account of gender.

They admit of the same variations of case as the nouns.

## 1st Person.

	<i>Singular.</i>	<i>Plural.</i>
Nom.	<i>Ngó, I.</i>	<i>Ngólu, or Ngó-lu-ke, We.</i>
Gen.	<i>Ngóg, mine.</i>	<i>Ngólug, ours.</i>
Dat.	<i>Ngóg-kepe, to me.</i>	<i>Ngó-lug-kepe, to us.</i>
Abl.	<i>Ngóg-lókem or Ngóg-kem, from me.</i>	<i>Ngó-lu-kem, or Ngó-lu-lokem, from us.</i>
Acc.	<i>Ngóm, me.</i>	<i>Ngó-lum, us.</i>
Instr.	<i>Ngóg-kóki, with me.</i>	<i>Ngó-lukoki, by or with us.</i>
Loc.	<i>Ngó-ló, in me.</i>	<i>Ngólu-ló, in us.</i>

## 2nd Person.

	<i>Singular.</i>	<i>Plural.</i>
Nom.	<i>Nó, thou.</i>	<i>Nó-lu, you.</i>
Gen.	<i>Nóg, or Nóg-ke, thine.</i>	<i>Nó-lug, yours.</i>
Dat.	<i>Nógke kepe, to thee.</i>	<i>Nó-lug-kepe, to you.</i>
Abl.	<i>Nóg-ke-ló-kem, from thee.</i>	<i>Nó-lug-lokem, or Nó-lukem, from you.</i>

Acc.	Nóm, <i>thee.</i>	Nó-lum, <i>you.</i>
Instr.	Nóg-ke-koki, <i>by thee.</i>	Nólug kóki, <i>by you.</i>
Loc.	Nóg-ló, or Nóló, <i>in thee.</i>	Nó-lu-ló, <i>in you.</i>

## 3rd Person.

	<i>Singular.</i>	<i>Plural.</i>
Nom.	Bü, <i>he.</i>	Bü-lu, <i>they.</i>
Gen.	Büg or Büg-ke, <i>his.</i>	Bü-lug, or Bü lug, <i>theirs.</i>
Dat.	Büg-kepe, <i>to him.</i>	Bü-lug-kepe, <i>to them.</i>
Abl.	Büg-kem, or Büg-lo-kem, <i>from him.</i>	Bü-lu-kem, or Bü-lug-lo-kem, <i>from them.</i>
Acc.	Büm, <i>him.</i>	Bü-lum, <i>them.</i>
Instr.	Büg-kóki, <i>by them.</i>	Bü-lu-ko-ki, <i>by or with them.</i>
Loc.	Büló <i>in them.</i>	Bü-lu-ló, <i>in them.</i>

The Relative pronouns are Sekó, *who*, and Eng-kó-kó, *what*.

Demonstrative pronouns are Siná, *this*; Esiná, *that*; and Ele, the more remote. They are all declined like the Personal Pronouns.

## OF VERBS.

Miri verbs admit of no terminations expressive of number and person.

The following scheme of verbal terminations will serve to show how verbs in general are conjugated.

It may here be remarked that the roots of Miri verbs are generally monosyllabic.

For the purpose of illustration we shall use the verbal roots, Da, *eat*. Gi, *go*. Ká, *see*.

## INDICATIVE MOOD.

*Present Indefinite*, dabang.

Ngó Da-dabang, *I eat.* Ngó Gi-dabang, *I go.*

Ngó Ká-dabang, *I see.*

*Present definite*, ládabang, or lábang.

Ngó Da-lábabang, *I am eating.* Ngó Gi-ládabang, *I am going.*

Ngó Káládabang, *I am seeing.*

*Second Aorist*, Káne.

Ngó Da-káne, *I did eat.* Ngó Gi-káne, *I did go.*

Ngó Ká-káne, *I did see.*

*Imperfect*, Ká-bang.

Ngó Da-kábang, *I ate.* Ngó Gi-kábang, *I went.*

Ngó Ká-kábang, *I saw.*



*Perfect, tabang.*

Ngó Da-tabang, *I have eaten.* Ngó Gi-tabang, *I have gone.* Ngó Ká-tabang, *I have seen.*

*Future, Pabang.*

Ngó Da-pabang, *I will eat.* Ngó Gi-pabang, *I will go.*

Ngó Ká-pabang, *I will see.*

#### IMPERATIVE MOOD.

The only instance in which this mood really exists is in the *Second Person*.

Ká, or Láng-ká.

Nó Da-ká, or Da-lánká, *eat thou.* Nó Gi-ká, or Gi-lánká, *go thou.*

Nó Ká-ká, or Kálánká, *See thou.*

The termination toká, is commonly used as a more expressive form.

Thus : Da-toká, Gi-toká, Ká-toká.

*Gerund, pü.*

Da-pü, *to eat, for the purpose of eating.*

Gi-pü, *to go, for the purpose of going.*

Ká-pü, *to see, for the purpose of seeing.*

*Participle, taláng.*

Da-taláng, *eating.* Gi-taláng, *going.*

Ká-taláng, *seeing.*

*Duty or obligation* is implied by the termination Káng kapü.

Ngó Da-káng kapü, *I must eat.* Nó Gi-káng kapü, *you must go.*

Bü Ká-káng kapü, *he must see.*

*Potential Mood, ládang.*

Da-ládang, *can eat.* Gi-ládang, *can go.* Ká-ládang, *can see.*

Sometimes the verb Meká, *to be able*, is added to the gerund, to express the same signification ; Da-pü meká, Gipü meká, Kápü meká.

*Negation* is expressed by the substitution of máng for the usual termination bang. Thus : Ngó Gi-máng, *I do not go.* Bü Ká-kámáng, *He saw not.* Ngó Dapa-máng, *I will not eat.* Nó Gilá-máng, *you can not go.*

*Prohibition* is denoted by the use of the word iyoká, after the verbal root. Thus : Gi-iyoká ; *Do not go.* Da-iyoká ; *Do not eat.* Lu-iyoká, *Do not speak.*

#### ADVERBS.

O', *yes.*

Má, *no.*

Egiddá, <i>truly.</i>	Inkóló, <i>where ?</i>
Supág, <i>now, immediately.</i>	Só, <i>here.</i>
Lekó, <i>again.</i>	Ūná, <i>there.</i>
Ladipó, <i>always.</i>	Arálo, <i>within.</i>
Siló, <i>to-day.</i>	Luló, <i>without.</i>
Iyámpó, <i>to-morrow.</i>	Anindo, <i>near.</i>
Móiló, <i>yesterday.</i>	Mórdó, <i>far.</i>
Róló, <i>early.</i>	Menápe, <i>quickly.</i>
Róuálo, <i>in the morning.</i>	Dengúm, <i>slowly.</i>
Yummálo, <i>in the evening.</i>	

The idiom of the language is the same as that of the Bhotia, and the same latitude allowed in the structure of sentences as is common to all transpositive languages.

#### SHORT SENTENCES.

- Nóg ámine akan? *What is your name ?*  
 Ngóg ámine Kúmólie, *My name is Kúmóli.*  
 Nóg bába inkóló? *Where is your father ?*  
 Ekum árangesi bábae dang. *Father is in the house.*  
 Ele ámie áidá. *That is a good man.*  
 Sek ene ioksik se? *Whose knife is this ?*  
 Bū gidingki ngo ekiem páke-tabang. *He has killed my dog with a spear.*  
 Áchyálo kupák tóka. *Throw it into the water.*  
 Áchyálo anga dang. *Fish live in the water.*  
 Ede idikó site dang ne? *How many elephants are there there ?*  
 Asáre áirupe sárdág. *The wind blows very hard.*  
 Esi amie akólu dang ne? *What does this man say ?*  
 Ngómápin ádjyókó biláng ká. *Give me a little rice.*  
 Ngogke mángke. *It is not mine.*  
 Asópe dutoká. *Sit quietly.*

For the sake of comparison I have here annexed a brief vocabulary of each of the languages we have had under review. I could wish they had been made more copious, or that I had had some model to act upon whereby they might have been rendered more valuable for ready and effective comparison. Should leisure and opportunity, however, admit of my pursuing the line of research I have now taken up, I hope at some subsequent period to be able to furnish more copious, and I

trust more correlatively useful vocabularies, than those now submitted, including all the dialects spoken on the circuit of the Asam valley.

I take this opportunity of acknowledging my obligations to the Rev. N. Brown, for the list of Abor words here furnished, and to Captain J. T. Gordon, for the list of Kachárá words kindly supplied by him.

English.	Bhotiá.	Chánglo.	Gáro.	Kachárá	A'bor	Miri
Above	Teng	Gátán	Khoshák	Gajó	Tong	Táleng
Air	Lungmá	Ridi	Bál, Bálwá	Bar	Asár	Asár
All	Thámche	Thámche-ráng	Játáng, Dáiráng	Boibo	Aráng	Aráng
Anger	Chigpá	Chigpá. Ró	Khá nángá	Baráp	Már-dung	Márdung
Answer, (verb)			Aggán	Ráidou		Ták-ká
Ant	Jómó	Kháng-jilá	Chi-brim	Angkhá	Meráng	Meráng
Arrow	Dá	Mibrung	Brá	Bálá	Epugh	Epugh
Ashes	Gothé, Théó	Thu lu	Áp-thá	Hátho-pholá	Med bu	Med bu
Ask	Ditáchi	Jimehó	Shung-bó	Sung	Tátóká	Tátóká
Aunt	(Pat.) Anni (mat.)	(Pat.) Anye, (Mat.)	(Pat.) Ámbi, (Mat.)	(Pat.) Ánei (Mat.)	Ánye	Ánye
	Amchum	Azim	Áde	Ádei		
Back, (noun)	Gyap	Gyápá	Jang-gal	Bikhung	Lámku	Lámku
Bad	Zokpó. Dukpó	Má likpó, (lit. <i>not good</i> )	Námjá	Hámma	Mígáng	Áimáng
Beg	Phechi. Jonggá	Pháchlá. Jolong	Jolongá (Asamese)	Jolongá	Egin	Sagan
Bamboo	Páksing	Só	Wá	Unwá	E	Dibáng
Basket	Lákchung	Kherkó	Kherá	Kháda	Gempá	Pási, (Asam.)
Beads	Jiru. Pchem	Juru	Repok	Lü	Lóng-gó	Daksiri
Bear, (n.)	Dom	Omshá	Mapol	Múphúr	Sitúm	Sitúm
Beard	Gicó	Mánggrá. Jáó	Khusmang	Dári (Asam.)		Demtóká
Beat	Dúng	Kungshu	Dagbo	Bu	Dídung	Ketkó
Bed	Giáblá	Kángti	Anbo	Tuli	Ketkó	Táng-úde
Bee	Biyáng	Wagum	Bía	Bere	Táng-úd	Táng-úde
Beg	Lháng	Phunme	Biámbo	Bí	Kórdung	Kotá-ká
Belly	Phóu	Pholáng	Okó	U'dei	Áki	Áki
Betlenut	Gohé	Gohé ( <i>Sansk.</i> )	Gue	Goi	Goiu	Goie
Bird	Chyá. Pjhyá	Khá	Dáo	Dáo	Pettáng	Pettáng

Bite, (v.)	Choáp	Ngám su	Chikbo	At	Kát dung	Gámmotaká
Bitter	Kháp	Khálu	Khá	Gak-khá	Kasange	Kodág. Konám
Black	Nágo	Chánglo	Gishim	Gasam	Yoráng	Yáká
Blood	Thák	Yi	Anchi	Thoi	Yi	Yie [lung)
Boat	Gru. Dhu	Dru	Ring	Náu	Etku	Olang. (Asam Hü-
Body	Júg	Luspá	Be-en	Madam	Amir	Amir
Bone	Ruitó	Kháng	Greng	Begeng	Along	Along
Bow, (n.)	Zhu	Lì	Sri	Jilit	I'	I'e
Boy	Busá	Kotá	Mánde bisá <i>(young man)</i>	(lit. Gotho	Miloko ( <i>youth</i> )	Kona
Brass	Jhángchep	Jháng	Pital	Phit-lei	Pitol	Pitol
Break	Cháadang	Phoicho	Phebo	Bái	Dirdu	Tirsat toká
Bring	Báyo	Phái	Abábo	Lábo	Láto ká	Láto ká
Broad	Bóm	Chilu	Gepeng	Gehen	Étág	Átág
Brother	(Elder)	Phógem, Atá. Boning	Adá. Angjong	Adá. Phong-bái	Ani. A'bing	Ani. Payá
	(younger)	Nóchung				
Buffalo	Máhe	Brung	Mátmá	Moishü	Menjeg	Menjeg
Burn	Metáng	Gokcho	Shobo	Sáu	Rálik gudung	Rálikguká
Bury	Dóngticháp	Wáng-phió	Khope danbó	Phop	Yutoh	Yutoká
Call	Bóchi	Ráyó	Akatbo	Ling	Tomdung	Goktoká
Carry	Básong	Bó-yó	Ráng-bó	Láng.	Bomká	Bomká
Cat	Bjili	Dáni	Mengó	Máuji	Kedári	Mendári
Catch	Jungchli	Chung-shó	Rembó	Ham	Gáktoh	Gákto ká
Cheek	Námchítóá	Naijó. Khur-káng	Nátheng	Khaolái	Mingmo	Mingmo
Child	Waksá	Waksá	Mande Bisá	Bishá	Ko	Ko
Chin	Gám	Rózó	Khud-bó	Khukháp	Asok	Sokdur
Cloth	Zong. Gólag	Zong. Kámong	Bará	Hí	Gásur	Gásur
Cloud	Tin. Sámó	Byang. Mugpó	Mukhá-smá	Jomái	Táling among	Damir
Cold	Gyang. Khyem	Khurjá. Chángpó	Sná	Gujáng	Sikil	Sikil
Come	Shyó	O'áb	Ibábo	Phái	Apólá	Kápe
Cook, (v.)	Chó	Lámshó	Shungbo	Chong	Apin motoká (lit. <i>prepare rice</i> )	Apin motaká
Copper	Jhángmár	Jhang chálu	Támá ( <i>Asam</i> )	Thamá	Tám	Tám
Cow	Bá. Dáng	Wá. Jábá	Máchu	Musho	Sou	Goru ( <i>Asam</i> )
Crooked	Yochedu	Yochedu. Khórá	Gongeyá	Khen khá ( <i>Asam</i> )	Dirdun	Geng kurdág



English.	Bhotiá.	Chánglo.	Gáro.	Kachári.	A'lor.	Miri.
Crow	Abák. Aóla	Abá	Dakhá	Dáokhá	Piyág	Piyág
Cry	Gnu	Gye-phá	Grápó	Gáp	Kábdung	Kábdung
Cut	Tuítáng	Chorbó	Denbó	Dán	Tári	Pá toká
Dance	Chámkyáp	Chámjyongsó	Chrokbó	Masá	Mordung	Páko-sotoká
Dark	Nádung	Mirsuphu	Andála (Asam)	Khmasli	Anún	Rurupdág
Daughter	Búmo	Jámin	Demchick	Phisá	Ome	Anmah
Day	Nyinmo. Nimá	Nám	Sál ( <i>the sun</i> )	Sán	Longe	Longa
Deaf	Renthó	Nágá thál málá	Benggá	Benggá	Rube	Rube-dág
Deep	Tingpó. Dóngring	Ting	Tho-ówá	Gatho	Eri	Ori-dág
Die	Khí	Sí	Sibó	Thei	Sikkai	Si-kang
Dig	Kó. Tókchikó	Üng-bákhó	Chubó	Jáo	Dýdang	Dútoká
Dog	Khyi	Khu	Achá	Seimá	Ekki	Ekkye
Drink	Thung	Jámshó	Ringbó	Lung	Dape	Tipe
Dry	Kámpo	Sáng má	Ráná	Gorán	Sáng dung	Sáng dung
Duck	Dámjá	Gelendi	Dógep	Pátí hángso (Asam)	Pezák	Pezáb
Ear	Námchó	Ná	Náchil	Khamá	Narung	Ierung
Earth	Sá	Sá	Áhá	Há	Among	Among
East	Shiár	Shiár	.....	Sán-já	Sáng-gá	Dai sáng-gá ( <i>sun</i> )
Eat	Zó. Já	Zó. Já	Chábó	Já	Dolá	Dolá
Egg	Gongná. Gongthó	Gotham	Bitchi	Dáo-dei	Rok pi	Rokpi
Elbow	Lábe-chito	Nying jim	Jáks-khu	Khilá	Lák bin	Lák bin
Elephant	Lángchen. Langp- che	Láng pehi	Mongmá	Háti (Asam)	Sitte	Sittá
Eye	Mig. Mittó	Ming	Mukran	Nigan	Áming	Amidá
Face	Dong	Zhuk	Mukháng	Mukháng	Mingmo	Mingmo
Fall	Jásoye	Phutkin	Gá-apbó	Gugulai	Atok dung	Atok-toká
Far	Nye. Tháring	Ringmá	Chelá	Gaján	Mordo	Mordo
Fat	Bóm	Yetpu. Chiló	Delá	Gupphung	Zinámá	Zinámá
Father	Phá. Ápá	Ápá	Aphá	Aphá	Bábá	Bábá
Fear	Dogme	Yong ken	Khenbo	Gi	Pesoe	Poisodá
Feather	Dhó	Khephu	Gráng	Gáng	Amide	Amide
Fight	Chetá	Chetá	Dá-grik-bó	Khunji-lái	Páminsudung	Pamin suká
Finger	Chetung	Brumu	Jáksi	Asi	Lákke	Lákke
Fire	Me	Mi	Wal	Wat	Ene	Ummá

Fish	Gná	Ná-tok	Ná	Engo	Ngá
Flower	Mentok	Bibal	Bibár	Apun	Apun
Foot	Kangpá	Jáá, Jatheng	A'-theng	Aie	Leppa
Forest	Chenáng	Burung	Hágrá	Monám	Yumráng
Forget	Jishoi	Bengbulu	Baogar	Mitpan	Mitpan ká
Frog	Byep	Bithe	Imbu	Tátik	Tátik
Fruit	Domám	Manbo	Phitái	Aie	Aie
Get	Thópchi	Mechik bisá ( <i>wo-man child</i> )	Man	Pádun	Pátoká
Girl	Bumchung	Anbo	Ho	Ome	Ammah
		Iángbo	Tháng	Bi	Bi-toká
Give	Gró, Song	Dabak	Burmá	Gikángku	Gikánka, Gitoká
Go	Rá	Cháijong, Matte	Yshwor ( <i>Asam</i> )	Soben	Soben
Goat	Lámákhén	Soná ( <i>Bengali</i> )	Dorbi	....	Doini tálenge ?
God	Khenchógi	Námá	Gáhám	Angin	[kángdá Ainá
Gold	Sí	Dogep-dalgábá ( <i>a Hángsi great duck</i> )	( <i>a Hángsi</i> )	Kámpo,	Káng-kángdá, Aido
Good	Lezhum, Leppo	Shám	Gángso	Pezák	Káng- Payang
Goose	Angsi	Dellá, Dalgábá	Gedet	Ing	Ing
		Khni	Khái	Bote	Bote
Grass	Chá	Ják	Nákhái	Dumid	Dumid
Great	Bom	Rakká	Grá	Elág	Elág
Hair	Tá, Kyá	Machibo	Magai	Tolnám	Tolnám
Hand	Lágpá	Chá, Man	Man	Kánggeru máng	Kánggeru toká
Hard	Sáddingbe	Uá	Bi	Kádung	Kátoká
Hate	Khámlokpe	Dán	Khoro	Bü	Bü
Have	Ié	Shárang	Khána	Dumpung, Tupko	Tupko, Mito-oko
He	Khó, Khú	Niáncho	Beohah	Tát dung	Tát toká
Head	Gó, Guthio	Iáno	Gajo	So	So
Hear	Nyán	Chángrowá	Há-jo	Kedon	Adág
Here	Thá, Ná	Ádung, Abri	O'má	Adi	Adi
High	Ringbe	Wák	Gong	Eyeg	Eyeg
Hill	Ri, Phu, Lákhá	Grong		Áreng	Áreng ( <i>Deer's</i> ), Jég-
Hog	Phákpá				reng ( <i>Buffaloe's</i> )
Horn	Rajó, Raó				

English.	Bhotiá.	Chánglo.	Gáro.	Kachári.	A'bor.	Miri.
Horse	Tá	Kurtá	Gorei (Asam)	Gorái	Gure	Gore
Hot	Chátum	Chálo. Gumpujá	Ding-gá	Gudung	Igán	Gudorung
House	Chým.Nang.kháng	Phái	Nak	Ná	Ekum	Ekum
Husband	Jáko	Phoibó	Jikse	Bishái	Milo	Milo
I	Ngá	Jáng	Angá	Ang	Ngo	Ngo
Immediately	Dátarang	Omárá	Bák-bák	Gakhrei	Supág	Supág
In	Lá. Nangná	Náng	Ning	Nising	Eráng	Aráng
Iron	Chyá	Per	Shil	Shur	Yogir	Yogir
Ivory	Lángchen cheo	Lángche	Mongmáni wágám	Hátí hátí	Táreng	Táreng
		(elephant's tooth)			(horn)	
Kill	She	Shewá	Dake gálbo	Dángar	Didung	Ditoká
Kiss	Khákhende	Chubává	Khudum	Khudum	Mumpuk	Mumpuk
Knife	Kathálá	Kháchi	Ketháli	Kháthári (Asam)	Áiog.	Áiog. Yoksi
Knee	Púmú	Gumjing	Jásh-khu	Anthu (Asam)	Lebing	Lebing
Know	Syechi	Sewá	Uá	Mithi	Kendung	Ken toká
Laugh	Gáume	Ngárbá	Khádengbo	Mini	Ngildung	Irda toká
Little	Nyungbe	Desur	Anthiti. Chonná	Bángái	Amyedá	Amyedá
Light, (n.)	Dángsángsáng	Ngám	Charáng	Chráng	Puáuge	Puáuge
Lightning	Lányóme	Tánglephá	Ri-phrápá	Dumái	Yári	Yári
Look	Táchi	Gocho	Nibo	Nu	Kárdoh	Kár toká
Long	Ringbu	Ringbu	Rowá	Ga láo	Bordong	Áiárdong
Mad	Khyechu	Nántálá	Phágálá (Beng.)	Báolía (Asam)	Nguádong	Nguádong
Man	Mi	Songó	Mánde	Mánse	Amie	Amie
Many	Leshá	Bothur	Bángá	Jábrá	Alummá	Alummá
Mat	Bálep	Kotholo. Chugir	Am	Em	Epoh	Epoh
Medicine	Men	Mán	Shám	Muli	Dhumá	Dhumá
Milk	Om	Nú	Shok	Gákhir (Asam)	Anú	Aniug
Monkey	Tyu. Pchyá	Jálá	Mákhre	Mokhorá	Sibie	Sibie
Moon	Dáwá	Láni	Já	Nákhabár	Polo	Polo
Mother	Amá. Ái	Amá	Amá. Ái	Ái. Bimá	Náne	Naná
Mouth	Khá	Noáng	Khushuk	Khugá	Népáng	Náppáng
Name	Ming	Ming	Bimung	Náwá	Amin	Amin
Near	Boloká. Nidálu	Iálo. Jábráng	Sepháng	Kháthi	Mong-yo	Anindág
Neck	Kyam	Tongtong	Gitok	Godo	Aling	Liupang

Nest	Tháng	Shium	Bi-thup	Dáo dánh	Asub	Asup
New	Serpá. Sáp	Singmá	Getál	Gadán	Ani	Anidág
Night	Chenmó. Nummó	Bináng	Wálo	Hor	Kámo	Kyem-mo
No	Má. Míngó	Má. Máyang	Já	Nángá	Má	Má
Noise	Kutsó. Kye	Shádere	Jik-jáká	Hái ( <i>Asam</i> )	Agom	Agom
North	Jáng	Gól	....	Sáh	Linggi	Ket pong
Nose	Lhápá	Náwn	Gungthung	Gonthong	Nobung	Nye wung
Now	Dátaráng. Dengtse	O'maráng	Dáno	Dáno	Supág	Supág
Oil	Num. Mákhu	Si. Memsí	Tho	Tháo	Tuláng	Tuláng
Old	Gypó	Gátpu	[Leó Getcham	Borái ( <i>Asam</i> )	Aku	Aku
Open	Shuptáng. Dejá	Phújó.	O'bo	Kheng	Tá toká	Tá toká
Paddy	Re	Bar	Phiekhó. O'bo	Mi gilgi náng ( <i>rice</i> Mai	Am	Am
			<i>with the husk</i> )			
Place, (v.)	Zhá	Thei	Dan bo	Din	Medung	Me-toká
Plant, (v.)	Shingchu	Shingchéo	Gebo	Gái	Letto	Let-toká
Plough, (n.)	Khámí	Lángle	Náng-gri	Náng-gal	Arigmo	Arig mo
Pull	Then	Jángchó	Sháibo	Bo	Sodung	So-toká
Push	Phítáng	Brekjó	Shket bo	Nárho	Medung	Me-toká
Quarrel	Thámongjyapme	Kholong	Shái griko	Náng jolái	Lumindung	Lumintoká
Quickly	Bangyap	Dojonde	Bák búk	Gukhri	Menápe	Menápe
Quietly	Cháude	Supte	Kháshne	Shri shri	Asupe	Asupe
Rain	Chyáp	Námsu	Mokhá	Mokhá	Pedong	Pedong
Raise	Thu	Dungsho	Dethumbo	Dikhang	Zoto ká	Zoto ká
Rat	Bitthi	Piehrubá	Moshe	Injud	Kebung	Kebung
Ratan	Mu	Menji	Re	Ráidáng	Esong	Esong
Rice ( <i>cooked</i> )	Tó	Tó	Mi	Mikhám	Apin	Apin
Rice ( <i>uncooked</i> )	Chum	Khu	Merong	Mairong	Ambin	Ambin
Ripe	Chochrome	Mimpá	Manná	Gomon	Mindung	Mindung
Rise	Lóng	Thimsho	Chákhát bo	Sikhát	Dárepto	Dárepto
River	Chu	Rjukpó	Chi-ring	Daimá	Botte	Abung
Road	Lám	Lám	Rámá	Námá	Lámbe	Lám
Run	Jyukte. Chong	Che-e	Khát bo	Khát	Dup to ká	Duptoká
Salt	Chá	Inchá	Khári ( <i>Asam Pot.</i> Chang khári	ash)	Allo	Allo



English.	Bhotiá.	Chánglo.	Gáro.	Kachári.	A'bor.	Miri.
Sand	Bjim	Bechá	Ancheng	Báli (Asam)	Shie	Sullie
See	Táchi	Gochó	Ni-bo	Nái	Kúndung	Kár toká
Seek	Swichi	Lancho	Am-bo	Nábái	Mátár dung	Mátártoká
Sell	Chongtang	Chungsho	Phál bo	Phál	Kodung	Kotoká
Short	Thungko	Dájá, Thumo	Khánde-ká	Gáháí	Pokom	Ádyá dág
Shut	Chechyí	Chumecho	Chbo	Pháng	Pokom	Pokom toká
Silver	Ngui	Tángká, Ngui	Rupá	Rup	Amel	Amel. Rup
Sing	Lucháp	Ngáng áio	Chering bo	Ruijáp	Pak song	Paksong
Sister	Azhim (elder), Sing-mó (younger)	Ano (eld.), Nány-ing (younger)	Abi (eld.)	Ano Bái (eld.)	Búrne	Atungá
Sit	Deh	Lángsho	Achungbo	Jo	Dulá	Du toká
Skin	Págápá, Kóó	Mungná	Bigil	Bigur	Asig	Asig
Sleep	Nye	Ipácho	Thubo	Thentho	Immi	Immi. Ildo
Slowly	Golebyá	Chápte	Kháshim kháshim	Lásei lásei	Asope	Asope
Small	Chungkó	Dezá	Choná	Mudái	Amiyo	Amiyene
Smoke, (n.)	Dupá	Mugu	Wálkhu	Ukhundi	Miki	Mikye
Snake	Brul, Beu	Buchilá	Chip-o	Jibo	Tábi	Tábbe
Son	Buh	Zhá	De-phánthe	Bishá, Psájla	O'	Áue
Soul	Bung	Shiong	Jáng-gi	Jio	Aiid	Yáue
Sour	Chup	Churpu	Moshenggá	Maikhí	Kune	Kunamá
South	Má	Dong	....	Khlá	Sokko	Soko
Speak	Lápche	Iekcho	Agánbo	Kurang, Raino	Agomludung	Agamlu-toká
Stand	Longche	Thingsho	Chádenbo	Gasang	Dág	Dág toká
Star	Kármá, Kám	Murgeng	Jáshki	Hatolthi	Tekár	Tákár
Steal	Áu	Gorbán	Cháubo	Sikhou	Dot pyong	Dotpi-toká
Stone	Do	Lung	Rong	Lanthái	Eling	Eling
Stop	Deh	Che, Nongsho	Ash-ku	Thá	Dúláh	Dúláh
Strong	Khekóye	Shiejáká	Bül-rákhá	Balagrá	Rálnám	Rálnám
Sun	Nyimá	Ngám	Sál	Sán	Arung	Dainyá, Arung
Sword	Jiring	Choáng	Millám	Imphe	Yaksá	Yoksá
Take	Básho	Bui	A'bo	Lá	Bom	Bomtoká
Thunder	Dhuke, Kyebe	Mungpholá	Makkhá khamá	Khurung	Domír	Domir mirdá
Tiger	Ták	Kháíla	Máchá	Masá	Sumyo	Sumyo
Tobacco	Támáku	Támku	Támáku	Thámku	Dhuwá	Dumwá

To-morrow	Nángpá	Námnying	Khinápo	Gábun	Iyámpo	Iyámpo
Tongue	Chye	Li	Shre	Chálái	Aiyo	Ioper
Tooth	So	Shiá	Wágom	Háthái	Aye	Aye
Tree	Jonshing	Shing	Bol	Bong pháng	Shine	Ishing
Village	Thong, í	Dung	Shong	Gámi	Dolung	Dolung
Uncle	Ákó. Ázhong	Azhung. Ajim	Áwang. Mámá	Áyong. Ámái	Páte. Pái	Páte. Pái
Want	Góbe	Sásphe	Náng bo	Mángo (Asam)	Ngombi	Ngom toká
War	Chetá	Chetá	Dákre ká	Ron (Asam)	Mimág	Mimág
Water	Chhu	Ri	Chi	Doi	Ásí	Áchye
West	Nug	Likhe. Nug	...	Cheváp	Dáuíáng	(Sun-set)
White	Káp. Kápo	Bálungbo	Gupok	Guphut	Wáng	Kámpo
Wife	Mobjye	Moibo	Michék	Bihí	Yáluu	Miyeng
Wind	Lung	Ridi	Bái	Bár	Ásár	Ásár
Woman	Ámchó	Moibó	Michék	Hinjo	Menge	Mimmo
Wood	Shing	Shing	Ámbal	Bon	Esing	Esing
Work	Láh	Leh	Gámbo	Hábámáo	Ageridung	Ager toká
Year	Ló	Ning. Ló	Bilsi	Basor (Asam)	Ditág	Ditág
Yes	Ing	Ong	O'e	O'i	Arwe	Hü. Ave. Eggidá
Young.	Zhem	Yonmo	Phánthe	Jala	Yámye	Yámye
One	Chi	Thur	Shá	Che	Áko	Áko
Two	Nyi	Nyik-ching	Gini	Nái, or Gni	Áni	Ániko
Three	Sum	Sám	Githom	Thám	Angom	Áumko
Four	Zi	Phi	Bri	Bre	Ápi	Ápiko
Five	Ngá	Ngá	Bongá	Bá	Pilángo	Ángoko
Six	Tu	Khung	Dok	Ro	Ákye	Ákengko
Seven	Dün	Zum	Sui	Sui	Konange	Kinit ko
Eight	Gyed	Yen	Chet	Ját	Pini	Piniko
Nine	Gú	Gú	Shkú	Chku	Kinide	Konángk
Ten	Chú	Se. Shong.	Skong	Jí	Inge	Uyingko

*A Brief Note on Indian Ethnology, by B. H. HODGSON, Esq.*

[The Editors of this Journal have great pleasure in being permitted to reprint the following short but highly interesting Preface to Mr. Hodgson's valuable work on the Aborigines of India. It affords such an exposition of the extensive bearings and high interest of Indian Ethnology, and of the mode in which this important subject should be treated, as at once to stimulate and direct future research. They further take this opportunity of again strongly commending to investigators the propriety of adopting uniformity of system, without which their researches will lose half their value; and in the matter of vocabularies, to make Mr. Hodgson's the standard. Upon points of this kind there will always exist slight differences of opinion; but these should give way to the important considerations alluded to; and if we are to be guided in this matter by the experience and judgment of any one man in India, surely none are entitled to higher respect than those of Mr. Hodgson.]

All those who are conversant with ethnology are aware that the pagan population of India is divided into two great classes, viz., the Arian, or *immigrant*, and the Tamúlian, or *aboriginal*, and also, that the unity of the Arian family, from Wales to Assam, has been demonstrated in our own times by a noble series of lingual researches—researches which have done for the history of Man a service analogous to that done for the history of the globe he inhabits by the fossil investigations of Cuvier.

The moral and physical condition of the several branches of the Arian race having been well known prior to these investigations, their sole object was to recover the clue to the common connexion and relationship of all the Arians, notwithstanding the obliterating effects on speech of ages of diverse social progress and of unrecorded migrations over half the globe's surface, and notwithstanding the striking physical changes worked in the lapse of ages by settlements in every clime, from the Equator to the Arctic circle. What a glorious triumph of literature to bridge such a profound and vast gulf!

The Tamúlian race, confined to India and never distinguished by mental culture, offers, it must be confessed, a far less gorgeous subject for inquiry than the Arian. But, as the moral and physical condition of many of the scattered members of the Tamúlian body is still nearly as little known as is the (assumed) pristine entirety and unity of that body, it is clear that this subject has two parts, each of which may be easily shown to be of high interest, not merely to the philosopher

but to the statesman. The Tamúlians are now, for the most part, British subjects: they are counted by millions, extending from the snows to the Cape (Comorin); and, lastly, they are as much superior to the Arian Hindus in freedom from disqualifying prejudices, as they are inferior to them in knowledge and all its train of appliances—a fact of which the extensive and important uses now making of the Kól or Dhánger race, offer a valuable exemplification. Yes! in *every* extensive jungly or hilly tract throughout the vast continent of India there exist hundreds of thousands of human beings in a state not materially different from that of the Germans as described by Tacitus. Let then the student of the progress of society, of the fate and fortunes of the human race, instead of poring over a mere sketch of the past, address himself to the task of preparing full and faithful portraits of what is before his eyes; and let the statesman profit by the labours of the student; for these primitive races are the ancient heritors of the whole soil, from all the rich and open parts of which they were wrongfully expelled by the usurping Hindus.\* It is *one* great object of this research to ascertain when, and under what circumstances this dispersion of the ancient owners of the soil took place, at least to demonstrate the fact, and to bring again together the dissevered fragments of the body, by means of careful comparison of the languages, physical attributes, creed and customs of the several (assumed) parts. It is *another* object, not less interesting, to exhibit the positive condition, moral and material, of each of these societies, at once so improveable and so needful of improvement, and whose archaic status, polity and ideas offer such instructive pictures of the course of human progression. Surely a subject so worthy, as this latter one, of the best attention and ablest examination ought not to be treated superficially, or as if we aimed merely to learn how far the aborigines have a common tie of descent. It is the great purpose of my copious and systematic vocabulary to display accurately the point of advancement which the aborigines have reached in thought and in action. And the more I see of these primitive races, the stronger becomes my conviction that there is no medium of investigation yielding such copious and accurate

\* It can hardly be necessary for me to say that I do not entertain the idle notion of now ejecting the Hindus and replacing the Aborigines, but that of drawing well-informed heedfulness to the condition and claims of the latter.



data as their languages. Their physical and mental condition is exactly portrayed in their speech, and he who can analyse it and separate the foreign elements, has the key to the amount, and sources too, of their civilization.

I have said that the unity of the Arian race has been demonstrated chiefly through lingual means. We have now similarly to demonstrate the unity of the Tamúlian race, an interesting but a difficult task ; for there is an immense number of spoken tongues among the Tamúlians, whereof I have already ascertained not less than 28 in the limited sphere of my own proposed inquiries ;\* and all these, though now so different as to be mutually unintelligible to the people who use them, require to be unitised, while one of the highest authorities† on such points fairly declares that he cannot tell what constitutes identity of language. It is clear therefore to me that in this inquiry we shall require all the helps within our reach, and that a copious vocabulary, as well as a rudimentary grammar, of each tongue, will be indispensable. But the rudiments of grammar are to be had only with extreme toil, as creations of your own, from the crude element of very corrupt sentences supplied by unlettered children of nature ; and, in proportion as all such grammars are likely to be deficient, in the same proportion do copious vocabularies become more and more desirable. Besides, summary vocabularies are apt to deal with generals, whereas particulars embody the character and racy virtue of speech. But homebred words are all *very* particular, and proportionably numerous ; while general terms, if more conveniently few, are less characteristic and very apt to be of exotic origin. Take the English general term to move ; it is Latin and one ; but of the numerous sorts of especial motion (to hop, to skip, to jump, to tumble down, to get up, to walk, to fly, to creep, to run, to gallop, to trot), all are “genuine Saxon, by the soul of Hengist.” Moreover it should be remembered that general terms are precisely those which rude races rarely understand or employ, and

\* I confine myself to the Aborigines of the mountains and the Tarai between Kumaun and Assam, a rich and extensive field of research. But I hope that other enquirers will, under the auspices of the Society, join me to complete the investigation. For the enumeration of the tribes see page 138.

† H. H. Wilson’s preface to the Mackenzie Papers. Wilson’s scepticism is somewhat wanton and affected : a sly hit at ignorance ?

hence by the adoption of such words in a summary ethnological vocabulary we shall probably miss the real import of words, and with it the power of comparing one language with another, since different respondents are not at all likely to give real equivalents or identical terms, unless the precise import of what is asked be thoroughly apprehended. There is yet another snare incident to vocabularies of a few general terms, even when of obvious meaning, to wit, that in the case of any general term you may get a word expressive merely of sex, age or other incidental distinction, from one respondent, and a word expressive of some other such distinction from another, as ox, bull, cow, heifer. The only safe plan therefore is to take specific terms, and a sufficient number of them, reserving abstract terms merely to illustrate grammatical structure, or the mental condition of the tribe you are investigating. Now, the long and perfect dispersion and insulation of the several members of the Tamúlian body have led to an extremity of lingual diverseness which, as contrasted with the similarity of their creed and customs, is the enigma of their race ; and for the reasons assigned it is an enigma which assuredly no Œdipus will solve except by *dint of words*. In Hindi and Urdu, though structure is the same, vocables make a difference which is broad and clear, owing to the evidently foreign elements of the diversity. Not so, however, in the Tamúlian tongues, in which there is very little of foreign element : all is homogeneousness in the vocables, and from its sameness of kind is less open to distinct separability. A summary comparative vocabulary was framed some years back by that able and zealous enquirer, the Rev. Mr. Brown, and it has been extensively filled up with the dialects of the mountaineers round Assam. But, in applying this vocabulary to the uses of the present Essay, I have found it quite insufficient to the ends in view ; to raise, not to solve, doubts ; and in reference to this question of the adequacy or otherwise of a very limited number of words even of a primitive character, I request particular attention to the fact, that the popular opinion of the decisive nature and effect of such words, propagated by that able polyglottist, Abel Remusat, has been lately shown to be *far* from decisive by Schott, whose observations on the subject may be seen, in lucid epitome, in Prichard's Physical History.\* Mr. Brown's words are scarcely of that kind which Remusat justly laid stress on as "pre-

\* Vol. IV. p. 395, and the following.

rogative instances" of speech.\* They are also, I think, much too few in number to yield decisive results, even had they been quite faultlessly selected. Any vocabulary that aspires to be useful, must, however summary, contain a fair portion of words belonging to each and all of the "parts of speech," and must also give the cardinal numbers, at least down to 10. I am well aware that the prolixity of my own vocabulary may be objected to. But let it be remembered that I have a high object, wholly extrinsic to the mere lingual testing of ethnic affinities, and that is, the ascertainment of the physical and moral condition of the primitive races, which are the objects of my labours, and that I hold there is no medium of such ascertainment comparable with their languages. But I have no hesitation in adding my conviction that mere ethnological affinities cannot be satisfactorily tested by summary vocabularies; that structure as well as vocables must be attended to; and lastly, that even the sheer words of languages so wholly new to us cannot be safely got at unless we seek them in more than one form, and thus obtain means of comparison.

With regard to the *second* object of these inquiries, or the determination of the moral and physical status of each aboriginal people, it is to be observed that, as the Tamúlians have, none of them, any old authentic legends, and are all very uninformed, save in what respects their immediate wants and habitual ideas, it is exceedingly difficult to learn any thing of this sort from them *directly*: their creed especially is a subject of insuperable difficulty, through the sole medium of direct questioning: their customs, again, are apt to afford but negative evidence, because, being drawn from boon nature, they tend to identity in all the several nations; and lastly, their physical aspect is of that osculant and vague stamp, which indicates rather than proves any thing; or rather, what it does prove is general, not particular. We are thus

\* For example, light, lux, is a high abstraction which none of my informants can grasp, though they readily give equivalents for sunshine and candle or fire flame. But further, whoever will carefully examine my essay on the affinities of the sub-himalayan tribes in the Journal of the Asiatic Society of Bengal for December 1847 (vocabularies), will find that the lingual traces of relationship between these tribes are by no means correspondent with Remusat's theory. Nor differences nor resemblances are in harmony with that theory, and we have thus a striking practical proof of the value, and necessity indeed, of copious vocabularies as guides to, and indices of, the status of each tribe.

driven back through all the media of research upon the grand stay of a copious vocabulary. It is my fixed conviction that every distinct effective idea must have an appropriate word to express it ; that the more important the idea or want (if felt by the *parties themselves*) the more surely will the correspondent term be forthcoming. Now, in regard to the creed of two of these nations (the Bódó and Dhimal), I have toiled for weeks to come at the verity by means of direct questions ; and yet, if at this moment I have any distinct notion of the real belief of these people, certainly I am as much indebted for it to my ample vocabulary as to all my direct interrogations. In the vocabulary, I find no adequate word for God, for soul, for future state, for Heaven, for Hell, for piety, for sin, for prayer, for repentance, for pardon ; and I apply this broad and sure basis of inference, but without exaggeration, to its legitimate purpose ! Nothing can exceed the vagueness of all direct statement on this most important of subjects : the gods (void of godhead : creator, lawgiver, judge) are very angry : why ? *not* because *you* have sinned, but because *they* are neglected : they must be flattered with gifts. This is all ; *save* what may be surely, if carefully, gathered from a copious vocabulary. I have adverted to the number of people whose speech is to be investigated (28), as well as to the careful and ample style of investigation which I conceive can alone suffice for the realization of the ends in view ; for our aim is not to raise doubts but to solve them.\* But time is the most precious of all things ; and as the present investigation has cost me six months, I purpose to seek aid and help from abroad, furnishing to each of my co-operators the present paper as a model, it being indispensable for purposes of *ready* and *effective comparison*, that all information should take a like direction, and that direction a sound and good one. In submitting therefore the first of an intended series of papers to the Asiatic Society of Bengal, I have the honour to solicit its revision of my labours, in order more particularly to render the form of the vocabulary and grammar as good as may be, containing *all that is essential* and *nothing superfluous*. Should the Society favour me with any such suggestions, or should it practically ratify my present work by printing it, I intend forthwith to have 50 blank and 50 full copies of the Essay printed for distribution†

\* See note at the end of this Preface.

† Any person desiring a copy can have it by applying to me at Darjeeling or to Mr. Laidlay, at the Asiatic Society, Calcutta.



to co-operators ; and meanwhile I shall conclude this too long preface with a few explanations of the reasons which have led me to give this particular form to the vocabulary, the grand stay, as I conceive, in these inquiries, for the reasons already given. It will be seen at a glance that my vocabulary is not alphabetical. I think the alphabetical plan liable to two extreme objections ; for we become thus entangled amid synonyma that are superfluous or deceptive, and among vague words that are worse than useless. But, worse than this, the alphebetical plan is void of all that facilitation which is so indispensable towards the accomplishment of the end in view, it being at once most difficult, and most necessary to lend the vagrant minds of our primitive informants some helps towards alertness and steadiness of attention in this to them so new, so strange, and so tedious, a labour. The principle I have proceeded upon is the association of ideas by similitude, contrast and habitual connection ; and I have found this grand principle, (which is to our *cogitative what sympathy is to our emotive faculties*) when understood and applied with the requisite simplicity, to be of great assistance to myself in guarding against vague words, whose name is legion, and of yet more and more important assistance to my primitive-minded respondents. In numberless instances the mutual doubts created by the first word were removed by mere utterance of the correlative or contrasted term ; whilst in each of the arts and crafts the clue furnished by connexion and dependancy of parts enabled me rapidly and surely to work onwards with the vocables. I purposed also at the same time thus to prepare so many distinct pictures of the state of knowledge in its several departments,\* such as it is within the ken and use of the races interrogated (an important part of my plan of absolute as well as comparative estimates) ; and, even when no such knowledge was to be had in the particular case before me, I have carefully preserved the blanks, deeming the negative almost as valuable as the positive evidence—not to mention that, having in view application to other respondents of different nations, it followed that the blanks in one paper might be well filled in another. Still, the vocabulary is too large and too difficult ;

\* The table of contents at the end of the Volume, or the separate headings in the body of the vocabulary, will show at a glance how this object has been sought to be gained. Unhappily the headings or titles have been very imperfectly struck off at press.

and it is therefore a great object to reduce it in the complex terms without mutilation, and also to give the essentials of grammar with the utmost simplicity and conciseness ; and for aid to these ends I shall be thankful, though no pains have been spared to render the whole paper as it now stands, worthy of the Society's acceptance and a fitting model for future research. Of the three separate people\* treated of (the Kóch, the Bódó, and the Dhimál), I have given physical delineations of the Bódó only, because the faintly yet distinctly marked type of the Mongolian† family is similar in all three, but best expressed (so to speak) in the Bódó features and form. I am not unaware that a great deal has been already done in the line of research which I have now, not taken up,‡ but resumed, and if I have not adopted and followed up the method of investigation of any of the many able men who have, with reference to my present attempt, preceded me in this field, it is not because I am insensible of the value of those labours, but because their diversity is quite opposed to every idea of system, where system is most needful, and *that* the best system : wherefore the corrections of the Society are solicited for my own work prior to its dissemination (as a model) for being filled up by various co-operators either within the limits assigned to myself (if such aid can be had), or elsewhere and beyond those limits.

B. H. HODGSON.

*Darjeeling, June, 1846.*

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NOTE.—The great Scythic stem of the human race is divided into three primary branches, or the Tangús, the Mongol, and the Túrks. The first investigators of this subject urgently insisted on the radical diversity of these three races : but the most recent inquirers more incline to unitise them. Certainly there is a

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\* I distinguish by language, and assume that wherever there is a broad spoken diversity of tongue unintelligible to neighbours, there is distinct people. The value of these spoken diversities will be hereafter determined as one general result of the inquiry on foot.

† Mongolian? *potius* Scythic.—See the appended note on the subject.

‡ When I went to England in 1844, I possessed vocabularies of all the languages and dialects of Nepal : but these, with many other valuable papers, were lost owing to circumstances I need not dwell on. I have recovered some fragments, and am reconstructing the vocabularies of these dialects upon the plan above delineated.

strong and obvious character of physical (if not also of lingual) sameness throughout the Scythic race; and it is remarkable that this peculiar character belongs also to *all* the Aborigines of India, who may be at once known, from the Cávery and Vigarú to the Cósi and Bhagarati,\* by their quasi-scythic physiognomy, so decidedly opposed to the Caucasian countenance of the Arians of India, or the Hindus. I apprehend that there will be found among the Aborigines of India a like lingual sameness, and that very extended and very accurate investigation will consequently alone suffice to test the real nature and import of the double sameness, physical and lingual. That all the Aborigines of India are Northmen of the Scythic stem, seems decidedly and justly inferrible from their physical characteristics. But, inasmuch as that prodigious stem is every where found beyond the whole Northern and Eastern boundary of India, not merely from Attok to the Brahmaputra, where these rivers cut through the Himálaya, but from that point of the latter river all the way to the sea; and inasmuch as there are familiar and trite Gháts or passes over the Himálaya throughout its course along the entire confines of India from Kashmír to the Brahma Kúnd, it follows of necessity that very careful and ample investigation will alone enable us to decide upon the question of the unity or diversity of the Aborigines of India, in other words to decide upon the questions, whether they owe their confessed Scythic physiognomy to the Tangús, the Mongol or the Túrks branch of the Tartars or Scythians, and whether they immigrated from beyond the Himálaya ("the hive of all nations") at one period and at one point, or at several periods and at as many points. Between Gilgit and Chittagong there are 100 passes over the Himálaya and its south-eastern continuation to the Bengal Bay; while for the *time* of passage, there are ages upon ages before the dawn of legend and of chronicle.

I incline to the opinion that the Aborigines of the *sub-Himálayas*, as far east as the Dhansiri of Assam, belong to the Tibetan† stock, and east of that river to the Chinese stock—except the Gárós and other tribes occupying that portion of the Hills lying between Assam and Sylhet; and that the aborigines of the *tarai* and *forest* skirting the entire sub-Himálayas, inclusive of the greater part of the marginal circuit of the Assam Valley, belong, like those last mentioned, to the Tamulian stock of aborigines of the plains of India generally. But what is this Tamulian stock? what the Tibetan stock? and what the Chinese? and to which of the three grand and well known branches of the Scythic tree (Tangús, Mongol, Túrks) do the Tamulians,‡ the Tibetans and the Chinese§ belong?—I have now said enough to enforce caution and stimulate curiosity, and I pause.

\* Alpine feeder of the Ganges, not its Bengal defluent. So Alpine Cósí.

† Notices of the Languages and Literature of Nepal.

‡ The *Tartars* of China are Mantchúrian Tangús. I allude to the Chinese proper.





INSCRIPTION FOUND AT KEDDAH BY LIEUT. COLONEL LOW

വർദ്ധിച്ചുപ്രസന്നതാലംകരണമുദ  
 മതാ മതാദിനാമ പദമെഴുതാമുദ  
 മിന്നിപ്പോയിരുന്നെങ്കിൽ മേൽപ്പറഞ്ഞ  
 മേൽപ്പറഞ്ഞവർക്കു കർമ്മദാനം

*On an Inscription from Keddah, by Lieut.-Col. Low.*

I have the pleasure to forward to you, to be presented to the Asiatic Society, a fac-simile of another inscription, in the same character apparently as that in which one of the inscriptions lately transmitted to you by me was couched, and which I found very lately, and after that last had been forwarded.

It may not however be of much importance, and I apprehend may prove but some religious text of the Buddhists or some other sects. It was lying under the centre of the foundation of a ruin of an ancient brick building in Keddah, near Buket Murriam. This building had been very small, not more than 10 or 12 feet square. When I raised the slab of stone, it was coated with a tenaceous film of carbonate of lime, produced by the coral stones of the foundation having decomposed. The stone being a sort of slate, this has enabled me to bring out all the letters (a few only being at first visible) by the application of nitric acid. The inscription is in perfect preservation.

I have the pleasure also to send another piece of the Singapore stone; there are several ponderous masses remaining, but that part of the inscription which are on them are the *most* defaced. I will try however, when I have leisure, to copy such parts as are at all capable of being taken off, but the stone is so rough that this will be difficult to accomplish.

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*Note on the foregoing.*

Col. Low's inscription possesses, I think, sufficient interest to warrant the insertion of a reduced fac-simile in the Journal, and I give it according in Plate X. There is no difficulty in recognising in the first two lines the well known formula *Ye dharmma hetu prabhavá*, &c.; but, if I am not mistaken, it is in a form of the Sanskrit alphabet much older than any in which it has been discovered elsewhere. We have in the Museum—thanks to the zeal of Capt. Kittoe—a goodly assortment of Buddhist sculptures from Behar, containing these verses mostly in the *Kutila* modification of the Sanskrit character, which belongs to the

tenth century of the Christian era ; while that of Col. Low's inscription corresponds very closely with the alphabet assigned to the fifth century in Prinsep's palæographic table (J. A. S. Vol. VII. pl. XIII).

Another point of interest in Col. Low's inscription is the substitution of a different couplet for that which usually follows the lines above alluded to. Mr. Hodgson long ago remarked\* that there is no necessary connection between the two couplets ; and Prinsep stated,† on the authority of Ratna Pála, that another series of verses follows the *Ye dharmma*, &c., in the daily service of the temples in Ceylon. In the expectation that the lines in Col. Low's inscription would prove to be those of the Ceylon ritual, I sent for Ratna Pála and showed him my transcription : but he seemed to have forgotten all about the matter, and was unable to supply me from memory with the verses referred to, or to recognise their identity with those of the inscription.

The subjoined is a transcript of the verses in the Deva nagarí character :—

ये घर्मा हेतुप्रभवा तेषां हेतु तयागता  
 तेषां च यो निरोध एवं वादी महाव्यसण  
 पाप्मनोच्चोयते कर्म जन्मनां कर्म कारणं  
 ज्ञानान्न क्रियते कर्म कर्म भावन लोयते

“Whatever moral actions arise from cause, the cause of them has been explained by TATHÁGATA. What is the check to these actions, is thus set forth by the great SRAMANA. Vice promotes action, and action is the cause of transmigration. He who, through knowledge, performs no action, is not subject to its effects.”

It will be observed that the first line of the latter couplet is identical with one in an inscription from the same neighborhood published in the July number of the last volume of the Journal.

On the subject of the doctrine here propounded, Rájendralál hands me the following note :

“This is but another version of the maxim inculcated by Krishna and other vedantic preachers on the uselessness of *Karma* (religious action originating in the hope of recompence) as a means of

\* J. A. S. Vol. IV., p. 211.

† Ibid, p. 138.

salvation. The Hindu sages however maintain "*rajaguna*" (the quality of passion) and not "*tamas*" (darkness or vice) to be the cause of transmigration; but as the consequences of both *rajas* and *tamas* are borne in inferior states of existence, which necessarily imply repeated birth, the disagreement is not of any great importance."—J. W. L.

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*Note on Iron Tension Bridges, by the Rev. J. H. PRATT.*

*To the Editors of the Journal of the Asiatic Society.*

Since my return to Calcutta after an absence of four months I have observed that my friend Major Goodwyn has forwarded to you an article on Iron Tension Bridges, which you have printed in your number for October last. In this article he does me the favour of noticing with approval the Memoir I sent you at the beginning of the same year, on the "Quantity of Iron necessary in a Tension Chain Bridge."

The sole object of my troubling you with the present brief communication, is to point out that Major Goodwyn has made my Memoir say more than I intended it should. In his para. 2 he observes as follows upon the property which I had demonstrated :—

"2. This is a very important conclusion; but whilst I freely admit the soundness of the doctrine, I am not fully satisfied as to the correctness of the writer's practical deductions therefrom; viz. that the old system of suspension, consisting of a uniform chain and vertical drop-bars, is the most proper for adoption *under all circumstances*." (See p. 413, Vol. for 1848; the *italics* are mine.)

But I have taken only *one* circumstance into account in my Memoir, and have pronounced an opinion upon *that only*; viz. the consideration of the *quantity of metal* employed in the construction of the Bridge. Some persons had strongly asserted that one advantage of the new system was considerable economy of metal. This gave an importance to the conclusion to which my calculation led.

In endeavoring to come to a decision upon the merits of the Taper-Chain system, when compared with the Common Chain, there are *several* considerations which must be borne in mind and well examined—such as regard, for instance, the elegance of the structure, the convenience



of water-way, the stability or steadiness of the bridge, its durability, as well as the quantity of metal required in its construction. It was to the *last only* of these considerations to which my Memoir referred; and after enunciating the exact theoretical result to which I came, the practical conclusion was stated thus:—

“The *economy of iron* will be practically greatest in bridges where the varieties\* of tension are least. This tells, then, in a practical point of view, against the Taper-Chain system, in the question Taper-Chain versus Common Chain Bridge.”

But the Common Chain Bridge *might* be considered far less *elegant*, or less *convenient* for the passage of boats under it, or less *durable*, or less *stable* than the Taper-Chain Bridge for any thing my demonstration had proved. It was only on the *Economy of Iron* that I touched.

I purposely confined myself to this one point, that I might avoid being involved in controversy. And I thought I was safe from this, as the proof of the proposition I enunciated is a mere piece of geometry; and the brief practical inference from it is so obvious that no one can doubt its truth.

At the time of my committing this demonstration to paper at the request of another friend,† who also proposed that it should be printed, I had begun to take up the question of the comparative stability or steadiness of the two systems, especially when heavy weights pass along the roadway, and its parts are *successively* pressed down; and not simultaneously, as when the bridge is loaded uniformly from end to end, by the greatest weight it can ever have to sustain. This view of the subject *might* have been favourable to the Taper-Chain system. But, I am sorry to say, that I found the subject so inviting, and therefore my

\* By “varieties,” I did not mean *changes* of tension in the *same bar* as different weights were placed on the bridge, but “varieties of tension” in considering the various parts of the bridge at any one instant. Thus, for example, in the common Chain Bridge with vertical suspending rods, the strains of these rods, when the bridge is uniformly loaded, are nearly the same, there is no variety: whereas in the oblique suspending rods in the Taper-Chain, those near the centre are far more strained than those near the ends of the bridge; i. e. there is a greater variety of tension. I have no reason for supposing that the expression I used has been misunderstood. But we never lose any thing by adding to the perspicuity of our language—especially in such subjects as the present.

† Colonel Forbes.

time and thoughts so much in danger of being engrossed by it, at the expense of more important matters, that I felt obliged to tear up what notes I had written. I mention it now only to show that I never conceived that the Memoir you printed for me in your number for January 1848 had entered upon the *whole* subject; but only upon that part of it which I took care to notify, and which appertains to the Quantity of Metal required in the construction.

P. S.—Since sending you the above my eye has alighted upon a passage in Major Goodwyn's article, which explains various expressions which he has in other parts used in reference to my Memoir, and which before puzzled me much, as perhaps they have puzzled others who may have read both communications.

In opening the exposition of his "Resultant System," he says, (p. 419):—"I will now proceed to explain a system which only proposes to do what the formulæ in Mr. Pratt's Memoir says may be done." But there *are no formulæ* in my Memoir; nor is any thing said about formulæ; nor is any reference made to any; nor inference drawn from any. The Memoir is, as I have said, a mere piece of geometry, leading to a remarkable general principle regarding the amount of *tension* in a suspension bridge of any kind, Taper-Chain or not, and therefore the *quantity of metal* necessary for its construction. The demonstration stands alone, and is independent of all hypothesis regarding the form of the bridge.

This, therefore, convinces me that Major Goodwyn must have some other paper in his mind: and that in writing his article he has had both that and the Memoir before him, and has treated them as *one*.

In 1843, when public attention was being called in India to the subject of Taper-Chain Bridges, I gave my voice decidedly against Mr. Dredge's system, to friends with whom I conversed upon the matter, as utterly impracticable, as well as unscientific: and I drew up some mathematical formulæ which might be applied to prove the truth of my assertions, and also to calculate the strains in theory of the various parts of a suspension bridge constructed upon any principle whatever. These formulæ were applied to several examples, among others to the projected Balee Khal Bridge: and as they are now referred to for the first time in your Journal (in the article I am noticing) I may mention as an evidence of their correctness, that, among other results to which they

led, they pointed out that the tendency of the road-way, even should it stand, would be to sink in the middle—which any one who visits the bridge and views it from the river will see is the case: and also that the bridge would not stand, unless the middle link of the chain were considerably strengthened. This last has had a double verification; first in the lamentable fall of the structure; and, secondly, in its subsequent permanence since being reconstructed with the *double* central link which it now has.

These formulæ were printed, I think, in 1846, (but without any explanation of the manner in which they were to be used,)\* as an Appendix to an important Report on the causes of the failure of the Balee Khal Bridge, and the method of its re-construction, in the Transactions of the Royal Engineers. No direct reference was made to the formulæ in the Report itself: they were added probably for future use.

These then must be, I conceive, the formulæ which Major Goodwyn has in his mind in the passage I have quoted from his article of October last. But my Memoir has no connexion with them whatever: nor have I ever put in print any deductions from the formulæ till induced to do so in the present communication.

*Calcutta, March 28th, 1849.*



*A Seventeenth Memoir on the Law of Storms in India, being Storms of the China Seas from 1842 to 1847, and some of the Northern Pacific Ocean, from 1797. By HENRY PIDDINGTON, President of Marine Courts of Enquiry, Calcutta.*

[Concluded from page 45.]

#### TRACK S.

**ROB ROY'S** *Manila Typhoon of 13th Nov. 1847.*

The *Rob Roy*, which vessel was dismasted on the 18th November in the Cyclone laid down in the preceding section, met with another

\* An explanation was subsequently sent to the Publisher of the Transactions to supply this deficiency as soon as I was aware that the formulæ had been made public.

Typhoon, in which she was nearly driven from her anchors, and wrecked at the entrance of Manila Bay. At Manila this Cyclone was very destructive.

*Abridged extract from the Log of the Barque ROB ROY, Capt. FRANCIS.  
Civil Time.*

On the 12th November the *Rob Roy* anchored at 6 P. M. in a calm in 22 fs. at the entrance of Manila Bay, with the flagstaff on Corregidor bearing S. S. E. and veered to 45 fs.; a strong breeze springing up from the N. W. let go best bower and veered to 90 fs. on small and 75 on best bower. Midnight hard gale with dark gloomy weather; sea washing over the vessel fore and aft. Bar. marked 29.80 6 P. M.; 29.50 at 8½; 29.30 at 11, 29.20 at 1 A. M.

13th Nov.—1 A. M. small bower parted. At 2 the height of the Typhoon, Ther. 78°. Bar. 29.20; at 4 more moderate; 11 A. M. weighed and made sail for Manila.

During the Typhoon the wind was from N. N. W. to N. E. b. N. and died away at S. W.

REMARKS.

This veering of the wind would seem to indicate a track from the N. ½ E. to the S. ½ W., but we are rather embarrassed to judge of it by what follows, that it “died away at S. S. W.” which would make the Cyclone curve up to the N. W. round Punta Luzon, unless we consider the vessel’s position, which was that of being anchored in a narrow channel, and during the whole time under the lee of the high mountain, of Maribeles, the termination of the lofty coast chain which runs down to the Bay of Manila. The Island of Corregidor also, so near to which the vessel was latterly drifted, that as Captain Francis informs me, the back wave from the rocks was felt, is high, and thus the vessel was completely under its lee when the wind came in that direction. The winds moreover in the entrance to a large bay like that of Manila, may be so variously deflected by the coasts that unless blowing with violence we can scarcely venture upon any deduction.

I have thus marked this track as one coming down from the N. ½ E. to the S. ½ W. The seaman will understand however that this is to some extent conjectural.

*Barque EASURAIN’S Cyclone off the Mindoro Channel, and Straits of St. Bernadino.*

I obtained the Log of this Cyclone after my chart was completed, and have thus been unable to include it, but as it occurred in a part of



the China Sea much frequented at that season of the year in which the Palawan Passage is adopted, and is, though not of any great severity, corroborative of the tendency of the tracks here to the Westward, I have not thought it right to omit noting it, especially as the fall of the Barometer was as much as 0.4 in fifteen hours, and we have only hereabouts, as yet, the two Cyclones of the American ship *Panama*, laid down from Mr. Redfield, in the sixth of these Memoirs.

*Abridged Extract from the Log of the Barque EASURAIN, Capt. J. SHIRE, from Singapore to China—reduced to Civil Time.*

The *Easurain* was on the 11th Nov. 1847 in  $11^{\circ} 40'$  North ; Long.  $118^{\circ} 45'$  East ; Bar. 29.76 ; Ther. 84, with the wind W. b. N., a fresh breeze and squalls to midnight, with a head swell ; vessel standing to the N. N. E.

12th Nov.—A. M. the same to noon ; wind hauling to N. West, when Lat. by Acct.  $12^{\circ} 39'$  N. ; Long.  $119^{\circ} 27'$  E. ; Bar. 29.75 ; Ther. 86, and wind increasing. P. M. Wind N. W. increasing to half a gale, with a high sea, and at night threatening with hazy weather and drizzling rain ; prepared every thing for bad weather. Midnight severe squalls with rain and furious gusts.

13th Nov.—At 3 A. M. Bar. 29.35. At daylight the same weather ; 7 A. M. wind S. W., and at Noon W. S. W. when Lat. indiff. Obs.  $13^{\circ} 10'$  N. ; Long.  $119^{\circ} 06'$  East ; P. M. wind moderated at W. S. W. and South.

On the 14th fine weather ; Lat.  $15^{\circ} 07'$  ; Long.  $119.0$  East.

It might at first sight be supposed that this Cyclone, occurring on the same date and so near to that of the *Rob Roy's* just noticed, has some connection with it, but it will be seen on comparing them that the *Rob Roy* anchored at 6 P. M. on the 12th in a calm, while at this time the *Easurain* at 120 miles distant had already half a gale at N. W., and that midnight only it was a hard gale with the *Rob Roy* from about N. N. W. to N. W., as well as we can judge from her note. The veering of the wind also with the *Easurain* is that of a Cyclone travelling out of the Straits of Mindoro, or of St. Bernadino, on a Westerly course, and cannot be reconciled to the track supposed for the *Rob Roy's*, which by its duration also (about 10 P. M. to 6 A. M.) was of very small dimensions, or passing very rapidly, while the *Easurain's* lasted 20 to 24 hours. Had the two Cyclones been but one it must have commenced sooner with the *Rob Roy*, and the shift or veering with the *Easurain* should have been into the N. E. quadrant, and not into the S. E. one. On all these grounds then I should take them as

separate Cyclones occurring at a time when, as will be seen in the following section, great atmospheric derangements were prevalent thereabout. I therefore consider it as an East and West track passing a little to the Northward of the *Easurain's* position on the 13th, or in Lat.  $13^{\circ} 30'$  North.

### TRACK T.

*EASURAIN'S Typhoon in the China Sea and Bashee Passage,  
Nov. 18th to 21st 1847.*

I am indebted to Capt. Shire not only for his log book and Chart, but further for much verbal information and a valuable memorandum on the appearances of the weather, which I shall quote largely in the summary following the Log. This Cyclone furnishes us not only with a new track for the Tyfoons of the China Sea, but moreover for a most remarkable anomalous instance thereof; in a Cyclone travelling to the Northward and then (being as I suppose deflected by the high land of Formosa) curving off to the *westward* of the meridian!—the first Cyclone which we have found so travelling\* in the Eastern Hemisphere, though in the West Indies in the corresponding latitudes this is their common course.

*Abridged Log of the Barque EASURAIN, Capt. W. H. SHIRE, from  
Singapore to China, reduced to Civil Time.*

On the 16th Nov. the *Easurain* was at noon in Lat.  $17^{\circ} 03'$  North; Long.  $119^{\circ} 45'$  E.; Bar. 29.70; Ther.  $82^{\circ}$  with a moderate breeze and fine weather; 2 P. M. wind increasing with a high sea and vessel preparing gradually for bad weather.

17th Nov.—A. M. to Noon wind increasing and weather growing worse, Barometer having fallen to 29.39.; Ther.  $82^{\circ}$ . Wind steady at North; Lat. Acct.  $17^{\circ} 13'$ ; Long.  $119^{\circ} 41'$  E.; P. M. gale increasing from North with great violence, veering to N. W. b. N. at 10 P. M.; midnight a hurricane.

18th Nov.—A. M. wind still increasing, laid too under bare poles; 3 A. M. Bar. 29.04. Daylight it fell calm but no sail made, and it soon after sprung up from the S. W. again with fearful squalls and torrents of rain. Ship making bad weather, scudded under foresail and fore topsail. Noon Lat.  $18^{\circ} 04'$  N.; Long.  $119^{\circ} 02'$  E.; Bar. 29.29; Ther.  $82^{\circ}$ . P. M. gale continuing; 7 P. M.

\* The meagre and uncertain notice of the *Don Juan's* at page 33, I have already noticed as one which we cannot rely upon, though from this it seems now probable.

broached to, carried away boats, &c. ; continued to scud till midnight with the wind still at South.

19th Nov.—At 2 A. M. Foresail blew away and the ship was compelled to heave to again ; Noon Lat.  $19^{\circ} 10'$  North ; Long.  $119^{\circ} 30'$  East ; Bar. 29.42 ; Ther. 79.0. P. M. wind South ; Tyfoon till midnight and ship driving to the Northward.

20th Nov.—Wind still at South, somewhat moderated. Daylight kept away to repair damages. Noon Lat.  $20^{\circ} 21'$  N. ; Long.  $120^{\circ} 13'$  East ; Bar. 29.45. Wind still at South. At Noon hurricane came on still more severe with a cross turbulent sea rendering it dangerous to run. At 2 P. M. hove too. Sunset more violent to midnight. Ship from 2 P. M. driving to the Northward at the rate of about  $3'$  per hour on to the Vele Rete\* rocks, the violence of the wind and sea being such that it was impossible to steer any kind of course to clear them.

21st Nov.—Midnight suddenly fell calm, a calm of the most dangerous description, as the ship was rolling helplessly with a tremendous lee sea ; Bar. falling to 29.25. At 1 A. M. a faint air sprang up from the Northward ; set the close reefed fore-top-sail to get her head to the Westward, but had hardly done so when a most dreadful hurricane burst upon the ship from the Northward, laying her upon her beam ends and exposing her deck entirely to the previous heavy sea from the Southward ;† and at the same time a frightful sea came rolling down from the Northward ; lost fore and main topmasts ; ship now drifting to the Southward again ; Noon Lat.  $20^{\circ} 33'$  N. ; Long.  $120^{\circ} 30'$  East ; Bar. rising to 29.50 ; P. M. wind North but moderating ; ship lying too till midnight.

22nd Nov.—A. M. Daylight moderating ; made some sail. True course made W.  $\frac{1}{2}$  N. ; Noon Lat.  $20^{\circ} 29'$  N. ; Long.  $110^{\circ} 37'$  East ; Bar. 29.76. Ther. 78.00. P. M. wind N. E. ; moderate gale with a cross turbulent sea ; at midnight moderate.

23rd Nov.—Lat. Noon  $20^{\circ} 17'$  N. ; Long.  $118^{\circ} 15'$  East ; Bar. 29.84. Ther. 80. Ship arrived at Hong Kong on the 25th.

*Captain SHIRE has enhanced the great value of his contribution to our science by the following notes on the appearances of the weather, the sea, the compasses, &c., which I print with some slight abridgements, entire, before giving my own remarks :*

On leaving Singapore on 26th Oct. 1847, from the entrance of Singapore strait until on the coast of Palaworn, 10th Nov. had remarkably clear

\* So in the Charts, the proper name no doubt is the Spanish *Las Velas Rotas* ; (the *torn sails*.)

† See further the remarks on this dangerous incident of a lee-sea in the height of a Cyclone.

weather with calms, the high peaks of the Natunas having a peculiarly sharpened clear appearance, and all the other land that we passed appeared to be much more elevated, and was visible to a greater distance than usual. On the change of the moon the appearances altered, and indistinct flashes of lightning were visible, without any dark clouds, but on the next day a very heavy squall came on suddenly and disappeared as quickly again, leaving the air as calm and clear as before; but the most remarkable circumstance of the voyage was the remarkably clear and well defined appearance of the horizon at night. Although at the period when the moon shews least light, it seemed as if some artificial or phosphoric light were present relieving, the natural dimness which more or less prevails about the horizon line at night; and in all quarters the stars were as distinctly seen rising and setting as the sun at sunrise, or as the moon when she sets. When I told the Singapore people of this on my return they said that it is a general precursor of a typhoon in the China Sea, and my own experience in the Arabian sea, where I saw the same thing, confirms me in thinking that it deserves to be noted.

On clearing the reefs, and arriving on the coast of Luconia the weather became thick and drizzly, and we had hardly time to get ready by sending down the upper spars before it came on most furiously, first at N. W. then veered to West, and finally to S. W., at which point about daylight on the morning it fell a calm, but it was a calm of a different description from occurrences of the same kind after ordinary gales. The whole atmosphere appeared as one thick curtain (without a break any where) of thick fog-bank, if I may use the expression, blending the water and sky in one continued mass, and accompanied by that dull, melancholy sound described in the Horn Book. It remained this way for half an hour, and then freshened up rapidly, and commenced to whistle and roar as it had previously done, and brought a succession of dreadful squalls rendering it impossible to look to windward a moment. It lasted altogether about 36 hours, veered to S. E. and died away as we ran out of it: as the log book shews. We fell in with another in four or five days afterwards, which commenced from the North and N. W. also, but with clear weather, the only angry looking clouds were those collected on the top of the range of mountains which run North and South on Luconia, at the same time that the lower parts were distinctly visible. Another sign which I have noticed in the Arabian sea; and in the Bay of Bengal also, is a very thin transparent cloud that flies generally high up, but with much greater velocity than any other clouds present, and as if it was torn from some larger fragment of the same kind as itself. The Barometer gives but very little warning there, and only falls apparently as the gale increases.

When it veered to South, again put the vessel away before it and scudded her until she broached to, and we could scud her no longer; we then lay to and were driven, whether we would or not, in the direction of the Vele Rete rocks. It



was hopeless to try and keep her away, as she would not pay off, and had the calm centre not providentially passed over us again, the ship and all on board in another half an hour would in all probability have perished.

The calm was precisely of the same description as the former one, but it shifted more suddenly, and the shock, roar and fury of the wind was more instantaneous, and terrible; the vessel was thrown on her broadside and the deck was instantly filled by the previous overwhelming sea that rushed in from the Southward, which must soon have torn to pieces any vessel if exposed to its fury long, but fortunately with the Northerly wind there came a perfect deluge of rain which speedily reduced the previous sea, and kept the new one from rising.

The Barometer rose rapidly as the rage of the Cyclone passed on, and by daylight next morning there was a decided improvement in the appearance of the weather.

I will mention another circumstance that may be perhaps interesting, as it was certainly new and startling to me, and that was that we could get none of our compasses to remain steady, but at every succeeding burst of those heavy squalls they spun round and round eight points at a time, and we had no other means of steering but by the roll of the sea and the feel of the wind upon the back part of the head, and this continued for some time after the gale had passed, and rendered the approach to the land upon any safe course very precarious. Ropes on board of a ship that are kept at a great degree of tension, such as the Royal halyards, I have frequently noticed previous to the coming on of a breeze when the weather is apparently very fine, emit a peculiar kind of singing noise, and although it may seem whimsical to say so, whenever I hear it I begin to look round and see that all is ready for emergencies, as on two or three occasions of unsuspected bad weather, whether accidentally or not, I have noticed this peculiarity.

#### REMARKS.

This Cyclone deserves our most careful consideration on many accounts, but principally from its being the first authentic record we have of a Cyclone curving off to the Westward when approaching the tropic; though it had already been conjectured by Mr. Redfield, Col. Reid and myself\* from analogy that this might take place on the coast of China.

We find, then, that on the 17th, the *Easurain* was at about 40 miles from the Western Coast of Luconia, in  $17^{\circ} 13'$  North, with a gale from the North, which at 10 P. M. veered to N. W. b. N., and at midnight was a hurricane.

\* Horn Book for the Eastern Seas, p. 24.

At this last time therefore the centre must apparently have been to the N. E. b. E. of her, either inland or upon the coast of Luzon, (taking it to have been only 80 miles in diameter in the last case,) and as from midnight to daylight when it fell calm, the vessel was lying too, she had not made much distance to the Southward. Capt. Shire's Chart places her about this time in Lat.  $16^{\circ} 55'$ ; Long.  $119^{\circ} 35'$ ; and the shift here was from N. W. b. N. to the S. W. This would show a track off the land, but I learn from Capt. Shire that it drew to N. N. W. and West before it sprung up at S. W. veering to South by Noon, when the vessel had run 69 miles to the Northward, as she had reached  $18^{\circ} 04'$  North.

It would seem then, that at this time, or from midnight to nearly Noon, the Cyclone had either been forming or descending\* about the ship's position, or it may, not improbably, have been forcing its way over the high land of Luconia, and this, whether formed upon the land, or as is also probable coming in from the Northern Pacific, as the Cyclones of the Bay of Bengal cross the Peninsula of India and descend on the Arabian Ocean. I have sufficiently remarked in other places† on the irregularities which may and do take place in the wind circles when a Cyclone is in the neighbourhood of high land, so that I do not deem it necessary to repeat these observations here to shew that we cannot from the mere direction of the wind when so close in with the coast, ascertain correctly the bearing of the centre, especially when, as in this case, the body of the Cyclone is partly or wholly upon the land.

I take then the place of the centre at this time only, viz. daylight on the 18th, as the first positively well defined position for it, and we find that from this time to Noon of the 19th, she was scudding before it until compelled to heave to with the wind due South, blowing a Tyfoon; the vessel alternately heaving or broaching to, or bearing up to scud, as her distress allowed, nor did this vary till midnight of the 21st, when it fell calm.

\* "Forming or descending." My present theory is, (see *Sailor's Horn Book*,) that Cyclones are rarely if ever found at the surface of the earth, but in the atmosphere above, and that they descend in disk-like whirls to the surface of the land or ocean.

† See *Memoirs and Sailor's Horn Book*, p. 76.

The Barometer we find was on the 16th at 29.71, and had fallen to 29.39 at Noon of the 17th, and at 3 A. M. of the 18th, it was at 29.04 before and during the calm, and rose again to 29.29 at Noon, shewing that though the wind was rapidly veering from N. N. W. to West, by S. W. to South, and the vessel therefore in the Southern and Eastern verges of the calm centre, yet the Cyclone itself was travelling out to the Westward. On the 19th, the Bar. is noted as at 29.45, which shews, so far as the Barometer enables us to form any judgment when so near the centre, that for this day and a half, or two days, the Cyclone was running up with the ship, and its fall again from 29.45 at Noon to 29.25 at midnight of the 20th—21st shews also that it was again approaching the vessel and curving off to the Eastward past the South point of Formosa, so as to bring the *Easurain* again into the calm centre.

During this remarkable track the centre of the Cyclone must have been to the Westward of the ship throughout, and it must have been also travelling at a slow rate, since the vessel's drift when hove too was sufficient to keep the wind always about South, and it is only during her first run that she brought the wind as far as S. E.; her subsequent bearing up being only for about five hours at six knots per hour. We may infer however from this that the Cyclone was of some considerable extent, and its centre at some distance, for had it been small and the centre close, the wind would necessarily have been more variable, and its direction have altered quickly with the vessel's position within the storm circle. On this account then, I conceive that we cannot allow the centre to have been on an average at less than 75 miles to the West of the ship, giving to the whole Cyclone a diameter of 150 miles.

The track, as I have said before, must be one nearly parallel to the vessel's course and then curving rapidly over to the Eastward towards midnight, 21st,—22nd. Capt. Shire having carefully given on his Chart the position of the vessel at midnight as being in Lat.  $21^{\circ} 16'$ ; Long.  $120^{\circ} 38'$  we are enabled to estimate the rate of travelling of the Cyclone with some degree of accuracy, for as the distance from this point to daylight of the 18th, is about 270 miles in a strait line, with allowance for the curving of the storm as I have marked its track, we may call it 300 miles. This distance it took 90 hours, from 6 A. M. 18th to midnight of 21st,—22nd, to travel, so that its rate of progress did not exceed per hour 3.3 miles.

We come now to the calm of midnight 21st,—22nd, and the subsequent shift to the North, which is evidently that of a Cyclone *travelling to the Eastward*, and the wind is marked North to Noon of the 22nd, after which it became N. E. and the Barometer having risen to 29.76, we cannot consider this as any part of the Cyclone which no doubt passed off to the East and N. W., or was perhaps exhausted or lifted up, to judge of the comparative short duration of its Western side.

As this Cyclone, like that of the *Pluto's*, is an especially instructive one, I have placed the track of the ship from Capt. Shire's chart and that of the Cyclone as I have laid it down on the large Chart in a separate compartment, so as to enable the reader to study it with attention. The remarkable track of this Cyclone, as far as it relates to its nearly meridional course, we have an analogous instance of in the Eastern Hemisphere, in that of the *Cleopatra* as analysed in the Fifteenth of these Memoirs, and in the Western Hemisphere we have the Cyclones of the West Indies coming in from the Atlantic and curving off on the coast of North America, from the Floridas to Boston or Newfoundland, and then going off again into the Atlantic. Hence we must not be surprised that we have now found an instructive instance of this recurving near the Coast of China, though in a lower latitude than we might have expected. There are two or three other matters noticed in Capt. Shire's remarks on these Cyclones, which will deserve attention, and of these the first is the appearance of the atmosphere and land in the China Sea, which was so readily recognised by the residents of Singapore as the precursor of a Typhoon, and has long been known generally to be so. This note on the appearance of the horizon and the stars is worthy of much attention, for every sailor who is accustomed to night observations knows how rare a good horizon is, and that it often requires a keen eye and much practice to enable him to say he can conscientiously depend upon them.

The peculiar moaning noise to which I have referred in various of these Memoirs, was recognised by Capt. Shire, when in the calm centre of his first Cyclone. We have hitherto only known of it at the approach of the Cyclones, but there is no doubt it exists, and it furnishes thus a good warning sign.

Captain Shire furnishes us also with a very clear and remarkable example of the case to which I have elsewhere alluded of a ship being



instantaneously thrown by the shift of wind on her beam ends *against*, and with her deck towards the sea ; so as to be for a time and until the rain and opposing wind had somewhat abated the fury of the rollers (for that is the appearance the sea then takes) like a vessel on a reef, which has fallen over to seaward, and no seaman can doubt I think of the necessity of every precaution being taken to meet this fearful complication of dangers should it perchance arise.

The remarks on the effect of the sudden bursts of the squalls on the compasses are new\* and deeply interesting, inasmuch as they go far to shew that the Cyclones are purely electrical phænomena, though of this we want much more confirmation ; and I have little doubt that when attention of seamen is properly directed to the numerous signs and effects of Cyclones which have been hitherto unobserved or casually mentioned, or forgotten when the storm was over, we shall have a large harvest of novel and important facts. In the meantime every intelligent seaman, and every friend to science will I am sure join with me in expressing our great obligations to Capt. Shire for this addition to our knowledge.

#### TRACK U.

*Shanghae Typhoon, July, 1848.*

While preparing this Memoir for the press I received from Mr. A. R. Elliot, Master of H. M. S. *Childers*, a very full report on a Cyclone which passed over that place on the 18th July, 1848, and shortly before a letter from Commander J. C. Dalrymple Hay, of H. M. S. *Columbine*, with copy of a carefully kept meteorological register at Amoy from the 18th to the 25th of July, and some especially valuable remarks on the weather and appearances. From the first of these two documents we can estimate pretty nearly the track of this Cyclone, which is still farther to the North than any one we have as yet registered. Mr. Elliot's note, with some little abridgment, is as follows :—

*Notes on the Cyclone which passed over Shanghae on the 20th of July 1848, taken on board H. M. S. Childers, by A. R. ELLIOTT, Esq. Master, R. N.*

On Tuesday the 18th, fresh breezes and steady at S. E. (force of wind 5 to 6) B. C. Q. Barometer rather unsteady and falling from 29.73 at Noon to 29.68 at 6 P. M., where it remained until midnight ; wind at this time 4 ; B. C.

On Wednesday 19th, wind light and unsteady from S. E. to East 3; B. C.; at 6 A. M. Bar. 29.67; at noon E. S. E. 4; B. C.; Bar. 29.67. At 6 P. M. E. N. E. 5; B. C.; Bar. 29.66; between which and 8 P. M. the wind shifted to North 4; B. C.; at 11 N. by E. and at midnight N. E. 5; B. C. Bar. 29.59.

On Thursday 20th wind N. E. Fresh and squally, overcast and cloudy with drizzling rain. At 5 A. M. struck topgallant-masts; pointed yards to the wind. At 6 A. M. wind increasing with squalls; force wind 7; gloomy with drizzling rain.

At 6 A. M. wind N. E. 6 to 7	Bar. 29.47.	Struck topgallant-masts.
" 8 " " N. E. 6 to 7 Q	" 29.35.	Bent sheet cable, blowing very fresh in squalls.
" 8.50 " " E. N. E. 8	" " 29.33.	
" 9.15 " " E. N. E. "	" " 29.30.	Rain.
" 9.45 " " E. N. E. "	" " 29.27.	Struck lower yards and topmasts; blowing hard and looking very wild and threatening.
" 10.22 " " E. N. E. "	" " 29.23.	
" 11.00 " " E. N. E. "	" " 29.18.	
" 11.20 " " N. E. "	" " 29.14.	
" 11.50 " " " " "	" " 29.07.	Let go sheet anchor and veered half a shackle.
" 12.10 " " " " "	" " 29.00.	
" 12.38 " " " 9	" " 28.96.	Blowing hard force; 9 looking very wild the sky covered with murky clouds almost impervious with rain.
" 1.00 P. M. " N. E. by N. "	" " 28.88.	Blowing hard force 9.
" 1.50 " " E. N. E. "	" " 28.76.	Moderated suddenly, scarcely any wind, almost a Calm, looking finer. The country completely inundated; nothing to be seen but the houses and the trees standing out of the water: as it was low-water here to-day about 12-35, this enormous rise must have been forced up against the ebb, and is now at least 20 feet above low-water mark!
" 2.6 P. M. E. S. E. moderate.	28.76.	Wind came round to E. S. E. with sunshine and showers; country completely inundated.
" 2.20 " E. N. E. "	28.76.	Very little wind; light breeze, no rain.
" 2.40 " S. S. W. "	28.76.	Very light airs.
" 3. 6 " S. S. W. "	28.76.	Wind S. S. W., beginning to blow in puffs, no rain, looking very wild; Bar. having been stationary some time seems inclined to rise.
" 3.13 " S. W. by S. 7 Q.	28.76.	Blowing hard in puffs.
" 3.17 " S. S. W. 8 to 9	28.83.	Blowing hard in gusts and squalls, Bar. rising rapidly; looking very wild.
" 3.22 " S. S. W. "	28.86.	Bar. rising rapidly. Blowing hard in puffs, the tide falling very fast, although the stream of flood is running up strong, the wind from its present quarter forces it out of this river; high water this evening at 6-30 P. M.

„ 3.41 „	S. S. W.	„	28.91.	Blowing hard about force 9, in squalls. Tide falling fast, the wind since it shifted to the southward forcing it out of the river against the flood, as fast as the wind before had forced it up against the ebb.
„ 4. 5 „	S. W. by S.	„	28.99.	Blows harder in the puffs, but moderates more than it did (and for a longer period) between them, looking wild; water falling.
„ 4.19 „	S. S. W.	„	29.04.	Gusts less frequent with long lulls between them, when it is almost calm, sun just now shining out, weather gloomy and murky; scud flying rapidly from S. S. W.
„ 4.34 „	S. S. W.	„	29.07.	
„ 5.14 „	S. S. W.	5 to 6	29.13.	Blowing fresh in puffs.
„ 5.35 „	S. S. W.	„	29.17.	Blowing moderately fresh, but the same dark murky and almost impervious clouds, lighted here and there a little by the sun behind them, raining fast, becoming calm between the puffs.
„ 6.00 „	S. S. W.	Bar.	29.22.	Blowing fresh; about 5 force; cloudy with rain.
„ 6.20 „	S. S. W.	„	29.26.	Moderating to 4 force, with steady rain.
„ 6.40 „	„	„	29.29.	Dark and gloomy with fresh gusts and very heavy rain.
„ 7. 6 „	„	„	29.32.	Long intervals of little wind between the squalls, but they appear to increase in strength to 7; wind backed to south, looking very dirty with rain.
„ 7.10 „	South	„	„	
„ 7.17 „	South	„	29.34.	
„ 7.32 „	South	„	29.35.	
„ 7.40 „	South	„	29.37.	
„ 8.00 „	S. by E.	„	29.40.	Blowing hard (still) at times.
„ 8.22 „	S. S. E.	„	29.49.	Blowing hard at times.
„ 10. „	S. E. (G Q. P. 6 to 7)			
„ 12. „	S. E.	6 to 7	29.57.	
„ 21st at 6 A. M.	S. E. 3 B. C.		29.74.	
„ „ at Noon	S. S. E. 5 B. C.		29.70.	

High water at Shanghae on 20th, 6.30 P. M.

Ditto ditto at Woosung ditto 4.51 ditto.

During the swell of the tide, at the usual time of low-water, the tide was at least 20 feet above low-water mark.

From all I can learn, the mean of the lowest range of the whole of the merchant Ships' Barometers (at Woosung and this place) was 28.63, the lowest I hear of was 28.30 on board ship, and 28.10 on shore, and the Sympiesometer on board ship 27.55. Our's stood more than one tenth higher than the mean, but it has always been taken care of, and has during 2½ years' service, (in passages from England to Bahia, thence to Cape of Good Hope, and Mauritius, from thence to Hobart Town, and New Zealand and China,) never failed to give us timely warning in every respect, and we consider it a good one.

The only intelligence which has reached us yet, is that it was severely felt at Chusan and also at Ningpo, at the former place causing, through a tremendous inundation, the loss of many lives and much property; and that the country inland from this, has been deluged as far as Nanking, and no doubt the whole extent of the Yangtze river; at Woosung several ships lost, (through several large junks driving foul of them,) masts, bowsprits, anchors, and boats, and several junks were driven on shore.

The land about Chusan is bold and very high, and likewise all the Islands forming that group and archipelago, and also the entrance to the Ningpo river: the land hereabout, (with the exception of the Saddle Group in 30° 50' N. 122° 4' E. which lies off the entrance of the Yangtze Kiang, is all a low flat for a great extent inland, there being only a few solitary hills between this and Nanking.

Commander Hay's notes at Amoy are as follows, and when we recollect that Amoy is about 440 miles S. S. W. from Shanghae, we shall see that the Cyclone, coming up from the S. Eastward, was nearer to Amoy at 8 A. M. on the 20th, than when its centre reached Shanghae at 2 P. M. on that day.

“On 17th July an unusual fall took place in the Barometer, which reached its lowest point at 8 A. M. on the 20th July, without any bad weather. On that day the heat was very great, with clear weather; I ascended Nantai Washan hill, 1728 feet high, a haze to seaward prevented an extended view, but the sea was not much agitated. On the 21st the wind was strong and steady from N. E. Heavy banks of clouds rose over the land from the W. S. W. to W. N. W., and about sunset an extraordinary broom-like indigo-coloured cloud shot up behind them to an angle of about 35 from the zenith. To seaward a thick haze and apparently strong breeze.

22nd July, a heavy swell rolled into the harbour, and at sunset lightning to the S. W. over the land. At 8 P. M. a strong breeze from E. N. E. veering to the Northward, and to seaward heavy looking clouds, with incessant lightning E. by S. Lightning gradually drawing to the Northward; 11 P. M. lightning E. N. E. wind Northerly, 23rd at 8 A. M. wind blowing fresh at West, having come round gradually by the North during the night, and at 10 W. S. W. until 25th; much rain and variable winds, but on the 24th Southerly breezes obtained as before. On the morning of 23rd a dismasted junk came in, and the *Zephyr* Schooner having been at Namoa with a very low Barometer supposed bad weather must have occurred. The harbour of Amoy is seldom visited by typhoons, i. e. violent Cyclones, but there can be no doubt that their outer edge may occasionally graze this place.



Table of Barometer, Wind and Weather at Amoy, by Commander Hay.

Time.	Barometer.			Thermo- meter.		Wind Direc- tion.		Force Weather.		Wind Direc- tion.		Force Weather.		P. M. Weather.		Remarks.
	A. M.	P. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	A. M.	P. M.	
16	29.74	29.73	29.63	29.66	33 83 84 84	S. W. Calm North'y	S. W. Calm North'y	1-0-1	b. c. m. b. c.	S. E. ly—calm	S. E. ly—calm	3-2-0	b. c.			
19	29.72	29.63	29.72	29.51	33 83 84 83	Calm	Calm	0	b. c.	S. E. S. W. calm	S. E. S. W. calm	3-1-0	b. c.			
20	29.50	29.55	29.55	29.54	33 85 85 84½	Calm, S. East'y	Calm, S. East'y	0-2	b. c.	S. E.—calm	S. E.—calm	3-5-0	b. c. v.			
21	29.64	29.70	29.61	29.70	33 85 86 85	N. E.	N. E.	5-3 to 6	m. c. q. o m c q p	S. E. East	S. E. East	3-5	b. c. q.			Bar. 8 A. M.—29.40
22	29.72	29.66	29.58	29.62	34 86 37 86	N. N. E. North 4 W. N. W. West to 3	N. N. E. North 4 W. N. W. West to 3	4 to 6	q. b. c. o. q. c. r.	N. E. N. E. N. E.	N. E. N. E. N. E.	5-6-3	b. c. q. q. u. b. c. q. lu.			
23	29.60	29.45	29.36	29.54	34 83 83 83	S. East'y	S. East'y	5-4-3	o. u. r. r. o. q. o. c.	W. S. W. S. E.	W. S. W. S. E.	3 to 6	o. m. r. d. o. d. 3			
24	29.50	29.51	29.51	29.64	33 83½ 83 82	Calm, S. East'y	Calm, S. East'y	0-2-4	o. r. c. p.	S. E. East	S. E. East	2 to 3	b. c. o. g. o. c. p.			P. M. 29.36 low- point.
25	29.63	29.67	29.61	29.70	33 83½ 82½ 82	Calm, S. E. East	Calm, S. E. East	0-1-3	o. r. b. c. c. p.	S. E. Easterly.	S. E. Easterly.	4	b. c. o. q. r.			

From Mr. Elliot's note I estimate the main shift at Shanghai to have been, from N. E. when the force of the wind at 12 h. 38' is marked 9, to S. S. W. when it is marked, at 3 h. 17, at between 8 and 9, again; taking the intermediate veering as being but the incurvings at and near the centre. This will give a track from the S. E. b. E. to the N. W. b. W., or it may perhaps have been a little more Northerly, as we see the wind was much at E. N. E., but then supposing it would probably keep a strait course over the low inundated land at the mouth of the Yang size kiang, where there was nothing to deflect it, it would have veered after passing the ship, whereas it seems to have kept steady at about S. S. W., which inclines me to take the track I have named as not far from the truth.

## PART II.

## CYCLONES OF THE NORTHERN PACIFIC OCEAN.

Our data for the tracks of Cyclones in this part of the world are very few, but they are highly worth recording, as presenting two great points of interest. The first is their conformation to the general laws of progression and rotation for this part of the globe, and the second that of the tendency of the tracks to the Westward of the meridian within the tropics. We might indeed, to these two, add a third consideration, which is, that the day cannot be far distant when by means of steam from the Western coasts of North America this part of the ocean will become both for England and America a high road to China, and whenever this takes place, all knowledge relative to its Cyclones must have high value.

## TRACK V.

*Second Tyfoon of the H. C. S. DUKE OF BUCCLEUGH and fleet.*

The *Swift* Sloop of War, Captain Hayward, with a fleet of sixteen ships, of which 13 were the Hon'ble East India Company's China fleet of the season, left Macao Roads on the 15th June 1797, near the height of the S. W. moonson, and took, as usual in those days, when beating down the China Sea was thought an impossibility even for a man of war, the Eastern route by the Pacific Ocean. While yet within the Bashees on the 19th June, the fleet experienced a first severe Tyfoon, which separated it into two divisions which remained during the next two Tyfoons, 1st and 8th of July at such a moderate distance from each other (about 300 miles) that we are fortunately enabled to trace the tracks of these Cyclones to some distance and with much certainty.

My documents are first, Logs of the China Ships received from the India House, and next a copy of that part of the preface to Capt. Lynn's Star tables which describes the *Buccleugh's* distress. I have also had the advantage, for the Log of the *Canton*, of comparing it with that of Mr. Adamson, who was her chief officer.

As the fleet was separated into two divisions as above stated, and as the ships of each division were sufficiently near to their commodore to allow us to consider them as single ships, when the mean of their positions and winds are taken. I have, to economise details, put the Logs of the first division into the form of tables.

*Tabular extracts from the Logs of the 1st Division of the H. Co.'s China fleet in its 2nd Typhoon (in the Pacific Ocean) of July 1797, reduced to Civil Time.*

Date.	Ship's Name.	Position at Noon.		Average Position of body of the Fleet and average Wind Noon.	Winds and Weather.	Bar. & Ther.	Remarks.
		Lat. N.	Long. E.				
1st JULY 1797.	Duke of Buccleugh.	19° 4'	124.18		Noon squally N. N. W. P. M. strong gales N. N. W. Midnight about N. W. b. W.	29.06 84°	Ship running 8 and 9 knots to the S. E. till midnight, and making preparations for bad weather. Very hard squalls.
	Taunton Castle.	No obs.			Noon fresh gales and squally N. b. W.; 10 P. M. N. W. b. N.; 11, N. W.		Running to the S. E. strong gales and squalls with heavy rain.
	Cuffnells.	19° 3'	124.40*	19° 10' North, 124° 25' East. Noon N. N. W.	Noon squally; P. M. wind North, increasing fast; lightning to the S. W. 8 P. M. N. N. W. 10. Lightning to the West.	29.06 84½	Ship running with the fleet; strong gales threatening sky and high confused sea.

\* By Lunars.

Glatton.	No obs.	At midnight N. W.	Noon in 2d reefs; P. M. Wind North; heavy squalls and rain; 5 P. M. N. N. W.; midnight N. W. strong gale.	Running with the fleet; same weather.
Canton.	19° 20'	124.6	N. W. hard squalls, P. M. N. N. W. beginning to blow hard; towards evening increasing and drawing more Westerly; 6 P. M. one flash of lightning and thunder from the N. W.	This ship is noted as hull down to the Northward by the Taunton Castle, and as a bad sailer, the fleet being under topsails for her; she was running to the S. E. with the others but marking 7½ to 6¾ knots only.
Duke of Buccleugh.	Lat. N. 17° 15'	Long. E. 126° 21'	At 3 A. M. W. N. W. blowing a hurricane and remained so till noon; P. M. S. W. by W. Excessive heavy gusts to 10 P. M. Wind at S. S. W. when it moderated gradually as it came to the southward.	Alarming heavy sea; hove to at 6 A. M. Lost topmasts, &c. hove to with hammock cloths in the mizen rigging. P. M. lost tiller and all sails blown from the yards. Midnight moderating.
Taunton Castle.	Not given	126° 25. E. Wind Noon about S. W. Mid- night W. S. W. to S. S. W. ships being dis- posed over a circle of 30 miles in diameter.	At 2 A. M. W. N. W. hard gales and violent squalls; 7 A. M. S. W. P. M. still very strong but moderating to midnight, when wind about S. S. W.	Blowing very hard; impossible to look to windward; between 9 and 10 lost topmasts sprung mainmast and foreyard and at 7 A. M. hove to.

2D JULY



## 1st Division. Tabular Extracts Continued.

Date.	Ship's Name.	Position at Noon.		Average position of body of the fleet and average wind.	Winds and Weather.	Bar. and Ther.		Remarks.
		Lat.	Long.					
	Cuffnells.	17° 53'	126° 24'		2 A. M. Wind about W. b. S. 2 A. M. broached to, blowing a hurricane; 9 A. M. S. W. b. W.; 11 A. M. S. W. P. M. S. W. b. S. 7 P. M. S. S. W. 11, S. W. b. S.	28	77 78	Blowing very hard; $\frac{1}{2}$ past 4 A. M. lost topmasts, jibboom, foreyard, head of the mizen mast, &c. Noon abating, to midnight.
	Glatton.	Not given.			Midnight wind N. W. a hurricane, 5 A. M. about S. W. b. W. 9 W. b. S. Noon S. W. b. S. to midnight.			Broached to twice; 2 A. M. remained hove to, lost topmasts, &c. P. M. blowing so hard men could not go aloft; midnight moderating.
	Canton.	17° 45'	126° 31'		5 A. M. Wind W. N. W. 7 A. M. flew round to W. S. W. hurricane P. M. S. W. 5 P. M. W. S. W. decreasing to midnight and hauling to the South.			This ship ran on to 8 A. M. or 6 hours after the others in the shift W. N. W. to W. S. W., was hove round to North and had her decks swept; 11 A. M. main and mizen mast went; Noon lost rudder; 3 feet water in the hold.

On the 3rd July, the wind was gradually abating from midnight with all the ships, and the wind was hauling to the S. W. b. S. and South with them, according to their positions, which at Noon, when the weather was tolerably fine, were,

<i>Buccleugh</i> , .....	Lat. 17°26' N.	Long. ....	126°49' E.
<i>Taunton Castle</i> , .....	17°17' ..	.....	Not given.
<i>Cuffnells</i> , .....	18°19' ..	.....	127°05' ..
<i>Glatton</i> , .....	Not given,	.....	..
<i>Canton</i> , .....	17°46' ..	.....	126°30' ..

The whole of these ships, as will be noted, were now more or less in a disabled condition from broaching to when scudding to the S. E. across the South Western quadrant of the Cyclone, and we have seen that the *Canton*, which ran on to 8 A. M. had a partial shift, and her decks swept in consequence, and lost her rudder shortly after.

It was in this Cyclone, and doubtless between midnight and 8 A. M. that H. M. Sloop of war *Swift*, Capt. Hayward, with nearly 400 souls on board\* foundered! She was the Commodore, and had separated with this division of the fleet from the main body, and was scudding with them to the S. E., her top-light being last seen by the *Duke of Buccleugh* at midnight 1st,—2nd, and by the *Taunton Castle* at 1 A. M. on the 2nd, bearing S. b. W. from her. As Commodore she had no doubt up to that time, though at much risk, kept under such sail (or probably bare poles) as would enable her, with her superior sailing to the heavy Indiamen, to keep company, but as from that time forward the Cyclone was increasing in severity as the ships were nearing the centre, and the centre crossing near them, she must, to avoid being pooped, have carried any sail she could bear, and thus have run close in upon the centre before it crossed her track, or she may have seen the signals made by the Indiamen† when they broached or hove to and have broached to also, or been swamped or blown over in attempting to heave to herself. It is worth remarking that the partial shift of the wind with the *Canton* (W. N. W. to W. S. W.) is exactly an incurving of the wind such as I have elsewhere shewn‡ takes place close upon the centres of Cyclones. The *Swift* no doubt was ahead of the *Canton* the worst sailer in the fleet.

\* She had on board, besides her own complement, the officers and crew of H. M. S. *Providence* wrecked a short time previous on Typinshan.

† Signal to heave to is recorded in most of the Logs when they did so.

‡ Journal, Vol. XIV. p. 732, and Sailor's Horn Book.

I shall now give a brief summary of the Logs of the second division of the fleet, the body of which was on the 2nd at noon about 300 miles distant from the first division, but I do not give them in tables, for there are not sufficient differences to render this worth while; I note merely any remarkable circumstance. This second division consisted of ten ships, of which the logs of seven, viz. the H. C. Ships *Thames*, *Royal Charlotte*, *Alfred*, *Woodford*, *Henry Addington*, *Carnatic* and *True Briton*,\* are, by the attention of the Hon'ble the Court of Directors, as before acknowledged, before me; and I have very carefully compared them so as to detect any discrepancies or any particular notes which may appear in those which are the fullest and most attentively kept, and in this respect I must remark that we shall be specially indebted to the able log of Capt. W. Stanley Clarke of the *True Briton*, which is the model of them, and which while it affords us perhaps the earliest instance on record of a careful registry of the Barometer, gives us also in this case, through that care, the means of connecting to a great degree of accuracy the Cyclone of this division of the fleet with that of the first division, by measuring the distance of the centre by the rate of fall, in addition to the other evidence derived from the positions of the ships and the wind. At the distance of more than half a century it is not unpleasing to find that the principles of a new application of this valuable instrument are here available to aid us in researches of great interest, in a tract of ocean where our new science has been so little applied.

*Summary of the Logs of the Hon'ble Company's Ships THAMES, ROYAL CHARLOTTE, ALFRED, WOODFORD, HENRY ADDINGTON, CARNATIC and TRUE BRITON, forming the second division of the China fleet of July 1797.—Civil Time.*

On the 1st July, 1797, the fleet had the Botel Tobago Xima Islands bearing N. 18° East to N. 5' W. in 21° 47' N.; with light N. E. breezes and fair weather. The *True Briton's* Barometer, 29.63, Ther. 86½ at 6 P. M. by the bearing from the Commodore (the *Henry Addington*, Capt. Farquharson,) the fleet was in Lat. 21° 45' N.; Long. 122° 5' East; steering to the S. Eastward 5½ and 6 knots with the wind variable from N. b. E. to N. E. b. N., from 8 P. M. variable N. E. to North, an increasing breeze; 2nd reefs taken in; midnight wind

\* There were some Botany Bay ships (as traders to New South Wales were then called,) and others with the fleet.

about North, blowing strong, with squalls and lightning to the S. E., a confused swell since 4 P. M. The fleet at midnight was by acct. in Lat.  $21^{\circ} 21'$  N.; Long.  $122^{\circ} 38'$  East.

2nd July.—Midnight to Noon increasing to a strong gale with hard squalls; every preparation making for bad weather. At 8 A. M., wind N. b. W., to N. N. W. Noon N. b. W.; Lat.  $20^{\circ} 20'$  N.; Long.  $123^{\circ} 20'$ ; the fleet hove to at  $4\frac{1}{2}$  P. M. in Lat.  $19^{\circ} 49'$ ; N. Long.  $123. 33.$ ; P. M. wind N. N. W. 5 P. M. N. W.; 7 W. N. W. and W. b. N., and at midnight W. S. W. at  $4\frac{1}{2}$  P. M. fleet hove to by signal, being then in Long. E.; 11 P. M. *Henry Addington* lost her rudder, midnight blowing very heavy.

At 3 A. M. The *True Briton's* Barometer sunk 2-10ths of an inch. It is not said if *all at once*, or if this is the amount of fall since Noon of the 1st. It is further said that “at Noon (2nd) it is down at 29. 3, but it is marked at the foot of the log 29.5, and at 9 P. M. at 29.3, so that I presume 29.5 to have been an error of the copyists, and that it really was at 29.3 at Noon and 29.43 at 3 A. M., or 2-10ths below Noon of the 1st. At midnight the Barometer is marked at 29.2. I shall refer again to this Barometer register in deducing the track of this Cyclone.

3rd July.—A. M. wind veering from W. S. W., to S. S. W.; at 9 A. M. and Noon, when Lat.  $20^{\circ} 5\frac{1}{2}'$  N.; Long.  $123^{\circ} 46'$  East. P. M. wind S. b. W. at sunset and South at midnight, blowing very heavy to 4 P. M. when it moderated to midnight, after which the weather became fine.

### Remarks.

I commence these with the range of Capt. W. Stanley Clarke's Barometer in the *True Briton*, to which I have before adverted. It was at Noon 1st July, 29 63. Ther.  $86\frac{1}{2}^{\circ}$ .

3 A. M. 2nd July, had fallen 0. 2., therefore,.....	29.43.
Noon, .....	29.30.
9 P. M.,.....	29.30.
Midnight, .....	29.20.
3rd July, 3 A. M., .....	29.10.
8 A. M., .....	29.15.
11 A. M., .....	29.20.
Noon, .....	29.30.

Capt. Clarke adds :

“In the other column I have noted the fall *and* rise\* of the Marine Barometer, which proved a very true index of the weather, for between 3 and 4 o'clock

\* Shewing how new its application was at this time as a warning to seamen of the approach of tempests.



the gale was at its highest and it would be difficult to conceive a more furious one while it lasted; the Marine Barometer being rather below 29.1 at that time, which was its greatest fall; towards Noon the squalls slackened, though we had hard rain and very thick weather."

We have first to consider if the Cyclones of the first and second divisions of the Fleet were one and the same, and for this we must first consider their distance apart.

It appears that the 1st Division was on the 1st of July at Noon in the Western edge of its Cyclone, the wind (North to N. N. W.) in Lat.  $19^{\circ} 10'$  North;  $124^{\circ} 25'$  East', running to the S. Eastward till midnight the wind increasing in strength and being then at S. W. The position of the Division at this time was about  $18^{\circ} 03'$  N.; Long.  $125^{\circ} 15'$  E.; and at the same time, midnight, 1st and 2nd, we find that the 2nd Division was in Lat.  $21^{\circ} 21'$ ; Long.  $122^{\circ} 38'$ , or at a bearing and distance of N.  $37'$  W.; 250 miles from the 1st, with its Cyclone just commencing at North.

As the first Division had the wind at this time N. W., and was close upon the centre, we may say that the centre of their Cyclone was in about  $18^{\circ} 20'$ , N.  $125^{\circ} 30'$ , E. or thereabouts, which will give the bearing and distance between the Cyclone and the body of the 2nd Division as S.  $42^{\circ}$  East about 244 miles, which we may take as being about the semi-diameter of the Cyclone, making its diameter to be 488 miles, which, for a Pacific Ocean one, is not at all excessive.

If we look now at Captain Stanley Clarke's Barometer register, we find that between Noon and 3 A. M. it is noted to have fallen 2-tenths, which for the whole 15 hours would give a fall of 0.13 per hour, but it is evident that this fall must at least have taken place after sunset, since nothing is said about a falling Barometer at that time, when the first reefs were taken in. Hence we may fairly assume that it was a fall of at least 0.02 per hour,\* which would give an approximate distance of say 250 miles at midnight.

Now it appears from the logs of the second Division that the Cyclone was, as we have seen, bearing at midnight about S.  $42^{\circ}$  East 244 miles

\* In the next Cyclone in the Log of the *Buccleugh* of the 8th the Barometer is marked at Noon of the 7th at 29.27 and at Noon of the 8th, 28.55, and the remarks say:—"The barometer fell very fast towards Noon." We should evidently take an unfair average here if we assumed the fall to represent that of the 24 hours, when it probably took place in 12, or even in six hours.

from thence, and that they ran down to meet it to the S.  $40^{\circ}$  E. 112 miles, till they hove to at  $5\frac{1}{2}$  P. M., and that by the wind and the Barometer the centre was nearest to them at about 3 A. M. on the 3rd.

Hence, if from the 250 miles of distance we subtract this 122 miles of run there will remain 128 miles as the distance made by the Cyclone from midnight to 3 A. M., or in 27 hours, which will give an average of 4.8 miles per hour for its rate of travelling, which though slow is not an improbable one, for the Cyclone lasted nearly two days with both Divisions, and both ran across a part of it before heaving to.

It would seem that there is no sort of doubt that the two Divisions of the fleet experienced the same Cyclone, and as the Cyclone's centre bore from the 2nd division S.  $42^{\circ}$  East at midnight, and yet though that division made 94 miles of Southing in its run before heaving to it passed close to the Northward of it, we may take its track to have been about from S.  $40^{\circ}$  East to N.  $40^{\circ}$  West, and we may certainly mark its course on that track to have been upwards of 500 miles, since we have seen that its diameter alone could not have been much under that extent.

#### TRACK W.

*Third Tyfoon of the H. C. S. DUKE OF BUCCLEUGH and Fleet, 8th and 9th July, 1797.*

The fleet, as before described, remained separated into two divisions, which were about  $3\frac{1}{2}$  degrees apart, and indeed the second or sternmost division were so scattered that the more distant ships almost formed a third division, but I still continue to distinguish them as the first and second divisions, noting carefully, how the more Northerly ships escaped the Cyclone, of which the centre passed over the first or South East division, and was severely felt by the southernmost ships of the second division.

The first division were near enough together to allow us to consider them as one fleet, and take the centre of its position as that from which to calculate. This division consisted of the H. C. S. *Cuffnells*, *Duke of Buccleugh*, and *Taunton Castle*; the *Glatton* with the *Canton* in tow (which ship had lost her rudder and was dismasted) having separated from the fleet, and being  $2\frac{1}{2}$  to  $3^{\circ}$  to the Northward, did not feel this Cyclone except as a fresh breeze from the S. E. with a long swell from the South.

*Abstract summary of the Logs of the 1st Division, 7th July 1797.*—Noon, Lat.  $17^{\circ}21'$  N.; Long. Chr.  $126^{\circ}20'$  East; Bar. 29.27; Ther. 80, Wind N. E. by N. Confused swell and suspicious weather, moderate breeze, increasing P. M. to a hurricane at N. N. E. and N. b. E.; at midnight with a mountainous sea; under trysails and bare poles; 8 P. M. Bar. had fallen to 29.24. In the remarks I shall quote from the *Buccleugh's* Log is an instance of the Red Sky.

8th July, A. M. Wind N. E. b. E. Dark threatening weather and increasing gale with two ships; with *Buccleugh*, N. N. W., blowing a hurricane with hard varying gusts;\* Noon centre of the three ships which were at least 18 or 20 miles apart in Lat.  $17^{\circ}6'$ ; Long. 126.9; Bar. of *Cuffnells* and *Buccleugh*, 28.55. Ther.  $79^{\circ}$ ; 0.30 P. M. *Buccleugh's* Bar. sunk with the calm to 28.40. At 0.30 P. M. a calm, after which at about  $2\frac{1}{4}$  P. M. a shift of wind as follows:

*Cuffnells* N. E. to W. b. N. veering to S. S. E. at 5 P. M.

*Buccleugh* N. N. W. to S. S. W.

*Taunton Castle* N. b. W. S. S. W.

Blowing a hurricane again and hauling to southward towards midnight, with a confused sea; 9 P. M. Lightning in the S. E. Of the shift *Taunton Castle* says:—

“A little after noon the wind suddenly died away and the sea much down, but it was the shortest interval of moderate weather I ever knew after a hard gale, for in two hours, i. e. at 2 P. M. there came on such a violent storm that the oldest seamen on board said they never knew it blow so hard before.”

9th July.—From midnight decreasing somewhat to strong gales S. E. Noon Lat.  $17^{\circ}26'$  N.; Long.  $125^{\circ}5'$ . Bar. 29.08; Ther. 79; P. M. to midnight decreasing always from S. S. E. after which fine weather and Northerly wind, this division was hove to throughout this Cyclone, the *Buccleugh* having lost her rudder

#### *Abstract summary of the Logs of the 2nd Division.*

This Division consisted as before, of the ten East Indiamen and some Botany Bay ships, and from the last Cyclone had had moderate weather till on the 8th July, 1797, at Noon, when in  $18^{\circ}38'$  N.; Long.  $125^{\circ}33'$  East; the breeze which had been preceded by a swell from the S. E. and S. S. E. increased from the E. N. E. to a fresh gale E. b. N. with a high confused sea. The *True Briton's* Bar. which on the 7th at Noon was at 29.80, had fallen to 29.62; Ther.  $85^{\circ}$ ; and at 2 P. M., the fleet hove to till midnight.

9th July.—A. M. wind veering slowly to E. S. E. and by Noon to S. E. Fleet lying to with strong gale and high sea. At Noon Lat.  $18^{\circ}52'$ ; Long.  $125^{\circ}8'$  E.; *True Briton's* Barometer 29.40. At midnight wind was still about S. E. b. S.

\* Owing no doubt to the incurving of the wind close on the centre; and the difference of winds is what should occur with scattered ships but just in sight of each other at most.

10th July.—Moderating from the S. E. to noon, when in Lat.  $19^{\circ} 17' N.$ ; Long.  $124^{\circ} 40'$ . The *True Briton's* Bar. 29.50; Ther. 85.

#### REMARKS.

We have now, from the position of the two divisions, first to settle, as before, that they successively had the same Cyclone, and then to ascertain its track.

We find that the first Division, on the 7th July at Noon, when in Lat.  $17^{\circ} 21'$ , Long.  $126^{\circ} 20'$ , had the wind at N. E. b. N. a moderate breeze increasing at midnight to a hurricane at N. N. E., and on this day at Noon the bearing and distance of the second division from it was N.  $25^{\circ} W.$  157 miles. At midnight 7th,—8th, the second division had stood on about 30 miles to the S. Eastward, so as to make its distance at this time about 130 miles from the first division, which was lying to. The breeze was freshening at midnight with flying squalls and rain and a heavy sea, and the ships were reefing and (warned by the preceding Typhoon) striking topgallant yards and masts. We may take it then, that they were not far from the outer verge of the Cyclone, which at this time bore about S. E. from them (wind N. E.). It should be noticed that they continued to stand to the S. E. about 30 or 40 miles more before heaving to. At noon of the 8th, the first division had it blowing a hurricane, and they had their calm centre and subsequent shift of wind at about 0.30 P. M. We may thus take the position given for the fleet to have been also that of the centre, and it was in  $17^{\circ} 6' N.$ ;  $126^{\circ} 9' E.$  At this time the 2nd Division bore from it N.  $21^{\circ} W.$  99 miles by its position, and had the wind at between E. b. N. and E. N. E. increasing so rapidly that at  $2\frac{1}{2}$  P. M. they hove to. The *True Briton's* Barometer had fallen 0.18, but as it is only registered from Noon to Noon we cannot base any calculation upon it. If we take the true average of the wind to have been E. b. N.  $\frac{1}{2}$  N. this will give us the centre of the Cyclone as bearing S. b. E.  $\frac{1}{2}$  E. ( $S. 16^{\circ} E.$ ) and we have seen that by the estimated position of the two divisions (and that of the first division was of course merely an estimate and nothing more,) it bore S.  $21^{\circ} E.$  and if we take the distance to be 100 miles, the Cyclone was one of 200 miles only in diameter.

There can be no sort of doubt then that the two divisions experienced again the same Cyclone, which passed over the first division, and to the Southward of the second. Its track we may best deduce from the



shifts experienced by the first division, remembering that they were in different parts of the central calm space, from 15 to 20 miles or more in diameter, since the calm lasted about two hours.

We have then the different ships as follows, viz.

	Wind at	$\left\{ \begin{array}{l} \text{Shifted at about 2} \\ \text{P. M. after a lull} \\ \text{to W. b. N. veering} \\ \text{rapidly to S. S. E.} \end{array} \right\}$	$\left. \begin{array}{l} \text{Shewing a} \\ \text{track to the} \\ \text{W. b. N.} \end{array} \right\}$
	Noon		
Ship <i>Cuffnells</i> ,	N. E.		
<i>Buccleugh</i> ,	North	S. W.	W. N. W.
<i>Taunton Castle</i> ,	N. N. E.	S. S. W.	W. N. W.

which will give a track of about N.  $71^{\circ} 15'$  West, but as we find that the wind veered with the second division but slowly to the E. S. E. and S. E. we may allow the track to have been a little more to the Northward, and I estimate it to have been really about N.  $65^{\circ}$  W.

In the Log of the *Buccleugh* occurs a remarkable notice of the curious phenomenon, the red sky, which is evidently here, as in the China Sea and in the Southern Indian Ocean, a precursory sign of the Cyclones.\* The passage occurs in Mr. Lynn's notes, as follows:—

“At sunset the clouds predicted another severe typhoon; the appearance was that of remarkably large and dense clouds surrounding the horizon at an altitude of about 10 to 15 degrees, having their edges tinged with a deep crimson border, or if bound with a ribbon of that colour, and reflecting an awful redness on the sails, which appearance had also preceded the former gales, and which I shall ever conceive are certain indications of their approach; made every thing as snug as possible before night.”

#### TRACK X.

The *Buccleugh* experienced a fourth Typhoon, from the 16th to the 18th of July, which is entered as follows in Mr. Lynn's remarks:—

“On the 16th at Noon the *Cuffnells* made signal that the Bar. was again falling; immediately prepared for another typhoon, which commencing in the N. N. E. and veering in the same way exactly as the former ones to North N. N. W., N. W. and West, from thence to W. S., W. S. W. and South, when after two days' continuance of severe blowing it moderated. And we then observed in Lat.  $17^{\circ} 16'$  North; Long.  $128^{\circ} 14'$  East.”

\* While writing this I learn also that it is so too for the Bay of Bengal, and moreover, that it has occurred in two instances (Cyclone of October 1848, with the ship *Barham*, and Cylone of Oct. 1832 with the ship *Albion*) at night by moonlight!

This average of N. N. E. to South would, without allowance for the *Buccleugh's* drift, give a track to the W. b. N. I have no further logs of the other ships from which to ascertain if it reached them, and I have marked the track W. N. W. on account of the drift and as passing to the Northward and Eastward of the *Buccleugh's* position on the 18th, as it evidently did.

#### TRACKS Y AND Z.

*William IV.'s Tyfoons, July, 1845. Pacific Ocean and China Sea.*

The following newspaper notice is all I have met with on the subject of these Cyclones, which though of 1845, I have placed last as from the scantiness of the notice I cannot conveniently divide it, and the first Cyclone is a Pacific Ocean one, and the second very nearly so. We are enabled to mark pretty exactly the track of the first Cyclone, though as we do not know the vessel's rate of sailing, there is some uncertainty about its latitude. The second of them might almost be taken for a heavy monsoon, but the great fall of the Barometer and the excessive violence of the wind induce us to suppose that it was a true Cyclone, the ship being in its S. Eastern quadrant.

#### SINGAPORE.

*Calcutta Englishman, 1st Oct. 1845.*

“ We have been favoured by a friend with the perusal of a letter, from which we learn the following particulars respecting the damage received by the *William IV.*

On the 7th July 1845, the weather became threatening, and the Barometer fell considerably. They were then in Lat. 19.40. N., Long. 123. 10. E. A strong gale with heavy rain set in from the N. E. round to the N. W., and blowing in heavy gusts. The Barometer continued to fall to 28. 50. and preparations were made for a typhoon. At 10. a. m. the wind blew with such fury that it was impossible to stand on the deck without support, the sea blowing over the ship like a sheet of snow. In an hour the Barometer fell to 28.30. and during the day was as low as 28.20. At 11 the rudder head broke off and the ship broached to, carrying away the topmasts, jib-boom, fore-yard, starboard bulwarks, and quarter and stern boats. Fortunately no water was shipped on the weather side. Such was the force of the wind that the larboard quarter boat was blown to pieces. At 3 a. m. on the 8th, wind veered to S. S. W. and the mercury began to rise, but the fury of the typhoon did not cease until 4.30 a. m. At daylight the wind was S. S. E. and still violent. The larboard main chains were found nearly all broken.

At noon the gale moderated a little, but an awful sea was still running. The mainmast was however secured, and a small sail set on the stump of the main topmast. On the 9th there was a fresh gale from the S. E. but less sea, and the mercury rose to 29.10. They then steered for Hongkong to repair damages, but when about 350 miles distant, on the 11th, it commenced blowing a strong gale from S. S. E., which increased in violence veering to S. W., until 11 A. M. when it blew a perfect hurricane. The Barometer fell to 28.20; and they were obliged to throw the guns overboard, and cut away the mainmast, all the preventer tackles and shrouds being carried away, and from the motion of the vessel it was tearing up the deck and starting the beams. About two hours after, a heavy sea fell on board, which swept away all the larboard bulwarks from the fore channel to the gangway, leaving the foremast almost destitute of support. During the night of the 11th and morning of the 12th, their situation was extremely perilous, and at daybreak, they discovered they were not more than 4 miles from the breakers on the mainland of Formosa, a strong gale blowing from the S. S. W., and a mountainous sea running. All morning it had been blowing in severe squalls and thick rain, but cleared up for about half an hour enabling them to see their danger, when the rain again set in so close that they could scarcely see a cable's length. They were able to set a foresail and keep the ship off, and at 5 P. M., reached Lamyet. During the whole of the 12th a heavy gale blew from the S. S. W., and on the 13th there were continued gales with a high turbulent sea and constant rain. This night they lay to, to avoid being driven on the Pescadores. It cleared up at daylight of the 14th and the Eastern Islands were discovered. It again blew furiously with heavy squalls, and two of the jury sails were blown away. On the 15th there was a fresh gale from S. S. E. with a heavy sea, but a jury mainsail was got up which enabled them to make a better course, and Amoy was reached at 4 P. M. on the 16th. Five days had passed without their being able to cook any thing, and for nearly nine days they had not a dry suit of clothes to put on."—*Singapore Free Press*, Sept. 11th, 1845.

Considering the first of these Cyclones, we are a little embarrassed by the Lat. and Long. being given first, and its not being stated whether this is the estimated position when it began to blow heavily from the N. E., or that at noon which has been merely put down first? Taking the whole of the context however I incline to believe that, as it is said "they were *then* in Lat. &c." and that at 11 "she broached to," it is intended to express here that this position was that of about daylight, when the fall of the Barometer commenced, or say at 6 A. M., from which time, if we allow her to have run on her direct course (for she was I take it bound to England by the Eastern passage, since she ran

with the wind at N. E. till she plunged into the Cyclone, at N. W. (and indeed she could not heave to with Cape Engano only 70 miles under her lee) we may say that from 6 A. M. to noon she made at least 50 miles to the S. East, which would place her at noon in Lat.  $19^{\circ} 5' N.$  ; Long.  $123^{\circ} 37'$  with the wind at N. W. and the centre of the Cyclone consequently a short distance to the N. E. of her, since it veered at or by 3 A. M. to S. S. W. and shortly after to S. S. E. or 14 points in 15 or 16 hours. The average shift then was one of from N. W. to S. S. W. which indicates a track from the E. b. N. to the W. b. S.

In the second Cyclone we have only a vague position given, but the veering, if we allow it on the grounds I have before stated to have been a true Cyclone, is a very remarkable one, for it indicates a nearly meridional track, and one trending to the Eastward, or *from* the S. b. W. to the N. b. E. and I therefore note it here, though I can only mark it on the Chart conjecturally as follows.

If we take the ship to have made the best of her way towards Hong Kong from her last position, by running through the Bashee passage, she may have been on the 11th, say at noon, when 350 miles from Hong Kong, in Lat.  $20^{\circ} 50' N.$  ; Long.  $120^{\circ} 20'$  East, from which position the South point of Formosa lies about N. N. E. 70 miles.

We are at a loss to know if the ship ran any distance, or was only drifted during the whole of the 24 hours from about daylight 11th, to daylight on the 12th, when so near the rocks of Formosa, for any run would make the track of the Cyclone even farther to the Westward of the meridian than we can now venture to assign it, but as she was partly disabled she could scarcely venture to run far in such weather, and the drift she made is not an excessive one in a Cyclone. I have therefore set it down, at a venture, as a track from the S. S. W. to the N. N. E. meaning by this expression that I have no doubt, if the newspaper account be correctly printed\* that the track certainly did incline to the Eastward of the Meridian, but how much so we are uncertain, though from what we have seen it *may* have done so enough to pass to the Eastward of the South point of Formosa !

\* I cannot here, unfortunately, refer to the *Singapore Free Press* of 1845.



The following is a table of the tracks marked on the Chart for more convenient reference.

	Tracks.	Dates.
<b>A and B.</b>	<i>Golconda and Thetis,</i> .....	Sept. 1840.
<b>C.</b>	<i>Chusan,</i> .....	Sept. 1843.
<b>D.</b>	<i>Tung Hai, Cacique,</i> .....	.....
<b>E.</b>	<i>Atiet Rohoman and Shah Allum,</i> ..	Oct. 1843.
<b>F.</b>	<i>Manila,</i> .....	Oct. 1843.
<b>G.</b>	<i>Edmonstone,</i> .....	Nov. 1844.
<b>H I.</b>	<i>Pacific Ocean and China Sea, H. M. Str. } Driver, .....</i>	Oct. 1845.
<b>I i.</b>	<i>Ship Ann, &amp;c., Manila,</i> .....	Nov. 1845.
<b>J.</b>	<i>H. C. Steamer Pluto,</i> .....	June 1846.
<b>K.</b>	<i>Hydere,</i> .....	July 1846.
<b>L.</b>	<i>H. M. S. Ringdove,</i> .....	Sept. 1846.
<b>M.</b>	<i>H. M. S. Agincourt,</i> .....	Sept. 1846.
<b>N.</b>	<i>Mischief,</i> .....	Sept. 1846.
<b>O.</b>	<i>Don Juan,</i> .....	Sept. 1846.
<b>P.</b>	<i>Brig Guess,</i> .....	July 1847.
<b>Q.</b>	<i>H. M. Steamer Vulture,</i> ..	Nov. 1847.
<b>R.</b>	<i>Rob Roy and Swallow,</i> .....	Nov. 1847.
<b>S.</b>	<i>Rob Roy, Manila,</i> .....	Nov. 1847.
<b>T.</b>	<i>Easurain, Coast of Luconia and Bashee Passage,</i>	Nov. 1847.
<b>U.</b>	<i>H. M. S. Childers, Shanghai,</i> .....	July 1848.

#### PACIFIC OCEAN.

<b>V.</b>	<i>Duke of Buccleugh, and fleet,</i> .....	July 1797.
<b>W.</b>	<i>Ditto, .....</i> ditto, .....	ditto ditto.
<b>X.</b>	<i>Ditto, .....</i> ditto, .....	ditto ditto.
<b>Y Z.</b>	<i>King William IV.,</i> .....	July 1845.



PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL  
FOR MARCH, 1849.

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At a Meeting of the Asiatic Society held on Wednesday, the 7th March 1849,

The Right Rev. the LORD BISHOP, Vice President, in the Chair.

The proceedings of the February Meeting were read and confirmed, and the accounts and vouchers of the preceding month were laid upon the table.

The following gentlemen, proposed as members at the previous meeting, were ballotted for and duly elected.

*W. J. H. Money*, Esq. C. S.

*Capt. Bazely*, Bengal Artillery.

Read letters—

From Captain J. D. Cunningham, Political Agent, Bhopal, forwarding facsimiles of inscriptions from Oodeypore and Rahutgurh, on the Beena river.

From Charles Hufnagle, Esq. American Consul, forwarding a box of shells and a parcel of books presented to the Society by Henry Wheatland, Esq., Secretary to the Essex Institute, Massachusetts.

Read a letter accompanying these donations, in which Mr. Wheatland proposes correspondence and the exchange of objects of Natural History with the Asiatic Society. Referred to the Section of Natural History.

From Captain James Abbott, a note on certain remains of Greek Sculpture found at Potowar.

From Major Boileau, giving a sketch of a small fish that had been swallowed by a snake, and a drawing of the snake's head.

From Dr. Roer, Secretary Oriental Section, requesting the sanction of the Society to a proposal by Dr. Sprenger to publish a small pamphlet in Arabic on Shiite bibliography in the Bibliotheca. Sanctioned.

From Dr. Theodore Cantor, forwarding some remarks upon the Rev. Mr. Mason's Catalogue of Tenasserim land shells, by W. H. Benson, Esq., C. S.

Mr. Laidlay submitted a transcript of a Bactrian edition of the Edicts of Asoka copied by Captain Alexander Cunningham from a rock in the Yusufzye country. At the same time a letter from Capt. Kittoe was read enclosing a fragment of another inscription by the same Prince, but in the lát character, found by him at Sasseram.

A suggestion having been made that the Society should purchase a certain number of copies of Capt. Latter's Burmese Grammar, for presentation to the learned Societies and individuals with whom the Asiatic Society are in correspondence, it was resolved that the matter be referred for consideration and report to the Oriental Section.

On His Lordship the Vice President retiring, the Chair was taken by Dr. Lamb, when the Curators submitted their Reports.

J. W. COLVILLE, *President.*

J. W. LAIDLAY, *Secretary.*

#### LIBRARY.

The following books have been received since the last meeting.

#### *Presented.*

Archæologia: or Miscellaneous Tracts relating to Antiquity, published by the Society of Antiquaries of London. Vol. XXXII. 4to.—BY THE SOCIETY.

Upadesaka, No. 27.—BY THE EDITOR.

Oriental Baptist No. 27.—BY THE EDITOR.

The Calcutta Christian Observer for March, 1849.—BY THE EDITORS.

A Report on the Insects of Massachusetts, injurious to vegetation. Cambridge: 1841. 8vo.—BY THE LEGISLATURE OF MASSACHUSETTS.

Reports on the Fishes, Reptiles, and Birds of Massachusetts. Boston, 1839, 8vo.—BY THE SAME.

Report on the Invertibrata of Massachusetts, comprising the Mollusca, Crustacea, Annelida, and Radiata. Cambridge: 1841. 8vo.—BY THE SAME.

Reports on the Herbaceous Plants and on the Quadrupeds of Massachusetts. Cambridge: 1840. 8vo.—BY THE SAME.

Tatwabodhini Patriká, No. 67.—BY THE TATWABODHINI SABHA.

Journal of the Indian Archipelago. Vol. III. No. 1.—BY THE EDITOR.

Ditto, ditto (2 copies.)—BY THE GOVERNMENT OF BENGAL.

Memoir, Geographical, Political, and Commercial, on the present state, productive resources, and capabilities of commerce, of Siberia, Manchuria, and the Asiatic Islands of the Northern Pacific Ocean, and on the importance of opening commercial intercourse with those countries, &c. by A. H Palmer.  
—BY THE STATE OF NEW YORK.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of January, 1849.—BY THE DEPUTY SURVEYOR GENERAL.

Map of the district of Pooree or southern Division of Cuttack.—BY THE GOVERNMENT OF BENGAL.

An Analytical Digest of all the reported cases decided in the Supreme Courts of Judicature in India, in the Courts of the Honourable East India Company and on appeal from India, by her Majesty in Council. By W. H. Morley. Part IV. of Vols. I. and II.—BY THE SAME.

*Exchanged.*

The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, No. 221.

Journal Asiatique, No. 55, for June, 1848

*Purchased.*

Atlas to Alison's History of Europe, parts XX. and XXI.

Journal des Savants, for October, 1848.

The Zoology of the Voyage of H. M. S. Sulphur, Nos. IX. and X.

Comptes Rendus Hebdomedaires des Seances de l' Academie des Sciences. No. 18, for October, 1848.

*Donation to the Museum.*

From Bábu Rájendra Mallika. A group of terracotta figures, representing the manner in which thugs strangle their victims.









# Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of March, 1849.

Lat. 22° 33' 28". 33 N. Long. 88° 23' 42". 84 East. Mag. Variation 2° 28' 36" East. Mag. Dip. 27° 45'.

Days of the Month.	Observations made at sunrise.						Maximum Pressure observed at 9h. 50m.						Observations made at apparent noon.						Observations made at 2h. 40m.						Minimum Pressure observed at 4 p. m.						Observations made at sunset.						Maximum and Minimum Thermometer.				Rain Gauges.		Days of the Month.
	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Maximum.	Mean.	Minimum.	Maximum in sun's rays.	Elevations.								
		Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.							Of the Mercury.	Of the Air.	Of Wet Bulb.	Of the Mercury.	Of the Air.	Of Wet Bulb.	Of the Mercury.	Of the Air.	
1	Inches 29.974	65.2	65.8	64.8	S.	Clear.	Inches 30.022	78.0	78.8	73.2	S. S. W.	Clear.	Inches 29.959	86.8	86.6	74.3	S. W.	Clear.	Inches 29.901	88.9	88.2	69.3	S. W.	Clear.	Inches 29.892	87.9	86.6	73.0	S.	Cumuli.	Inches 29.914	82.7	82.2	70.9	S.	Clear.	Inch. 90.2	78.1	66.0	109.3	Inch.	Inch.	1
2	29.979	71.9	72.0	71.0	S. S. W.	Cloudy.	29.996	81.6	81.5	75.1	W.	Ditto	29.990	89.9	89.0	73.0	W.	Ditto	29.900	89.9	89.0	73.0	W.	Ditto	29.890	89.8	88.3	71.2	N. W.	Clear.	29.928	84.4	81.5	72.5	N. N. W.	Ditto	90.3	80.3	70.2	112.0	..	..	2
3	29.979	71.9	72.0	71.0	S. S. W.	Cloudy.	30.039	79.8	80.3	75.2	S. S. W.	Cumuli.	29.990	88.0	88.0	74.0	S.	Ditto	29.908	91.3	90.8	75.3	S. W.	Ditto	29.898	90.9	89.9	72.2	S.	Ditto	29.915	85.5	84.5	69.3	S.	Ditto	92.3	82.3	72.0	107.6	..	..	3
4	30.002	71.0	71.4	69.9	N.	Clear.	0.073	79.0	79.3	71.5	N. W.	Clear.	30.039	87.2	87.3	73.8	W.	Ditto	29.944	92.4	91.8	70.9	N. W.	Ditto	29.925	93.3	91.7	69.5	N. W.	Ditto	29.933	87.3	84.2	72.3	W.	Ditto	94.0	82.8	71.5	116.4	..	..	4
5	29.969	68.8	68.8	65.3	N. N. W.	Ditto	0.035	81.0	81.4	71.8	N. N. W.	Ditto	29.972	88.0	87.3	70.0	N. W.	Ditto	29.873	90.8	90.0	68.7	N. W.	Ditto	29.854	91.2	90.2	67.6	W.	Ditto	29.855	86.0	84.3	69.8	S. S. E.	Ditto	92.0	80.5	69.0	112.9	..	..	5
6	29.915	65.3	65.3	61.8	W. N. W.	Ditto	29.988	80.3	81.9	67.9	N. N. W.	Ditto	29.941	89.0	88.8	66.3	N. W.	Ditto	29.858	91.7	91.3	67.8	W.	Ditto	29.837	91.7	90.2	66.3	S. W.	Ditto	29.836	87.5	85.3	68.0	S. W.	Ditto	93.5	79.8	66.0	117.0	..	..	6
7	29.901	68.2	68.3	65.8	W. N. W.	Ditto	29.946	80.3	81.2	70.1	W. S. W.	Ditto	29.916	90.7	90.5	68.6	W. N. W.	Ditto	29.847	93.3	92.3	68.2	N. E.	Ditto	29.815	93.7	92.0	67.9	W. S. W.	Ditto	29.818	87.6	86.0	68.4	S. W.	Ditto	94.9	81.7	68.4	117.8	..	..	7
8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	8		
9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9		
10	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	10		
11	29.949	70.0	70.0	69.0	N. W.	Foggy.	30.017	80.6	81.0	73.8	N. W.	Clear.	29.975	88.9	88.2	70.9	N. W.	Cumuli.	29.908	90.3	89.8	70.5	W. S. W.	Clear.	29.895	90.0	88.5	67.2	W.	Clear.	29.905	83.9	82.0	71.0	N. W.	Clear.	91.1	80.7	70.2	109.8	..	..	11
12	29.910	68.8	68.3	64.1	S. W.	Clear.	29.965	82.3	83.0	68.0	W.	Ditto	29.908	90.9	90.7	69.4	W.	Clear.	29.822	93.9	92.9	68.3	N. W.	Ditto	29.805	94.0	92.6	68.3	W. N. W.	Ditto	29.812	87.8	85.0	72.8	W. N. W.	Ditto	95.1	82.2	69.3	114.8	..	..	12
13	29.865	71.4	71.5	70.2	S. W.	Ditto	29.917	83.2	83.4	74.9	S. W.	Ditto	29.877	91.4	91.2	75.7	W. S. W.	Ditto	29.804	95.8	95.7	74.1	W.	Ditto	29.783	96.5	95.2	73.3	W. S. W.	Ditto	29.802	90.0	88.7	76.7	S.	Ditto	97.4	84.6	71.7	118.3	..	..	13
14	29.840	72.8	72.8	69.0	S. W.	Cirro cumuli.	29.905	83.9	84.2	75.3	S. W.	Ditto	29.871	93.8	93.6	71.0	N. W.	Ditto	29.782	97.7	96.9	73.3	W. S. W.	Ditto	29.777	97.8	96.3	72.7	W.	Ditto	29.778	91.0	90.0	75.5	S. W.	Cloudy.	98.9	85.8	72.7	122.0	..	..	14
15	29.846	75.2	75.2	74.8	N. W.	Foggy.	29.926	86.8	86.9	66.0	N. N. W.	Cumuli.	29.905	92.0	91.4	67.3	N. N. W.	Ditto	29.835	94.9	93.7	69.0	N. W.	Ditto	29.820	95.4	93.3	69.3	N. N. W.	Ditto	29.832	89.5	87.0	72.0	W.	Clear.	96.6	86.2	75.7	119.4	..	..	15
16	29.959	70.5	70.7	67.7	W. S. W.	Clear.	30.032	85.2	85.2	66.2	N.	Clear.	29.998	90.9	90.3	66.3	N. N. W.	Ditto	29.923	93.4	92.2	67.0	N. W.	Ditto	29.909	94.0	92.3	67.8	W.	Ditto	29.913	87.7	85.0	68.9	W. S. W.	Cirro.	95.3	83.3	71.2	118.5	..	..	16
17	29.989	72.8	72.8	71.2	W. N. W.	Cirro strati.	29.940	82.3	81.9	75.7	W.	Ditto	29.902	89.8	89.5	72.4	S. W.	Ditto	29.891	92.8	92.0	72.8	S. W.	Ditto	29.891	93.0	91.7	70.7	S. W.	Ditto	29.900	88.2	87.0	72.7	S. W.	Cirro strati.	94.0	83.5	73.0	110.8	..	..	17
18	29.933	72.9	73.8	73.3	S. W.	Foggy.	29.961	84.3	83.5	76.7	W. S. W.	Ditto	29.928	90.0	89.8	70.3	S. W.	Ditto	29.825	94.0	93.0	70.4	S. W.	Ditto	29.807	93.7	92.5	69.7	W. S. W.	Cirro.	29.809	87.3	85.4	71.5	W. S. W.	Ditto	94.8	83.8	72.8	115.0	..	..	18
19	29.830	74.2	74.2	68.3	W. S. W.	Cloudy.	29.903	79.4	79.3	64.3	N. W. sh.	Cloudy.	29.897	80.0	79.6	65.0	N. W.	Cloudy.	29.840	71.5	68.6	64.0	N. W.	Rainy.	29.812	68.2	68.8	65.0	N. W.	Cloudy.	29.833	67.0	65.9	63.8	N. N. W.	Rainy.	80.8	77.4	74.0	87.5	0.26	0.34	19
20	29.864	65.6	65.7	63.8	S. W.	Ditto	29.918	76.4	76.4	68.7	S. W.	Clear.	29.858	83.3	83.4	70.0	S. W.	Cumuli.	29.810	82.9	81.9	71.3	S. W.	Cloudy.	29.793	72.2	69.4	63.7	S. E.	Ditto	29.809	72.7	72.0	63.7	E. S. E.	Cumulo strati.	86.4	75.8	65.2	96.6	1.08	1.16	20
21	29.875	67.7	68.8	67.7	N. N. W.	Ditto	29.911	81.0	81.0	74.0	S. W.	Cloudy.	29.874	85.7	85.6	74.7	S. W.	Cumulo strati.	29.822	83.2	82.8	75.6	E.	Cumulo strati.	29.833	79.9	78.9	73.3	E. S. E.	Ditto	29.840	76.5	74.4	70.9	E. S. E.	Cloudy.	88.2	75.1	69.0	107.0	0.16	0.21	21
22	..	..	..	..	..	..	..	..	..	..	..	..	29.933	87.0	85.2	77.0	S. S. E.	Ditto	29.893	90.0	89.0	79.8	S. S. W.	Cumulo strati.	29.776	90.0	89.0	79.8	S. S. W.	Cumulo strati.	29.753	89.3	88.0	79.0	S. W.	Cumulo strati.	91.4	80.7	70.0	..	..	..	22
23	29.878	75.3	75.7	74.4	S. S. E.	Cumuli.	29.905	84.0	83.9	76.9	S. S. W.	Cumulo strati.	29.869	87.0	86.4	77.5	S. W.	Ditto	29.776	90.0	89.0	79.8	S. S. W.	Cumulo strati.	29.753	89.3	88.0	79.0	S. W.	Cumulo strati.	29.727	87.6	86.9	78.5	S.	Generally clear.	90.7	83.2	75.6	107.5	0.08	0.14	23
24	29.832	74.0	74.5	73.4	E. S. E.	Cumulo strati.	29.885	84.0	82.8	77.5	S. S. W.	Ditto	29.833	88.5	8																												





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*On the Snow-line in the Himálaya ; by Lieut. R. STRACHEY, Engineers. Communicated by order of the HON'BLE THE LIEUT.-GOVERNOR, North Western Provinces.*

The height at which perpetual snow is found at different parts of the earth's surface, has become an object of enquiry, not only as a mere physical fact, but as a phenomenon intimately connected with the distribution of heat on the globe. In M. Humboldt's efforts to throw the light of his knowledge on this question, he has, when treating of the Himálaya, been unfortunately led much astray by the very authorities on whom he placed most reliance ; and his conclusions, though in part correct, cannot lay claim to any pretension to exactness. That he was indeed himself conscious of the deficiencies in the evidence before him, is manifest from his ending his disquisition by a declaration, that it was necessary, "de rectifier de nouveau et par des mesures bien précises dont tout le détail hypsométrique soit publié, ce qui reste de douteux sur la hauteur comparative des deux pentes de l' Himalaya, sur l' influence de réverbération du plateau tibétain, et sur celle que l'on suppose au courant ascendant de l'air chaud des plaines de l'Inde. C'est un travail à recommencer" (*Asie Centrale*, T. 3, p. 325). Men of science will still long have to regret that this illustrious traveller was prevented from visiting the east ; Englishmen alone need remember that he was prevented by them.

The result of M. Humboldt's investigations on the position of the snow line in this part of the Himalaya is thus given by himself :—"The



limit of perpetual snow on the southern declivity of the *Himálaya* chain is 2030 toises (13,000\* feet English) above the level of the sea ; on the northern declivity, or rather on the peaks which rise above the Tartarian plateau, this limit is 2600 toises (16,600 ft.), from  $30\frac{1}{2}$  to  $32^{\circ}$  of Latitude, while under the equator in the Andes of Quito it is 2470 toises (15,800 ft.). I have deduced this result from the collection and combination of many data furnished by Webb, Gerard, Herbert, and Moorcroft. The greater elevation to which the snow line recedes on the Thibetian declivity is the result conjointly of the radiation of heat from the neighbouring elevated plains, the serenity of the sky, and the infrequent formation of snow in very cold and dry air'' (*Cosmos. Trans.* T. 1. p. 363. Note 5).

The portion of the *Himálaya* to which allusion has most generally been made, in treating of the snow line, is that which lies between the north-western frontier of Nipál and the river Sutlej, and it is solely to this part of the chain that my remarks are intended to apply. It extends from about the 77th to the 81st degree of east longitude, and its entire breadth, from the plains of India on the south, to the plains of Tibet on the north, is about 120 miles. The mountains on which perpetual snow is found, are confined within a belt of about 35 miles in width, running along the northern boundary of the chain, and they all lie between the 30th and 32nd degree of north latitude.

If we now examine the structure of the mountains more closely (vide sheets 47, 48, 65, and 66 of the Indian Atlas), we shall find that from the sources of the Touse, (Long.  $78^{\circ} 30'$ ), to those of the Káli (Long.  $81^{\circ} 0'$ ), a space which includes the provinces of Garhwál and Kumaon, all the great rivers, viz. the Bhágirati, Vishnú-ganga, Dauli (of Niti), Gori, Dauli (of Darma) and Káli, run in directions not far from perpendicular to the general direction of the *Himálaya*. Further, that they are separated one from another by great transverse ranges, on which all the highest of the measured peaks of this region are to be found. It will also be seen that the sources of these rivers† are in the main watershed of the chain, beyond which a declivity of a few miles leads directly

\* The reduction of toises into English feet is every where given to the nearest hundred only.

† I mean the most distant sources of the tributaries, for several of the rivers that I have mentioned, *nominally* end in glaciers to the south of the water-shed.

to the plains of Tibet. A line drawn through the great peaks will be almost parallel to the water-shed, but about 30 miles to the south of it.

To the west of the Touse the arrangement of the drainage is very different. From the source of this river an unbroken ridge extends to the Sutlej, almost on the prolongation of the line of the great eastern peaks, but more nearly east and west. On this range, which separates Kunáwar from the more southern parts of Bissehir, and which, as it has hitherto received no distinctive name, I shall call the Bissehir range, are the Rúpin, Gunás, Burendo and Shátúl passes; and no perpetual snow is to be found further south among these western mountains. To the north of this range and almost parallel to it, run several others of somewhat greater altitude, between which the streams of eastern Kunáwar flow into the Sutlej, from S. E. to N. W., nearly parallel to the upper, and perpendicular to the lower part of the course of that river.

If we now follow two travellers into Tibet, one from Kumaon or Garhwál, and the other from Simla or the western hills, we shall be prepared to find that the circumstances under which they will cross the snowy mountains will be very different. The former will proceed up the course of one of the great rivers before alluded to, and ascending the gorge, by which it breaks through the line of the great peaks, will pass unobserved the true southern limit of the perpetual snow; he will leave the great peaks themselves far behind him, and will finally reach the water-shed of the chain, where he may possibly for the first time find glaciers and snow. He will here cross straight into Tibet, from what will appear to him the *southern*, to what he will call the *northern declivity* of the Himálaya.\*

The western traveller, on the other hand, will find almost at his first step a snowy barrier drawn across his path, and he will naturally suppose that he crosses from the southern to the northern face of the snowy range, when he descends from the Shátúl or some neighbouring pass into the valley of Kunáwar; and in this idea he will probably be confirmed, by the total change of climate which he will perceive, and by his being able to penetrate to Shipke, the frontier village of Tibet in this quarter,

\* This does not exactly apply to the passes usually crossed between Juhár and Tibet, which will be mentioned more particularly hereafter. There is a pass however, the 'Lashar,' though from its badness it is not used, which affords a direct communication.

without meeting any further obstacle on his road at all comparable to that he has passed, or perhaps even without again crossing snow.\*

Without waiting to enquire whether either of our travellers has in fact come to a just conclusion, it will be sufficient for my purpose to point out that they mean totally different things by their north and south declivities; and it will be indeed surprising if they agree as to the position of the snow line. It is manifest therefore that before we can expect to arrive at any correct results, we must get rid of the confusion caused by the ambiguity of the terms *north* and *south declivity*; terms which at the best are very ill adapted to convey definite ideas of position in so vast and complicated a mass of mountains. In spite of every care, they will constantly be liable to misconception, as must always be the case where a restricted signification is arbitrarily applied, in a discussion of this sort, to expressions which of themselves have an extended general meaning.†

As a substitute for the *declivities* then, the best standard that occurs to me, to which to refer when alluding to the elevation of the snow-line at any place, is the general mass of perpetual snow found on the more elevated parts of the Himálaya, *the belt of perpetual snow*, which as I before stated, is about 35 miles in breadth, and runs along the northern boundary of the chain. Instead of the height of the snow-line *on the northern or southern declivity*, I shall therefore say, the height *at the northern or southern limit of the belt of perpetual snow*, where *the limits of the belt of perpetual snow*, are to be understood as having exactly the same relation to the snowy surface in a *horizontal plane*, that *the snow-line* has in a *vertical*.

It remains for me to define clearly what is meant by *the snow-line*, and I cannot do better than adopt the words of M. Humboldt, who says, "the lower limit of perpetual snow in a given latitude is the boundary line of the snow which resists the effect of summer; it is the highest elevation to which the snow-line recedes in the course of the whole year. We must distinguish between the limit thus defined, and three other phenomena; viz. the annual fluctuation of the snow-line; the phenomenon of sporadic falls of snow, and the existence of glaciers" (*Cosmos. Trans. T. 1. p. 327*).

\* The ordinary route lies up the bank of the Sutlej.

† As a specimen, vide Capt. Hutton's papers noticed hereafter.

Having disposed of these preliminaries, which are essential to the proper apprehension of the subject, I shall proceed to examine the data from which the elevation of the snow-line is to be determined. In doing this it will I think be more convenient for me, both for the northern and southern limits, to explain first my own views, and afterwards to follow M. Humboldt's authorities, and point out the errors into which they have fallen.

1. *Southern limit of the belt of perpetual snow*.—In this part of the *Himálaya* it is not, on an average of years, till the beginning of December, that the snow-line appears decidedly to descend for the winter. After the end of September indeed, when the rains are quite over, light falls of snow are not of very uncommon occurrence on the higher mountains even down to 12,000 feet; but their effects usually disappear very quickly, often in a few hours. The latter part of October, the whole of November, and the beginning of December, are here generally characterised by the beautiful serenity of the sky; and it is at this season, on the southern edge of the belt, that the line of perpetual snow is seen to attain its greatest elevation.

The following are the results of trigonometrical measurements of the elevation of the inferior edge of snow on spurs of the *Tresúl* and *Nanda-devi* groups of peaks, made before the winter snow had begun in November, 1848.\*

Point observed.	Height as observed on face exposed to the East.			Height on face exposed to West observed from Almorah.
	From Almorah, (height 5586 ft.)	From Binsar, (height 7969 ft.)	Mean.	
No. 1.	16,599 feet.	16,767 feet.	16,683 feet.	15,872 feet.
2.	16,969	17,005	16,987	
3.	17,186	17,185	17,185	14,878
4.	15,293	15,361	15,327	

\* These measurements make no pretension to accuracy, but are sufficiently good approximations for the purpose for which they are intended. The heights are given as calculated from observations made both at Almorah and Binsar, to show in some degree what confidence may be attached to them. The heights of Almorah and Binsar are, on the authority of Capt. Webb's survey; the distance of these places, which is used as the base from which to calculate the several distances of the points observed, was got from a map of trigonometrically determined stations obtained from the Surveyor General's office.



The points 1, 2, and 3, are on ridges that run from the peaks Nos. 11 and 12, in a S. Westerly direction. The dip of the strata being to the N. East, the faces exposed to view from the south are for the most part very abrupt, and snow never accumulates on them to any great extent. This in some measure will account for the height to which the snow is seen to have receded on the eastern exposures, that is upwards of 17,000 feet. On the western exposures the ground is less steep, and the snow is seen to have been observed at a considerably less elevation; but it was in very small quantities, and had probably fallen lately, so that I am inclined to think that its height, viz. about 15,000 feet, rather indicates the elevation below which the light autumnal falls of snow were incapable of lying, than that of the inferior edge of the perpetual snow. It is further to be understood, that below this level of 15,000 feet, the mountains were *absolutely without snow*, excepting those small isolated patches that are seen in ravines, or at the head of glaciers, which of course do not affect such calculations as these. On the whole therefore I consider that the height of the snow-line on the more prominent points of the southern edge of the belt, may be fairly reckoned at 16,000 feet *at the very least*.

The point No. 4 was selected as being in a much more retired position than the others. It is situated not far from the head of the Pin-dur river, and lies between the peaks Nos. 14 and 15. It was quite free from snow at 15,300 feet, and I shall therefore consider 15,000 feet as the elevation of the snow-line in the re-entering angles of the chain.

I conclude then, that 15,500 feet, the mean of the heights at the most and least prominent points, should be assigned as the mean elevation of the snow-line at the southern limit of the belt of perpetual snow in Kumaon, and I conceive that whatever error there may be in this estimate, will be found to lie on the side of diminution rather than of exaggeration.

This result appears to accord well with what has been observed on the Bissehir range. The account given by Dr. Gerard of his visit to the Shátúl pass on this range, which he undertook expressly for the purpose of determining the height of the snow-line, contains the only definite information as to the limit of perpetual snow at the southern edge of the belt, that is to be found in the whole of the published writings of the Gerards; and the following is a short abstract of his obser-

ventions. Dr. Gerard reached the summit of the Shátúl pass, the elevation of which is 15,500 feet, on the 9th August 1822, and remained there till the 15th of the same month. He found the southern slope of the range generally free from snow, and he states that it is sometimes left without any whatever. On the top of the pass itself there was no snow; but on the northern slope of the mountain it lay as far down as about 14,000 feet. On his arrival rain was falling, and out of the four days of his stay on the pass, it either rained or snowed for the greater part of three. The fresh snow that fell during this time did not lie below 16,000 feet, and some of the more precipitous rocks remained clear even up to 17,000 feet.\*

The conclusion to which Dr. Gerard comes from these facts is, that the snow-line on the southern face of the Bissehir range is at 15,000 feet above the sea. But I should myself be more inclined from his account to consider that 15,500 feet was nearer the truth; and in this view I am confirmed by verbal accounts of the state of the passes on this range, which I have obtained from persons of my acquaintance, who have crossed them somewhat later in the year. The difference however is after all trifling.

Such is the direct evidence that can be offered on the height of the snow line at the southern limit of the belt of perpetual snow, some additional light may however be thrown on the subject generally, by my shortly explaining the state in which I have found the higher parts of the mountains, at the different seasons during which I have visited them.

In the beginning of May, on the mountains to the east of the Rám-ganga river, near Námik, I found the ground on the summit of the

\* *Tours in the Himalaya*, T. 1. pp. 289-347. M. Humboldt apparently interprets Dr. Gerard a little too literally, when, with reference to Dr. G.'s statement, that "Hans Bussun," a peak said to be 17,500 feet high, "had lost all its snow" and looked "quite black and dreary," he asks, "Quelle pent être la cause d'un phénomène local si extraordinaire?" (*Asie Centrale*, T. 3. p. 318, *note*.) The extreme summit of the peak of Nandádevi, which appears to be a perfect precipice for several thousand feet, is often in much the same predicament of 'black and dreary,' and many people are disappointed with its appearance for this reason, contrasting it with the beautiful pyramidal peak of No. 19 of Páñch-chúli, which is always entirely covered with the purest snow.

ridge called Champwá, not only perfectly free from snow at an elevation of 12,000 feet, but covered with flowers, in some places golden with *Caltha* and *Ranunculus polypetalus*, in others purple with *Primulus*. The snow had in fact already receded to upwards of 12,500 feet, beyond which even a few little *Gentians* proclaimed the advent of spring.

Towards the end of the same month, at the head of the Pindur, near the glacier from which that river rises, an open spot on which I could pitch my tent could not be found above 12,000 feet. But here the accumulation of snow, which was considerable in all ravines even below 11,000 feet, is manifestly the result of avalanches and drift. The surface of the glacier, clear ice as well as moraines, was quite free from snow up to nearly 13,000 feet; but the effect of the more retired position of the place in retarding the melting of the snow, was manifest from the less advanced state of the vegetation. During my stay at Pinduri the weather was very bad, and several inches of snow fell; but excepting where it had fallen on the old snow, it all melted off again in a few hours, even without the assistance of the sun's direct rays. On the glacier at 13,000 feet it had all disappeared 12 hours after it fell.

On revisiting Pinduri about the middle of October, the change that had taken place was very striking. Now not a sign of snow was to be seen on any part of the road up to the very head of the glacier. A luxuriant vegetation had sprung up, but had already almost entirely perished, and its remains covered the ground as far as I went. From this elevation, about 13,000 feet, evident signs of vegetation could be seen to extend far up the less precipitous mountains. The place is not one at which the height of the perpetual snow can be easily estimated, for on all sides are glaciers, and the vast accumulations of snow from which they are supplied, and these cannot always be readily distinguished from snow in situ; but as far as I could judge, those places which might be considered as offering a fair criterion were free from snow up to 15,000 or even 16,000 feet.

Towards the end of August I crossed the Barjikáng pass, between Rálam and Juhár, the elevation of which is about 15,300 feet.\* There was here no vestige of snow on the ascent to the pass from the south-

\* This pass is so far within the belt of perpetual snow that it cannot be held to afford any just arguments as to the position of the snow line on the extreme southern edge of the belt.

east, and only a very small patch remained on the north-western face. The view of the continuation of the ridge in a southerly direction was cut off by a prominent point, but no snow lay on that side within 500 feet of the pass; while to the north I estimated that there was no snow in considerable quantity within 1500 feet or more, that is nearly up to 17,000 feet. The vegetation on the very summit of the pass was far from scanty, though it had already begun to break up into tufts, and had lost that character of continuity which it had maintained to within a height of 500 or 600 feet. Species of *Potentilla*, *Sedum*, *Saxifraga*, *Corydalis*, *Aconitum*, *Delphinium*, *Thalictrum*, *Ranunculus*, *Saussurea*, *Gentiana*, *Pedicularis*, *Primula*, *Rheum* and *Polygonum*, all evidently flourishing in a congenial climate, showed that the limits of vegetation and region of perpetual snow were still far distant.

In addition to these facts it may not be out of place to mention, that there are two mountains visible from Almora, *Rigoli-gúdri* in Garhwál, between the Kailanga and Nandákni, and *Chipulá* in Kumaon, between the Gori and Dauli (of Dárma), both upwards of 13,000 feet in elevation, from the summits of which the snow disappears long before the end of the summer months, and which do not usually again become covered for the winter till late in December.

The authorities cited by M. Humboldt in his *Asie Centrale*, give the following heights to the snow-line on the southern slope of the *Himálaya*.\*

	<i>Toises.</i>	<i>English feet.</i>
Webb, .....	1954, or	12,500
Colebrooke, .....	2032 —	13,000
Hodgson, .....	2110 —	13,500
A. Gerard, .....	2080 —	13,300
Jacquemont, .....	1800 —	11,500

*Webb, Colebrooke, Hodgson.* Immediately before the list of heights just given, M. Humboldt quotes the following part of a letter from Mr. Colebrooke: "There is a paper of mine in the *Journal of the Royal Institution* for 1819 (Vol. 17, No. 13) on the limit of snow. I deduced from the materials which I had that the limit of constant

\* *Asie Centrale*, T. 3. p. 295. I take no account of the height assigned by M. M. Hügel and Vigne, as they do not refer to the region to which I confine myself.



congelation was 13,000 feet in the parallel of  $31^{\circ}$ . according to Capt. Hodgson's information, and 13,500 feet at Lat.  $30^{\circ}$ . according to Capt. Webb's."\* I am unable to refer to the paper here alluded to, but a number of the *Quarterly Journal of Science* (T. 6, No. 11, pp. 51—57), has come into my hands, in which is a paper entitled "height of the Himálaya mountains," signed H. T. C., and evidently written by Mr. Colebroke. From this I extract the following sentences: "The limit of congelation is specified by him (Capt. Webb), where he states the elevation of the spot at which the Gori river emerges from the snow, viz. 11,543 feet. This observation it may be right to remark is consonant enough to theory which would assign 11,400 for the boundary of congelation in Lat.  $30^{\circ} 25'$ ." Now as Mr. Colebroke was not an original observer, the way in which he talks of the limit of snow and then of the limit of congelation, using them as synonymous terms, would, independently of any other error into which he may have fallen, afford strong grounds for our supposing that he had no very precise ideas as to the meaning of the expression, limit of snow. But all doubt on the subject ceases, when we learn that 'the spot at which the Gori river emerges from the snow,' is neither more nor less than the extremity of an immense glacier; and when we see, as I have done, that at an elevation not 150 feet less great, and within a mile of this spot said to be at the limit of constant congelation, is situated Milam, one of the largest villages in Kumaon, where crops of wheat, barley, buckwheat, and mustard are regularly ripened every year; and that no snow is to be found in the neighbourhood in August or September at an elevation of at least 16,000† feet or 4,500 feet above the spot alluded to; it is evident that Mr. Colebrooke either used the term limit of snow in a sense very different from that now applied to it, or has been left altogether in the dark, as to those facts on which alone an opinion of any value could be formed.

I am without any means of discovering whether Capts. Webb or Hodgson ever published any distinct opinions as to the height of the snow-line, but it appears probable that the information to which Mr. Cole-

\* The numbers in M. Humboldt's list do not agree with this; they have possibly been transposed by accident.

† I say 16,000 feet, as up to that height I am certain, but 18,000 is more probably the truth.

brooke alludes is simply their record of the heights of places. At all events however their evidence must be considered of little value, as they neither of them knew what a glacier was. Capt. Webb, as we have seen, talks of the Gori emerging from the snow, when we know that in reality it rises from a glacier. Capt. Hodgson falls into a similar error in his description of the source of the Ganges, (*vide Asiatic Researches*, T. 14, pp. 114—117). He says “the Bhagirati or Ganges issues from under a very low arch at the foot of the grand snow bed,” and from the almost exact coincidence of the heights it is plain that this is his limit of snow. There is not however the slightest doubt that the low arch was merely the terminal cave of a glacier, and that it was far below the lower limit of perpetual snow, though when Capt. Hodgson was there in the spring the place was probably snowy enough.

*A. Gerard*. I have not the means of reference to the passage quoted by M. Humboldt in support of the height given by Capt. Gerard, but in the “account of Koonawur,” which may be presumed to shew Capt. Gerard’s latest views on these matters, he says :—“The limit of perpetual snow is lowest on the outer Himalaya,” (by which he means the Bissehir range), “and here the continuous snow beds exposed to the south are about 15,000 feet.”\* It is not impossible that the height which M. Humboldt gives refer to some *line of perpetual congelation*, on a number of different varieties of which Capt. Gerard remarks, such as where it always freezes, freezes more than it thaws, freezes every night, or finally where the mean temperature is 32° Fahrenheit. These, however interesting in their own way, are not the *snow-line*.

*Jacquemont*. The height given by this traveller is fully explained by the note that M. Humboldt adds, “au nord de Cursali et de Jumnautri ou la limite des neiges est horizontalement très tranchée.”—*Jacqu*: *Voy. dans l’Inde*, p. 99. Now M. Jacquemont visited Jamnotri in the middle of May, when no doubt he found the snow line

\* Account of Koonawar, p. 159. It appears to me possible that the Gerards, who knew as little of glaciers as Webb or Hodgson, did not fall into similar mistake in their estimate of the height of the snow-line on the Bissehir range, because there are no glaciers or none of any size on that face, owing to the small height, less than 2000 feet, that the average line of summit rises above the snow-line. This however is only conjecture, for though I am satisfied that glaciers do exist on the north face of that range, I have in vain endeavoured to come to any conclusion as to the southern face. It may be proper to add that I have never been there myself.

'très tranchée' at 11,500 feet. I have already shewn that I found the same thing myself at Pinduri, where the snow in the autumn had all disappeared up to 15,000 feet or more. If his visit had been made in January he would probably have found the snow below 8000 feet, but this is not *perpetual snow*.

These heights therefore must all be rejected; nor can it be considered at all surprising that any amount of mistake as to the height of the snow line should be made, as long as travellers cannot distinguish snow from glacier ice, or look for the boundary of perpetual snow at the beginning of the spring.

2. *Northern limit of the belt of perpetual snow*.—My own observations on the snow-line in the northern part of the chain were made in September, 1848, on my way from Milam into Hundes, viâ Uñta-dhúra, Kyungar-ghát and Balch-dhúra, at the beginning of the month; and on the road back again viâ Lákbur-ghát at the end of the month.

Of the three passes that we crossed on our way from Milam, all of them being about 17,700 feet in elevation, the first is Uñta-dhúra, and we saw no snow on any part of the way up to its very top, which we reached at about 4 P. M. in a very disagreeable drizzle of rain and snow. The final ascent to the pass from the south is about a thousand feet; it is very steep at the bottom and covered with fragments of black slaty limestone. The path leads up the side of a ravine, down which a small stream trickles, the ground having a generally even and rounded surface. Neither on any part of this, nor on the summit of the pass itself, which is tolerably level, were there any remains of snow whatever; the ground being worked up into deep black mud by the feet of the cattle that had been lately returning to Milam. On the ridge to the right and left there were patches of snow a few hundred feet above; and on the northern face of the pass an accumulation remained that extended about 200 feet down, apparently the effect of the drift through the gap in which the pass lies. Below this again the ground was everywhere quite free from snow. On the ascent to Uñta-dhúra, at perhaps 17,000 feet, a few blades of grass were seen, but on the whole it may be said to have been utterly devoid of vegetation. On the north side of the pass, 3 or 400 feet below the summit, a Cruciferous plant was the first that was met with.

The Kyungar pass, which is 5 or 6 miles north of Uñta-dhúra,

was found equally free from snow on its southern face and summit, which latter is particularly open and level. The mountains on either side were also free from snow to some height, but on the North, as on *U̇nta-dhúra*, a large bed lay a little way down the slope, and extended to about 500 feet from the top. On this pass a Boragineous plant in flower was found above 17,000 feet; a species of *Urtica* was also got about the same altitude, and we afterwards saw it again nearly as high up on the *Lákhur* pass.

From the *Kyungar-ghát*, a considerable portion of the southern face of the *Balch* range, distant about 10 miles, was distinctly seen apparently quite free from snow. In our ascent to the *Balch* pass no snow was observed on any of the southern spurs of the range, and only one or two very small patches could be seen from the summit on the north side. The average height of the top of this range can hardly be more than 500 feet greater than that of the pass, and as a whole it certainly does not enter the region of perpetual snow. As viewed from the plains of *Hundes* it cannot be said to appear snowy, a few only of the peaks being tipped.

We returned to *Milam* viâ *Chirchun*. The whole of the ascent to the *Lákhur* pass was perfectly free from snow to the very top, i. e. 18,300 feet, and many of the neighbouring mountains were bare still higher. The next ridge on this route is *Jainti-dhúra*, which is passed at an elevation of 18,500 feet, but still without crossing the least portion of snow. The line of perpetual snow is however evidently near; for though the *Jainti* ridge was quite free, and some of the peaks near us were clear probably to upwards of 19,000 feet, yet in more sheltered situations unbroken snow could be seen considerably below us, and on the whole I think that 18,500 feet must be nearly the average height of the snow-line at this place.

M. Humboldt's list of heights for the Northern slope is as follows:

	<i>Toises.</i>	<i>English feet.</i>
Webb, .....	2600,	or 16,600
Moorcroft, .....	2900	— 18,500
A. Gerard, .....	3200	— 20,500
Jacquemont, .....	3078	— 19,700

*Webb.* The height given on the authority of Capt. Webb is simply that of the *Niti* pass, which Capt. Webb crossed without snow in



August 1819, and Moorcroft in June\* and August 1811. The Niti pass is notoriously the easiest of all the Garhwál and Kumaon passes, and remains open long after those from Juhár, which I have described above, have become impracticable; and it is held to be a certain way of escape from Tibet, by the Juháris, should a fall of snow more early than usual stop their own passes, while they are to the north of the *Himálaya*. It may therefore be fairly concluded that the snow-line recedes considerably above the Niti pass, as it should do if my estimate of its height be correct.

*Moorcroft*. The passage quoted in support of this height is as follows:—"Now Mr. Moorcroft had his tent covered two inches deep (with snow) when close to Manasarowar and on the surface of the ground it lay in greater quantities; and if his elevation was 17,000 feet† we have clear evidence that the climate of the table-land, notwithstanding the increased heat from the reverberation of a bright sun, is equally as cold as in the regions of eternal snow in the Himalayan chain, although the country of the former exhibits no perpetual snow except at heights of 18,000 and 19,000 feet." (*Tours in the Himalaya*, T. 1. p. 319). The words are those of Dr. Gerard, who on his own authority thus gives 18,000 or 19,000 feet as the elevation of the snow-line in the part of Tibet near the Sutlej; and this, as far as it goes, corroborates the conclusion to which I have come.

*A. Gerard*. In the absence of the books to which M. Humboldt refers, I conclude that the height here given is that to which Capt. Gerard supposed the snow receded on the ridge above Nako. But this is to the North of the Sutlej, and therefore is not in the region to which I have confined myself. In the "Account of Kunawar" however the following remark that is applicable, is to be found:—"In ascending the Keoobrung pass, 18,313 feet high in July, no snow was found on the road," (p. 159). This pass is situated on the water-shed of the *Himálaya* about 20 miles east of the great bend in the Sutlej, and about 8 miles to the south of that river; it is on the northern limit of the belt

\* Not *January*, as is erroneously printed in the 'Asie Centrale' Vide, Asiatic Researches, Vol. 12, pp. 417—494.

† The elevation of Mánasarowar, as M. Humboldt correctly conjectured, is about 15,200 feet only.

of perpetual snow, the ground between it and the Sutelj not being of sufficient height to be permanently covered with snow.

*Jacquemont*. The Keoobrung pass of Capt. Gerard, under a name slightly changed, is the same as that from which M. Jacquemont made his observations, "Sur le col de Kioubrong (entre les rivières de Buspa et de Shipke ou de Lang zing khampa) à 5581 mètres (18,313 feet) de hauteur selon le capitaine Gerard, je me trouvai encore de beaucoup audessous de la limite der neiges perpétuelles dans cette partie de l'Himalaya (lat.  $31^{\circ} 35'$ , long.  $76^{\circ} 38'$ ). " Je crois pouvoir porter la hauteur des neiges permanentes dans cette region de l'Himalaya à 6000 mètres (19,700 feet,") (*Asie Centrale*, T. 3. p. 304). I will admit that M. Jacquemont's estimate of the height of the snow-line on the southern face of the range, is not such as to induce me to place implicit confidence in this either ; but allowing for some little exaggeration, there can be no room for doubting that the snow-line must here recede nearly to 19,000 feet.

Whether the result at which I have arrived from what I saw on the Juhár passes be too little, or this too great, or whether there may not be in fact a difference of elevation, are matters of comparatively small importance. As I purpose to point out hereafter, the chances of error in the determination of great altitudes by single Barometrical observations are very considerable, more particularly when as is most generally the case, there is no corresponding observation within 60 or 70 miles. All of these heights are deduced from such observations, and errors of 150 or even 200 feet on either side of the truth, or differences of 300 or 400 feet, may, I am satisfied, quite easily arise in the calculations. I shall therefore continue to call the height of the snow-line at the Northern limit of the belt of perpetual snow, 18,500 feet; not that I consider my own calculation as worthy of more confidence than Capt. Gerard's, or M. Jacquemont's, but that it is, in the present state of our knowledge, sufficiently exact, and certainly not exaggerated.

As the principal object of the present enquiry is the elevation of the snow-line in the *Himálaya* I have in the foregoing observations confined myself strictly to that region of these mountains that I at first specified ; but it is not the less important to notice the heights at which we find perpetual snow still further to the north. Capt. Gerard, after mentioning the Keoobrung pass, goes on to say, "In August when I

crossed Manerung pass, 18,612 feet," a pass on the range that divides Piti from Kunáwar, "there was only about a foot of snow, which was new and had fallen a few days before." "In October on the ridge above Nako," about 5 miles north of the great bend in the Sutlej, "we ascended to 19,411 feet, and the snow which was all new and no more than a few inches deep, was only met with in the last 400 or 500 feet; this was on the face of the range exposed to the west, but on the opposite side no snow was seen at almost 20,000 feet."—(p. 160). During the whole of our expedition into Hundes in September 1848, we only saw very small patches of snow in two places, on both occasions in sheltered ravines; but in the part of the country through which we passed perpetual snow is not to be looked for, the highest mountains probably not exceeding 18,000 feet in height. In the true plains of Tibet, snow would be just as difficult to find in the summer months, as in the plains of India. From my own observations made in this journey, I infer that the height of the limit of snow on the southern face of Kailás is not less than 19,500 feet; and there is nothing now on record that I know of, that indicates the latitude beyond which the snow-line again begins to descend.

From a review of the whole of the facts that have been brought forward, it may I think be considered as fully established, that M. Humboldt, though underestimating the actual elevation of the snow-line, was certainly right in what he advanced as to the relative height on the two opposite faces of the chain. The doubts that were raised by Capt. Hutton on this point in his paper entitled "Correction of the erroneous doctrine that the snow lies longer and deeper on the southern than on the northern aspect of the Himalaya," were perhaps almost sufficiently answered by Mr. Batten at the time they were first brought forward; but as I have reopened the whole question I will add a few words on this subject also.\*

\* Vide M'Clelland's Journal, Nos. 14, 16, 19, 21. Captain Hutton's first letter begins thus; "Previous to my trip through Kunawar in 1838, I had frequently heard it contended that the snow lay longer, deeper, and farther down on the *southern* exposure of the Himalaya than it was found to do on the northern aspect, you may therefore easily imagine my astonishment, when crossing the higher passes through Kunawar, Hungrung and Pitti, I found the actual phenomena to be diametrically opposite to such a doctrine, and that the northern slopes invariably

The doctrine that Capt. Hutton attacks as erroneous, undoubtedly is so. But it is a doctrine that was never inculcated by any one.—Capt. Hutton having misunderstood the true enunciation of a proposition, reproduces it according to his own mistaken views, and then destroys the phantom that he has raised. The fact that Captain Hutton saw to be true was this, that as a general rule, snow, sporadic, as well as perpetual, will be found to lie at a lower level on the northern, than on the southern aspect on any individual range in these or any other mountains. In drawing his conclusions from this fact, the first error into which he fell was to confound the north and south aspects of *the individual ridges*, with the north and south aspects of *the chain*; and he somewhat complicates matters by neglecting to distinguish between *snow* and *perpetual snow*. These mistakes having been pointed out to him, he tried to correct them, but still could not get over the terms *north and south declivity*; for he ends by assuming that they apply to the north and south aspects of the Bissehir range, which he conceives to be ‘the true *Himálaya*, the central or main line of snowy peaks.’ Here he falls into an error of logic no less flagrant than the former; he restricts the term ‘*Himálaya*’ to this range, which may or may not be central, for that has nothing to do with the matter, and then assumes that this *Himálaya* of his own, is the *Himálaya* of whose north and south declivities we speak, when we repeat that the snow-line *is* at a greater elevation on the northern than on the southern face of the chain.\*

carried more snow than the southern exposure.” (No. 14. p. 275.) In his last letter he says, “I have already acknowledged the faultiness of my first letter, in so far as regards my having omitted to state in sufficiently distinct terms, that my remarks referred to the actual northern and southern aspects of the true *Himálaya* or central or main range of snowy peaks, and not to the aspects of secondary groups and minor ranges.” This ‘true *Himálaya*’ is the Bissehir range of which I have often spoken. I say nothing of Capt. Hutton’s views regarding perpetual snow, the existence of which, as far as I can understand him, he appears to doubt.

\* The word ‘*Himálaya*,’ which to the natives of these mountains means only the snowy peaks, is in the language of science applied to the whole chain, and in my opinion properly. Any division of the chain into ‘*Himálaya*,’ or snowy ranges, and ‘sub-*Himálaya*’ ranges not snowy, such as has I believe been made, appears to me objectionable, not only as unusual in the terminology of physical geography, and therefore likely to lead to confusion such as that of which we have just had a specimen; but as artificial and unnecessary. I repeat artificial, for in spite of the specious



The height to which the snow-line has been shown to recede on the southern face of the *Himálaya*, though considerably greater than had been supposed by M. Humboldt, still does not exceed what the analogy of mountains in similar latitudes in the other hemisphere might have led us to expect. In the central part of Chili, in Lat.  $33^{\circ}$  S. we find that the lower limit of perpetual snow is at 14,500 or 15,000 feet, while in Bolivia, in Lat.  $18^{\circ}$  S. it reaches 16,000, and even on some of the peaks 19,000 feet.\* There is therefore no appearance of any thing unusual in the general height of the snow-line, which need induce us to suppose the existence of any extraordinary ascending current of heated air, regarding which M. Humboldt enquires. The exceedingly high temperature, surpassing that known at any other part of the earth's surface, which the air over the plains of North-Western India acquires during the summer, must of course produce a sensible effect in heating the upper strata of the atmosphere. But as far as I am enabled to form an opinion from the few facts that have come to my knowledge regarding the temperature of the higher regions in these mountains, I think there is little doubt that the same cause which produces this great temperature in the plain, that is, the direct radiation of the sun, acts immediately so powerfully in heating the surface of the mountains, and thereby raising the temperature of the air over them, and in melting the snow, that the secondary effects of the heated air that rises from the plains of India must be almost imperceptible.

From the way in which the term *north declivity* was introduced into the enunciation of the phenomenon of the greater elevation of the snow-line at the northern edge of the belt of perpetual snow, an idea naturally arose that it was observed only on the declivity immediately facing the plains of Tibet, and M. Humboldt, in the quotation I before gave from '*Cosmos*,' is careful to restrict it to the peaks which rise

appearance of the distinction it will not bear examination. The association of *mountains* into *chains* should be based upon the physical character and affinities of the mountains themselves, quite irrespective of any adventitious circumstances of snow or of vegetable and animal life. Botanical or zoological regions will almost always be found to follow closely the configurations of the earth's surface, on the accidents of which they chiefly depend; but to make the classification of the latter depend upon the former would be a manifest absurdity.

\* *Asie Centrale*, T. 3, pp. 275, 277, 329.

above the Tartarian plateau. But this, as may have been inferred from what I have already said on the state of the three ranges that are crossed in succession between Milam and Tibet, is quite a mistake ; the fact being that the greater elevation is observed on the Tibetan face in common with the whole of the more northern part of the chain. From the remarks before made on the state in which I found the Barj-káng pass, it will be seen that even so near as it is to the southern limit of the belt of perpetual snow, a perceptible increase of elevation had already taken place. M. Jacquemont, as quoted by M. Humboldt, says, “ Les neiges perpetuelles descendent plus bas sur la pente méridionale de l'Himalaya, que sur les pentes septentrionales, et leur limite s'élève constamment à mesure que l'on s'éloigne vers le nord de la chaîne qui borde l'Inde.” (*Asie Centrale*, T. 3. p. 303.) With the proviso that the rise here spoken of is not regular, but more rapid as we cross the first great masses of perpetual snow, I entirely concur in M. Jacquemont's way of putting the case.

That the radiation from *the Plains of Tibet* can have nothing to do with the greater height to which the snow-line recedes *generally* in the northern part of the *Himálaya*, is evident, for it must be all intercepted by the outer face of the chain ; and that its effects even on this outer face are of a secondary order, seems to me sufficiently proved by the consideration, that on the Balch range, which rises immediately from those plains, what little snow is to be seen is on the Northern slope exposed to the radiation, while none whatever remains on the Southern slope, which is quite protected from it, exactly as is the case with every mountain anywhere.

It may therefore be concluded that some other influence must be in operation, the effects of which are generally felt over the whole of the more northern parts of the *Himálaya*, and such an influence is I conceive readily to be found, in the diminished quantity of snow that falls on the northern, as compared to the southern part of the chain.

The comparative dryness of the climate to the north of the first great mass of snowy mountains, is not now noticed for the first time ; it is indeed notorious to the inhabitants of Simla, and travellers often go into Kunáwar with the express object of avoiding the rains. Capt. Gerard thus describes the climate of the western part of the *Himálaya* : “ In the interior (i. e. of Kunáwar) at 9000 and 10,000 feet snow is

scarcely ever above a foot in depth, and at 12,000 it is very rarely two feet, although nearer the outer range four or five feet are usual at heights of 7000 or 8000 feet. In these last places there is rain in July, August and September, but it is not near so heavy in the lower hills. When Hindustan is deluged for three months, the upper parts of Kunáwar are refreshed by partial showers; and with the exception of the valley of the Buspa, the periodical rains do not extend further to the eastward than Long. 77°.\* (*Account of Kunáwar*, p. 61). He again says relative to the most northern parts of Kunáwar and the neighbouring portion of Tibet, "With the exception of March and April, in which months there are a few showers, the uniform reports of the inhabitants represent the rest of the year to be almost perpetual sunshine, the few clouds hang about the highest mountains and a heavy fall of snow or rain is almost unknown." (*Ibid*, p. 95.).

The testimony of Capt. J. Cunningham, who passed a winter in the most northern part of Kunáwar, as to the small quantity of snow that falls, is particularly valuable. He says, "In this country a southerly wind and the sun together keep slopes with a southern exposure and 12 and 13,000 feet high, quite clear of snow, (except when it is actually snowing,) and this too towards the end of January and beginning of February, or I may say at all times." Also "here I am (*April 6th*, 1842) about 9000 or 9500 feet high, wind generally southerly, no snow whatever on southern slopes within 15 or 16,000 feet, apricot trees budding, but on northern slopes and in hollows abundance of snow."† (*McClelland's Calcutta Journal of Nat. History*, No. 14, pp. 281, 282).

\* That the fall of snow at 7000 feet is ever 5 feet in any part of these hills may I think be doubted. The Buspa is the river that runs immediately at the foot of the north declivity of the Bissehira range; and I suppose that Capt. Gerard means, that the rains do not extend up the Sutlej beyond the point where the Buspa falls into it.

† These paragraphs are taken from extracts of letters of Capt. Cunningham, given by Capt. Hutton in support of his arguments as to snow lying lower on North than on South exposures, which accounts for the last sentence. But whatever the quantity of snow may have been on the north slopes, compare the heights here given as being clear of snow early in *April*, viz. 15,000 feet, with what I have above shown to be the limit to the South of the great peaks as late as the middle of *May* viz. 12,500 feet.

From my own experience I can also speak of the remarkable change of climate that is met with in the month of August, in passing from the south to the north of the line of great peaks, by the vallies of the Gori and Rálam rivers. A straight line joining the peaks No. 14, (Nandá-devi), and No. 18, (the northern of the Páñch-chúli cluster,) cuts the Gori a little below Tola and the Rálam river about five miles further to the east near the village of Rálam. The road up the Gori being at that season impracticable, I went up the Rálam river to Rálam and thence crossed over to the Gori by the Barji-káng pass, which is on the ridge that separates the two rivers and that terminates in the peak No. 16 (Hansá-ung). From the limit of forest to the village of Rálam, the elevation of which is about 12,000 feet, the vegetation, chiefly herbaceous, was of the most luxuriant growth and boundless variety, and the soil was saturated with moisture. On crossing the Barji-káng pass and descending to the Gori, we were immediately struck with the remarkable change in the character of the vegetation, which had already lost all its rankness. But a mile or two above the village of Tola the alteration was complete; the flora had shrunk within the most scanty limits, the bushes hardly ever deserving the name of shrub, the few herbs that were there were stunted and parched, the soil dry, and the roads quite dusty. At Melam the still closer approximation of the climate to that of Tibet, is clearly shewn by the occurrence of several plants undoubtedly Tibetan, that are not found farther to the South. Such are *Caragana versicolor*, the 'Dama' of the Bhotias, which covers the plains of Tibet; a *Clematis*, dwarf *Hippophaë*, *Lonicera*, and two or three *Potentillas*; and no doubt several others might be named.

Now although it is to the winter and not to the summer rains,\* that the precipitation of snow on these mountains is to be ascribed, yet the circumstances under which the vapour is condensed appeared to be the same at both seasons. Southerly winds blow throughout the year over the Himálaya, in the winter with peculiar violence;† and whatever be

\* Although it does not appear to be so well known, the winter rains of North Western India are as strictly periodical as those of the summer.

† The Southerly winds that prevail at considerable heights in the Himálaya, and in the countries to the north, are diurnal phænomena, evidently dependent on the apparent motion of the sun; and in their time of beginning of maximum and of ending, greatly resemble the hot winds of the plains of India, which have a similar origin.



the more remote cause of the periodical recurrence of the rains, there can I think be little doubt, that the proximate cause of the condensation of by far the greater portion of the snow or rain that falls on the snowy mountains, is that the current from the south is more damp or hot than the air in contact with the mountains against which it blows ; a relation which holds good in the winter as well as in the summer.

Thus the air that comes up from the south, no sooner reaches the southern boundary of the belt of perpetual snow, where the mountains suddenly rise from an average of perhaps 8,000 or 10,000 feet to nearly 19,000 or 20,000, than it is deprived of a very large proportion of its moisture, which is converted into cloud, rain or snow, according to circumstances. And the current, in its progress to the north, will be incapable of carrying with it more moisture, than is allowed by the very low temperature to which the air is of necessity reduced in surmounting the snowy barrier, 19,000 or 20,000 feet in altitude, that it has to pass. Nor can any further condensation be expected at all comparable in amount to what has already taken place, as it would manifestly demand a much more than corresponding depression of temperature ; and this is not at all likely to occur, for the most elevated peaks being situated near the southern limit of perpetual snow, the current on passing them will more probably meet with hotter than with colder air.

It is, I conceive, to precisely similar causes, that we should attribute the great amount of rain that is known to fall at Mahabaleshwar, on the Western ghats, at Chira-punji, in Sylhet, and generally, though the quantity is far less, along the most southern range of the Himálaya itself ; and it is curious to observe that the comparative dryness of the less elevated country to leeward also holds good in these cases. In the Deccan, the country immediately to the east of the western ghats, Col. Sykes tells us, that “the rains are light, uncertain, and in all years barely sufficient for the wants of the husbandman.” On the same authority we find, that while the mean fall of rain for 3 years at Poona was about 27 inches,\* that at Mahabaleshwar for 1834 was no less than 302 inches.† Although I have not the exact figures to refer to, I know that the rain at Nainee Tal on the external range of the Himálaya, is about double what falls at Almora, not 30 miles to the north.

\* British Association's 7th Report, p. 236.

† *Ibid*, 9th Report, p. 15, (Sections.) The exact amount is 302.21 inches.

It will therefore be seen that as I hold the direct action of the sun to be the primary cause of the great general height to which the snow line recedes, so I consider that the increase of the height in the northern part of the chain chiefly depends, not on any additional destructive action, but on the smaller resistance offered by a diminished quantity of snow, to destructive forces, which are not indeed constant throughout the whole breadth of the chain, but whose increase appears to have no dependence on increase of distance from the southern limit of the belt of perpetual snow. Among the more evident causes of the irregularities in the melting of the snow, may be mentioned, the powerful action of the heavy summer rain on the southern face, as compared with what falls as little more than a drizzle on the northern; the protection afforded from the radiation of the sun by the heavy clouds so frequent on the south, contrasted with the relative slight resistance of the less dense, but not uncommon clouds on the north; the differences in the temperature of the air that acts on the lower edge of the snow produced by the difference of height of the snow-line on the opposite faces of the chain; and lastly, the differences of the temperature of the air and of the amount of radiation and reflexion dependent on the differences in the state of the surface of the earth, which on the south is densely clothed with vegetation, while on the north it is almost bare.

Before concluding I will observe, that the height at which it is certain that snow will fall every year, in this region of the Himálaya, is about 6500 feet; and at an elevation of 5000 feet it will not fail more than one year out of ten. The least height to which sporadic falls of snow are known to extend, is about 2500 feet; and of such falls there are only two authentic instances on record since the British took possession of Kumaon, viz. in 1817 and 1847. Thus we see that the regular annual fluctuation of the snow line, is from 9000 to 10,500 feet, and it occasionally reaches even 13,000 feet. M. Humboldt informs us that under the equator at Quito the fluctuation is 600 Ts. (3,800 feet); that at Mexico it reaches 1350 Ts. (8,600 feet); and the greatest fluctuation that he mentions is that in the south of Spain, which amounts to 1700 Ts. (10,900 feet).\*

A brief recapitulation of the principal results of this enquiry will show us, that the snow-line, or the southern edge of the belt of perpetual

\* *Asie Centrale*, T. 3. p. 279.

snow in this portion of the Himálaya, is at an elevation of 15,500 feet, while on the northern edge it reaches 18,500 ft.; and that on the mountains to the north of the Sulej, or still further, recedes even beyond 19,000 feet. The greater elevation which the snow-line attains on the northern edge of the belt of perpetual snow, is a phænomenon not confined to the Tibetan declivity alone, but extending far into the interior of the chain; and it appears to be chiefly caused by the quantity of snow that falls on the northern portion of the mountains, being much less than that which falls further to the south, along the line where the peaks covered with perpetual snow first rise above the less elevated ranges of the Himálaya.

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*Notes on the Languages spoken by the various tribes inhabiting the valley of Asam and its mountain confines. By WILLIAM ROBINSON, Inspector of Government Schools in Asam.*

(Concluded from page 237.)

## PART II.

Our subsequent remarks, according to previous division, will have reference to the second great class or group of languages. These are spoken on the southern confines of the valley, and appear, more intimately than any of those already examined, to be connected with the great Chinese Stock.

A striking peculiarity in them all is, the absence of inflections, which to the classic reader appear almost essential to the existence of human speech. That this deficiency is opposed to the formation of long and sonorous words, is certain, for it is chiefly to the numerous and varied inflections employed by the Greeks, for instance, we are to attribute their ability to produce that full and majestic volume of sound which so peculiarly distinguishes their language. But among rude and semi-barbarous tribes remarkable for their comparative taciturnity and preference of plain sense over the flowers of oratory, such deficiencies it may be supposed are unimportant; especially when we consider that among the languages of the Western nations our own comes nearest to the Chinese stock in this respect; the utmost number of variations which an English verb undergoes never exceeding seven.

The deficiency referred to, however, is made up for by the use of small particles and appendages, though more frequently by the relative position of words in the formation of sentences, which is found amply sufficient to remove all ambiguity. Indeed, we find with respect to many English verbs (the verb to *cut* for instance) that of the two hundred and sixteen verbal variations which it undergoes, position alone is found equal to the task of forming two hundred and eleven, only five being formed by the addition of terminations to the original monosyllable; namely, *cuttest*, *cuts*, *cutteth*, *cuttedst*, and *cutting*.

What the English language then effects in so great a degree by position, these languages do almost wholly thereby.

The first of the group that demands our attention is

#### THE KHAMTI,\*

which in common with the Siamese, Burmese, Laos, Shyan and Ahom, is only a dialect of the language usually known as the Tai; a language more or less prevalent through all that wide tract of country extending from Siam to the valley of the Brahmaputra.

In a language so extensive in its use, it might be conjectured that local peculiarities would have given rise to a great diversity of dialects, so that the Khamti and Siamese, spoken at the extremities, would have presented but few links of connection. On the contrary, however, we find that the discrepancies between the two are very trifling.

Mr. Brown's investigations lead him to the conclusion, that upwards of nine-tenths of the fundamental words are the same in these two dialects, with the exception of a few slight variations in pronunciation. These variations are mostly confined to a few letters, viz. *ch*, which the northern tribes change to *ts*; *d*, for which they use *l* or *n*; *r*, which becomes *h*; and *ua* which is changed for long *o*.

Different systems of writing have been introduced to express the sounds of the different dialects of the Tai. The Khamti and Shyan alphabets are evidently derived from the Burmese; the Laos is nearly related to the Burmese, but more complete and better adapted to the wants of the language than the Shyan; while the Siamese character bears only a remote resemblance to the Burmese.

\* I am indebted to the kind assistance of the Rev. N. Brown for my notes on this language.



These alphabets are here presented in a tabular form for the sake of comparison. Both in their arrangement and in the power of the particular letters they seem to coincide with the Sanskrit Alphabetic System, from which they have evidently been borrowed. To provide for the expression of the varieties of accent and intonation common to the colloquial use of these tongues, double and triple combinations of letters occur (as in Bhotia) varying in extent according to the exigencies of each particular language. In Khamti, each of these letters is varied by sixteen simple accentuations, and by thirty-six complex ones. Hence it may be supposed that this dialect approximates very closely to the delicacy of the Chinese accentuation.

The Khamti is a purely monosyllabic language, and more powerfully accented than any of the Indo-Chinese languages spoken on the Asam frontier. In some degree, indeed, it seems connected with some of the Chinese dialects, especially the Mandarin or Court language, with which its numerals, as well as a few other terms, coincide, but these are not very numerous. By its finely modulated intonations, sounds organically the same are often made to express totally different ideas. Thus, *má*, for instance (with the rising tone) signifies a *dog*; *má*, (the Italic *m* denoting the falling tone) signifies *to come*; while the same syllable, with an abrupt termination, or a sudden cessation of the voice at the end of it, *má*, denotes a *horse*.

#### OF NOUNS.

As inflections are unknown to the language, the accidents of Case, Mood, and Tense are expressed by means of particles, generally following, but in some cases preceding the nouns or verbs they serve to modify.

The Nominative and Accusative cases do not need the aid of particles; they are merely the nouns in their natural state.

The expression of the Genitive case, depends solely on the juxtaposition of the two substantives in which, contrary to the idiom of the Chinese, the *latter* substantive is understood to be in the genitive case. Thus; *mü*, *hand*, and *man*, *he*, when placed in juxta-position, *mü man*, signify *his hand*. *Háng*, *a tail*, and *pá*, *a fish*. *Háng pá*, *a fish's tail*.

The Dative case is sometimes denoted by a prepositive particle to mark the person receiving, or, more frequently by the position of the noun before a donative verb,—a usage by no means foreign to the English language, in which such expressions as, I sent George a book, I gave

a ball to James, are extremely common. The preposition *Hang* is most commonly used as the particle to denote the dative case. Thus :

<sup>2</sup>Hang <sup>3</sup>man <sup>1</sup>haü <sup>1</sup>da. <sup>1</sup>Give (it) <sup>2</sup>to <sup>3</sup>him. <sup>3</sup>Hang <sup>1</sup>man <sup>2</sup>maü <sup>1</sup>po. <sup>2</sup>You <sup>1</sup>beat <sup>3</sup>him.

The other Cases, denoted in Sanskrit by the names of the Instrumental, the Ablative, and the Locative, are supplied by the use of prepositive particles.

The Khamti noun admits of no plural form. In those instances in which the noun does not express a collective or a plural idea, a numeral added to it renders the expression sufficiently intelligible.

To express the difference of gender in the inferior animals, the term *Thuk*, is used to denote the *male*; and *Me*, the *female*.

*A horse, Masc. Má thuk; Fem. Má me.*

*A deer, Masc. Nyí thuk; Fem. Nyí me.*

*A goat, Masc. Pe thuk; Fem. Pe me.*

*A tiger, Masc. Sü thuk; Fem. Sü me.*

*A dog, Masc. Má thuk; Fem. Má me.*

*A cat, Masc. Miau thuk; Fem. Miau me.*

For individuals of the human family the term *Sáu* is used to distinguish the *male*, and *Ying*, the *female*.

#### Masculine.

*Kum sáu, man.*

*Luk sáu, son.*

*Pi sáu, brother.*

*Kun sáu án, boy.*

#### Feminine.

*Kun ying, woman.*

*Luk ying, daughter.*

*Pi ying, sister.*

*Kun ying án, girl.*

In some cases however gender is indicated by the use of distinct words. Thus; *Po, father; Me, mother. Phó, husband; Mé, wife.*

#### OF ADJECTIVES.

An adjective generally follows a substantive; *examp. Kun ní, a good man.*

*Má ma ní, a bad (not good) dog. Pú pi, a fat sheep.*

In forming the *comparative degree* of the adjective, the word *Leu*, *beyond, than*, is added to it in its positive form. Thus; *yaü, great; yaü leu hün, greater than the house. Kat, cold. Kat leu nam, colder than water.*

The *superlative degree* is formed by the addition of the words *Leu*

*peun.* Thus, *Noí, a mountain ; Sung, high ; Noi sung leu peun, a mountain higher than all, or the highest mountain.*

#### NUMERALS.

The Khamti numerals are the same as those used by the Siamese.

- |          |         |         |          |          |
|----------|---------|---------|----------|----------|
| 1. Nŭng. | 3. Sám. | 5. Há.  | 7. Tset. | 9. Kau.  |
| 2. Song. | 4. Sí.  | 6. Hók. | 8. Pet.  | 10. Sip. |

After which the ordinals are repeated and compounded.

- |               |                  |
|---------------|------------------|
| 11. Sip-it.   | 21. Sáu-it.      |
| 12. Sip-song. | 22. Sáu-song.    |
| 13. Sip-sám.  | 23. Sáu-sám, &c. |
| 14. Sip-sí.   | 30. Sám-sip.     |
| 15. Sip-há.   | 40. Sí-sip.      |
| 16. Sip-hók.  | 50. Há-sip.      |
| 17. Sip-tset. | 100. Pák.        |
| 18. Sip-pet.  | 1000. Heng.      |
| 19. Sip-kau.  | 10,000. Mŭn.     |
| 20. Sáu.      | 1,00,000. Lán.   |

Numeral affixes, or as they have sometimes been called, generic particles, are in common use. These particles are affixed to numeral adjectives, and serve to point out the genus to which the preceding substantive belongs.

Tó, is the numeral affix applied to animals. When the number to be expressed is *one*, the generic particle precedes the numeral, as in Tsàng *tó nŭng, one elephant* ; in every other case it follows the numeral.

<sup>1</sup>Mŭ <sup>2</sup>ka<sup>3</sup>hŭn <sup>4</sup>má <sup>5</sup>nin <sup>6</sup>Kai <sup>7</sup>Sám <sup>8</sup>tó <sup>9</sup>au <sup>10</sup>kwá <sup>11</sup>yau.

<sup>1</sup>Lást <sup>2</sup>night <sup>3</sup>jackal <sup>4</sup>carried off <sup>5</sup>three <sup>6</sup>fowls.

<sup>1</sup>Pe <sup>2</sup>nán <sup>3</sup>luk <sup>4</sup>on <sup>5</sup>yang <sup>6</sup>song <sup>7</sup>tó.

<sup>1</sup>That <sup>2</sup>goat <sup>3</sup>has <sup>4</sup>two <sup>5</sup>kids.

Bai, is the numeral affix applied to such nouns as leaf, paper, umbrella, &c.

Nue, is applied to things round ; Thep, and Phen, to flat substances ; Phŭn, to pieces of cloth ; Sen, to things having length ; Ho, to bundles, packets and the like ; Lem, to sticks, posts, spears, &c. Khót, to ropes, and such articles that can be coiled up ; and Bán, to villages, hamlets, towns, &c.

## OF PRONOUNS.

*Gender* has no place in the Khamti personal pronouns, nor do they undergo any variations indicative of *case*. As far as they are used as substantives, they form the various cases by receiving the prepositions already described as forming this branch of Khamti grammar; *number*, in nouns, as we have already remarked, is determined wholly by the context, or by certain circumstances attending the substantive. But as the pronouns, particularly in discourse, are frequently introduced without that connexion which could instantaneously enable the hearer to decide, whether one or many were intended, the Khamtis have adopted a mode to determine this independently of the connection; and in consequence make use of distinct pronominal terms to express the plural number.

The *personal* pronouns are

Kau, *I*.

Hau, *We*.

Maü, *thou*.

Maü sú, *Ye or you*.

Man, *He*.

Man khau, *They*.

The *reciprocal* pronouns are formed by adding the pronominal adjective Eng, to the personal pronouns, as Kau eng, *I myself*. Hau eng, *we ourselves*. Maü eng, *thou thyself*, &c.

The *relative* pronouns are Yang, and Süng, *who*; Süngti, *which*; and Khru, *that which*.

The *Interrogatives* are Phaü, *who*? An naï, *which*? Sang, *What*?

The *demonstrative* pronouns are An nai, *this*, and An nan, *that*.

The simple *indefinite* pronouns are, Kan phong, *some*; Táng, *other*; nang nai, *such*.

## OF VERBS.

Verbs which have no inflection, can have nothing in them analogous to conjugation as in Greek, Latin and Sanskrit. The various kinds of verbs in Khamti must therefore be denominated wholly from their meaning and signification, as active, passive, neuter, causal, &c.

In the Indicative Mood the verb is in its simplest state, and unconnected with any other to modify its operation.

Only three tenses can be traced in this language, the Present, the Past, and the Future. In the Present, we have the verb in its simple state, in the Past, a particle is added, denoting completion or fulfil-



ment. And another particle, expressing will or determination, marks the Future.

The following will serve as a model for the variations a Khamti verb undergoes.

*Kin, to eat.*

INDICATIVE MOOD.—*Present tense.*

- |                                 |                                   |
|---------------------------------|-----------------------------------|
| 1. <i>Kau kin, I eat.</i>       | 1. <i>Hau kin, We eat.</i>        |
| 2. <i>Maü kin, Thou eatest.</i> | 2. <i>Maü sú kin Ye eat.</i>      |
| 3. <i>Man kin, He eats.</i>     | 3. <i>Man khau kin, They eat.</i> |

*Past tense.*

The particle *yau* is added to the verb.

1. *Kau kin yau, I did eat or have eaten.*
2. *Maü kin yau, Thou didst eat, &c.*
3. *Man kin yau, He did eat, &c.*

In the same manner through the plural number.

*Future tense.*

The particle *ta* is prefixed to the verb.

1. *Kau ta kin, I shall eat.*
2. *Maü ta kin, Thou shalt eat.*
3. *Man ta kin, He shall eat.*

And so on through the plural number.

The participial form is denoted by the particle *an*, put before the verb:—*An kin, eating.*

The *Imperative Mood*, which is used only in the 2nd person, is denoted by the particle *Dá* subjoined to the verb *Kin*đá, *eat thou*. *Kwá* đá, *go thou*. This particle, however, is often omitted in common conversation. As in English, the Khamti admits of the introduction of another verb in the 3rd person. *Hü, give*, is used as the auxiliary verb *let*. *Hü kin, let him eat*. *Hü yú, let him stay*.

The *Potential Mood*, which includes the idea of *power* or *ability*, is commonly expressed by

*Pe, can*. *Man kin pe, He can eat.*

*Káu khan-khan len pe, I can run fast.*

*Duty* or *obligation* is expressed by prefixing the particle *Nai*.

*Man nai kin, He must eat.*

*Kau hang maü ta nai pe I must beat you.*

The *Subjunctive Mood*, which is used to give a conditional force to

the verb is expressed either by Sang, prefixed, or Zam, affixed to the verb; *Kau kin zam, If I eat.*

Sang tüt háng man, ta khañ, *If (you) pull her tail (she) will scratch (you.)*

The *Prohibitive* form, is denoted by the particle Pai, or Yá, prefixed to the verb.

Pai kin, *eat not.* Maü pai lak, *thou shalt not steal.* Yá nye, *do it not.*

Simple *Negation* is implied by Ma, or Mo prefixed to the verb.

*Kau ma kin, I do not eat.*

*Man mo pengasang, He does nothing.*

When a question is asked the particles Gai and Kái, are usually added to denote *interrogation*.

Maü kwá thaü gai? *Where have you been.*

Hang man maü po, ma caü gai? *You beat him, did you not?*

Tán phú dĩ kiat kái? *Is this man angry?*

Kai kái, kaú kái? *Is it far or near?*

#### PARTICLES.

*Adverbs.* An adverb generally follows the word which it modifies, whether it be an adjective or a verb—

Manai, *to dry.*

Pelá, *when.*

Mangá, *yesterday.*

Ti lang, *afterwards.*

Sün, *the day before yesterday.*

Phé, *here.*

Maphok, *to-morrow.*

Han, Pún, *there.*

Tsaü, *early.*

Lang, *immediately.*

Meu tsaü, *early in the morning.*

Köi, *slowly.*

Nam, *first.*

Khin, *quickly.*

Lún, *last.*

Meün meün, *equally.*

Kia, *ever.*

Perá het, *wherefore.*

Mai kia, *never.*

Perá nan, *therefore.*

Sakti, *at once.*

The *Prepositions* in common use are :

Tí, *in, at, to.*

Kap, *with.*

Luk, *from.*

Neu, *upon.*

Kon, *after.*

Lum, *below.*

Nai, *in.*

Lang, *behind.*

Him, *near.*

Dang, *according to.*

Bón, *above.*

Tóngná, *in presence of.*

Hang, Thüng, *to, unto.*

Há mai, *without, destitute of.*

## The Conjunctions are—

Tak, Le, <i>and</i> .	Ik, <i>besides, moreover</i> .
Khau, <i>if</i> .	Ik lau, <i>yet again</i> .
Unkan, <i>unless</i> .	Tewá, <i>but, except</i> .
Perá, <i>because</i> .	Hu, <i>or</i> .

The construction of the language is simple and inartificial, adhering to what philologists term the *analogous* idiom, that is, ideas are expressed in the natural order in which they occur to the mind. The nominative regularly precedes the verb, and most frequently the verb precedes the case which it governs.

## SENTENCES.

The following sentences are introduced to exemplify the preceding remarks :—

Má hau, *The dog barks*.

Miau ta wám nú, *A cat will catch mice*.

Lapséng ko han pe, *She can see in the dark*.

Nók nai hong ma nai nyin gai? *Do you not hear that bird singing?*

Khai man maü pai lak, *Do not steal her eggs*.

Sang maü lak, tang wan man ta hai yau, *If you steal them, she will cry all day*.

Yong, luk on ní, *Yong is a good boy*.

Kau ma pin pe, man ma wá, *He does not say, "I cannot do" (it.)*

Kángháu lang nin nai phaü té má? *Who made the heavens and the earth?*

## THE LORD'S PRAYER IN KHAMTI.

Po tú khá, an ú nũ káng háu nai, nang cū\* máü cau, rósé kóyam haü, yang nui né; haü má té mán, té mǔng maü cau, nui né; nang aló maü cau, khaü caü nũ fâ káng háu pyé zóng nang hũ ko, lang nin mǔng káng haü, pin nang nan ta khá tá. Hang hau manai cậ kin haü nui ta khá tá. Kun phit hang hau nai hau poi nang hũ ko, apet tú khá khaü poi haü many nan ta khá tá—Apet kyám nai hang hau pai haü com; tí hái tí yák poi lot haü nui ta khá tá.

## THE SINGPHO.†

The territories occupied by the Singphos extend from the Patkoi range to the Brahmaputra, or from the 27° to the 28° N. Lat. and from

\* C is sounded as in Czar, or like Ts.

† My acknowledgments are due to the Rev. M. Bronson for the kind assistance received from him while drawing up the following remarks.

the frontier of Asam to the Langtang mountains on the east. Their language is common to numerous tribes occupying all the northern portions of the Burmese empire. About one fourth of its vocables are allied to the Burmese, and an equal proportion to the dialect of Manipur. Its intonations are similar to those of its cognate, the Burmese, and its grammatical construction precisely the same. It is peculiar for its combinations of consonants, many of which would at first sight appear quite unpronounceable to a European. It has properly no numbers, cases, nor flections in its nouns; nor conjugations, moods, tenses, or persons in its verbs. Many words have a substantive, adjective, or verbal signification, according to their position in a sentence; but in general, the names of objects, qualities and actions are sufficiently distinct from each other. Hence, in its structure and expression, the language is exceedingly simple.

#### OF NOUNS.

Cases are usually denoted by post-positive particles. As in all languages, the Nominative is the noun in its simple state.

The Genitive is sometimes denoted by its position before another noun, but more frequently by the particle Ná, put after it. As in Kansu-ná rung, or Kansu rung, *a cow's horn*.

The Dative case is usually marked by the particle Fe; though it is not unfrequently omitted when the noun is used before a verb signifying *to give*, &c. in which instance the case of the noun is sufficiently intelligible. *Exam*: Singpho óráwá ngai ngú yáhá, *I gave that man rice*. Ngai-fe lik náng galóui nyádai, *You never gave me a book*.

The Accusative case is the same as the nominative, distinguished only by its position in a sentence. *Exam*: Náng mumúng miríhá í? *Did you buy the mangoes?* Ora kansú cu nyádai, *That cow does not give milk*.

Under the case generally termed the Ablative, is included a variety of ideas, distinguished in Sanskrit by the Instrumental, the Locative, and the Ablative. These may all be expressed in Singpho by the use of post-positive particles.

Mbá, *a cloth*. Mbái kacúlú, *Wipe it with a cloth*.

Sirá, *place*. Khiná sirá-i-dáu, *Put it in its place*.

Simí, *a lamp*. Simí-goí namán datu, *Put oil into the lamp*.

Sometimes the particles are omitted: as in Ndí ncín datu, *Fill the pitcher (with) water*.



A Singpho noun admits of no change to indicate the plural number. Except where the noun itself expresses a plural idea, a numeral adjective is usually added.

Nor are there any traces of a distinction of gender by the use of terminal affixes. Yet the language is not entirely destitute of substantives descriptive of the gender. In the case of human beings gender is usually distinguished by distinct terms : as in

Singpho, <i>man</i> .	Númsyá, <i>woman</i> .
Wá, <i>father</i> .	Nu, <i>mother</i> .
Máng, <i>boy</i> .	Síwí, <i>girl</i> .

In the case of the inferior animals, the words Lasa, *male*, and Núm-sá, *female*, are added to the specific terms.

#### OF ADJECTIVES.

The position of an adjective in a sentence is invariably after the noun it serves to qualify.

Ncin punglúm khoṃ, *pour (in) hot water*.

Singpho kunkhán galóui-mung nsú-á.

*An idle man never can be rich.*

As the language rejects terminations of every kind, it of course has none to mark the degrees of comparison. Comparisons are therefore made by particles expressive of number or quantity.

Ngai sindi báhá, *I am very weary*.

Ndai latai gráudai, *This is the greatest of all*.

#### NUMERALS.

The Singpho numerals are—

- |            |           |           |           |           |
|------------|-----------|-----------|-----------|-----------|
| 1. Aimá.   | 3. Masúm. | 5. Mangá. | 7. Sinit. | 9. Cekhú. |
| 2. Nkhong. | 4. Melí.  | 6. Krú.   | 8. Macat. | 10. Sí.   |

After which the ordinals are repeated and compounded.

11. Sí-ai.	100. Lat-cá.
12. Sí-nkhong.	200. Ní-cá.
13. Sí-masúm, &c.	300. Masúm-cá.
20. Khún.	400. Melí-cá.
21. Khun-ai.	500. Mangá-cá.
22. Khun-nkhong, &c.	600. Krú-cá.
30. Tumsí.	700. Sinit-cá.
40. Melí-sí.	800. Macat-cá.
50. Mangá-sí.	900. Cekhú-cá.
60. Krúsí.	1000. Hing.
70. Sinit-sí.	10,000. Mun.
80. Macat-sí.	100,000. Sen.
90. Cekhú-sí.	

## OF PRONOUNS.

The Personal pronouns are Ngái, *I*, Náng, *Thou*, and Khi, *He*, *She* or *It*; the specific signification being distinguished only by the connection in which it stands. Distinct terms are used to express the plural number. *I*, *we*; Nithen, *ye*; and Khini, *they*.

The variations of *cases* are indicated in the same manner as in the case of substantives.

The *Possessive* pronouns are the same as the personal, with the genitive particle affixed.

The *Relative* pronouns are, Gadaimá, *who*; and Gadémá, *which*; used also in an *interrogative* sense, with Phakaimá, *what*?

The *Demonstrative* pronouns are, Ndai, *this*; and O'rá, or O'ráwá, *that*.

## OF VERBS.

The moods and tenses of verbs are expressed by means of particles, or significant words.

## INDICATIVE MOOD.

*Present tense.* The verb in its simple state is often used as the form of the present tense, Ngái dúp, *I strike*. Khi sú, *He speaks*. The verb Dai, *to be*, is sometimes added as an auxiliary. Ngái dup-dai, *I strike* or *am striking*. Ngái sú-dai, *I speak* or *am speaking*.

*Past tense.* This tense is denoted by the particle há. Thus Khi dúp-há, *he did strike*. Náng sú-há, *thou didst speak*.

*Perfect tense.* Here the particle há, and the verb dai are conjoined. Thus, Ngái dúp-há-dai, *I have struck*. Náng sú-há-dai, *thou has spoken*.

*Future tense.* The particle á added to the verb denotes future time. Khi dúp-á, *he will strike*. Ngái sú-á, *I will speak*.

The Infinitive Mood, or more properly, the Gerund, is indicated by the addition of the particle Ijóí, *for, for the purpose of*. Dúp-ijóí, *to strike*. Sú-ijóí, *to speak*.

## Participles.

*Present.* Dúp-yang, *striking*. Sú-yang, *speaking*.

*Past.* Lángdi, *having taken*. Sú-ngdi, *having spoken*.

The Imperative Mood is formed by the addition of the particle U', to the root of the verb. As in commanding, it is obvious it is only the 2nd person that is addressed, this mood may be said to exist only in that person.

Dúp-ú, *strike thou*.

Sú-ú, *speak thou*.

Prohibition is implied by prefixing the word Phung, or Kúm to the form of the imperative.

Phung dúp ú, *do not strike.* Kúm lug-ú, *do not steal.*

Negation is expressed by the suppressed sound of the letter N ; put before the verb in its different tenses. Ngái ndúp-dai, *I do not strike.* Ngái ndúp-há, *I did not strike.* Ngái ndúp-á, *I will not strike.*

#### POTENTIAL MOOD.

When *power* or *capacity* is intended to be implied, the word Ngutá, *able*, is added to the root of the verb.

Ngái dúp ngutá, *I can strike.* Khi sú ngutá, *he can speak.*

In the negative form it becomes Ngái dúp n-ngutá, *I cannot strike.* Khi sú n-ngutá, *he cannot speak.*

*Desire* is expressed by the verb Rá, *to wish*, put between the root of the verb and the auxiliary.

Ngái dúp-rá-dai, *I wish to strike.* Khi sú-rá-dai, *he desires to speak.*

*Interrogation* is implied by the particle I, added to the verb, provided the verb ends the sentence.

O'rá wá ning-chin-dai, Náng aká-í? *That bird sings, do you hear (it) ?*

Náng-ne ngkhrítá í? *Do you dread (it) ?*

When there is no verb in the sentence the interrogative particle Má is commonly used.

Ndai lik gadémá má? *Whose book is this?*

These particles are omitted when any other word in the sentence implies interrogation.

Náng khi-fe pharai dup-há-dai? *Why have you struck him?*

#### Particles.

*Adverbs* in Singpho usually precede the verbs they serve to qualify.

Gáláu, *quickly.*

Gáláu di-ú, *do it quickly.*

Lúimá, *a little.*

Lúimá khríng-ú, *wait a little.*

Aidi, *well.*

Aidi dúng-ú, *sit prettily.*

Nong-nong, *daily.*

Nong-nong ngái-fe tsu rá-dai, *I want milk daily.*

Leni khringi, *every other day.*

Leni khringi joi ngái fe wá rá-dai, *I want a pig every other day.*

O'rate, *yonder.*

O'rate phung sá-ú, *do not go yonder.*

Tukhui, *in.*

Tukhui lúng-ú, *come in.*

Singándi, *out.*

Singándi prú-ú, *go out.*

Gadé, *how much, or how many.*

Nána mumúng gadé ngá? *how many mangoes have you?*

The Prepositions of occidental languages are, in Singpho, rendered by *Post-positive particles*.

#### SENTENCES.

Maráng tú-á, *it will rain.*

Chong lá-ú, *bring an umbrella.*

Ján já pyou-dai, *the sun is very hot.*

Nána lágóng gágri cúdai, *your feet are very dirty.*

Khái sáu kicinu, *go to the river and wash them.*

Náng phakai mungli dí ngutá? *what work can you do?*

Náng phakaimá ngúdai? *what do you say?*

Ngaiea gá sú-yango, náng phung sú-ú, *when I am speaking, do you not talk.*

Nána munglí dí phung maláp-ú, *do not forget to do your work.*

Ngaina lettá ketsin yang, khi sá hádai, *he went when I was washing my hands.*

Nána liung ningdung khái midit-ú, *dip the end of your finger in water.*

Ngai sigá yángo gáláu sáu, *when I call come quickly.*

Nangi ntséng yángo, khi madún-á, *if you do not know he will show you.*

Phrá aimá ngá-dai, *there is one God.*

Phrá ndai mú sijo há-dai, *this God built the heavens.*

Khi ngá sijo-hádai, *he created the earth.*

Ngai-fe, náng-fe, singpho yong-fe khi sijo-hádai, *he made me and you and all men.*

Phume ketsing, tso-de bum, khá-nu gubá, jan, *the green tree, the high hill, the great water, the sun.*

Sítá, sigan túdai, sijo-hádai, *the moon, the shining stars, he made.*

Yong sera-í mú-dai, *he sees in all places.*

Ningthó-i múdai sat, ningtsi-ni mang múdai, *as he sees in light, so he sees in darkness.*

Náng di-dai theng, khi yong chéng-dai, *whatever you do, he knows all.*

#### THE NAGA.

That large extent of mountainous country, bounded on the west by the Kopili river, the great southern bend of the Barak, and the eastern frontier of Tipperah, in nearly east longitude 83°; on the north by the valley of Asam; on the east and south-east by the hills dividing Asam from the Bor-Khamti country in longitude 97°, and the valley of the Kyendrens; and on the south by an imaginary line, nearly correspond-



ing with the 23rd degree of north latitude, is inhabited by numerous tribes of Highlanders, known to the Asamese by the general name of Nagas. Whatever may be the origin of the word, it appears that the appellation is entirely unknown to any of the hill tribes themselves. They are divided into numerous communities or races, and they know themselves by the designations of their respective tribes only, and not by any name common to all the races.

There appear however to be some marks by which these tribes are distinguished from their neighbours, and some common ties by which they are all bound together as one people, though at present divided into tribes by a diversity of dialects. These dialects are sometimes so different that two adjoining tribes cannot converse together, except through the medium of a third dialect common to both; yet they are said to intermarry and form connexions and alliances with each other, which they do not do with tribes not belonging to the Naga community.

The Nagas also appear in general to be distinguished from their neighbours by physical conformation; for though there is much difference in this respect amongst them, yet they are in common remarkable for extremely coarse, savage countenances, and dull, timid, heavy dispositions.

My investigations, for the present, have been confined to the dialect spoken by the Námsángiyás, a tribe occupying the hills near the sources of the Boori Dihing river. To the Rev. Mr. Bronson of Nowgong, I am indebted for the valuable aid he has afforded me in these enquiries.

#### OF NOUNS.

Comparatively copious as is the grammatical apparatus of this language, it possesses no affixes by which to designate the cases of its nouns.

The Genitive case is denoted merely by the juxta-position of the two substantives, the former being understood to be in the genitive.

Kien ngiupo phyet-ó, *Milk the goat, (or literally,) draw the goat's milk.*

In the other oblique cases, the noun is followed by the distinguishing adjunct, Nang; sometimes with, though more frequently without the addition of a post-positive particle.

Ham-nang vanró, *Bring a mat.*

Ira minyáng-nang láko-tak, *I gave it to that man.*

Sán-nang lam-ó, *Put it in the sun.*

Jó-nang Kien-ó, *Fill it with water.*

The particles Má and Pá are frequently used as affixes to nouns singular, but they seem to be merely euphonic, and have no definite signification attached to them.

The particle He, is employed in the same manner, but only in cases where plurality is implied. It is, however, often omitted; and then the plural number is distinguished by the collective or plural idea expressed by the noun, or by the addition of a numeral adjective.

The difference of gender in individuals of the human family is denoted by distinct terms; in the case of all other animals, the appellatives Póng, *male*, and Nyóng, *female*, are added to the noun.

*Masculine.*

*Feminine.*

Mi-nyán, *man.*

Dehiek, *woman.*

Delá, *husband.*

Tang-nyú, *wife.*

Vá, *father.*

Ing-yong, *mother.*

Iphó, *brother.*

Ing-yáh, *sister.*

Mán-pong, *a bull.*

Mán-nyóng, *a cow.*

Hú-pong, *a dog.*

Hú-nyóng, *a bitch.*

Kien-póng, *a he-goat.*

Kien-nyóng, *a she-goat.*

OF ADJECTIVES.

In composition, an adjective invariably follows the noun it serves to qualify.

<sup>1</sup>Írá <sup>2</sup>kien <sup>3</sup>ngui-po <sup>4</sup>asan <sup>5</sup>ko-á, <sup>1</sup>that <sup>2</sup>goat <sup>5</sup>gives <sup>4</sup>good <sup>3</sup>milk.

Adjectives in this language admit of no variations expressive of number, case, or gender, or even of the degrees of comparison. But as the comparison of one person or thing with another so as to ascertain the relative quality possessed by each, must necessarily exist in every language, we find that the general mode of forming comparison among the Námsángiyás, is merely by placing the adjective after the noun with which the comparison is made, the noun being put in the oblique form. Ngámá íra mi-nyán-nang áló, *I am taller than that man*, or literally, *I that man tall.*

Ngámá íranangmá ajá ilamang, *I want more than that.*

Jó or Linjó is often added to an adjective to express a quality as existing in the highest degree.

Ira dehiék phangsán jό, *that woman is very handsome.*

Ará arimá asán linjό, *that fruit is exceedingly nice.*

#### NUMERALS.

The numeral system of the Námsángiyás is emphatically decimal—of the ten fingers. Thus they count.

1. Vánthe. 3. Vánram. 5. Bangá. 7. Ing-it. 9. Ikhu.

2. Ványi. 4. Belí. 6. Irók. 8. Isat. 10. Ichi.

and then throwing their fingers in an imaginary heap they exclaim, Ruak, *a decade.*

11. Ichi vanthe, 10+1. 20. Ruak nyi, *two decades.*

12. Ichi vanyi, 10+2. 30. Ruak ram, *three decades.*

13. Ichi vanram, 10+3, &c. 40. Ruak beli, *four decades.*

and so on till they come to Chá, *a hundred.*

100. Chá-the. 300. Chá ram, &c.

200. Chá-nyi. Chá ichi, *ten hundred or 1000.*

#### OF PRONOUNS.

The *personal* pronouns are, Ngá, *I*; Nang, *thou*; and Ate, *he, she, or it*. As the pronoun, is next to the verb, the most important part of speech, and that from which the verb chiefly derives its precision, we find in this language the use of distinct terms to express the plural number. They are, Nimá, *we*; Nemá, *ye*; and Sening, *they*.

In, what we have termed, the oblique form, these pronouns take the particle Nang after them, as in the case of nouns.

Ngánang.

Nangnang.

Atieng.

Nimánang.

Nemánang.

Seningnang.

Atieng, appears to be merely a contracted form of Ate-nang, the one term is as commonly used as the other.

The *possessive* pronouns are I', *my* or *our*; Má, *thy* or *your*; and Á, *his*, or *their*. They are invariably used before the nouns with which they are connected.

Arápá í lách, *this (is) my kite*

Mámá vá ngyóng-nang veó, *honour thy father and mother.*

In this sentence the first syllable má, is the pronoun, the second euphonic particle.

Anáppá ajun jό, *his hair (is) very soft.*

The particle ráng, is often added to the above pronouns.

Íráng mók itongá, *the horse is mine.*

Áráng hum itongá, *the house is his.*

The *demonstrative* pronouns are, *Árá this* ; and *Írá, that*, with their plurals *Áráhe, these*, and *Íráhe, those*. They precede the nouns they serve to point out.

*Írá khat-pá ílamang, I want that cloth. Árá-pá jo-kó, drink this water.*

The *interrogative* pronouns are *Haná or Hanmá, who ?* and *which ?* and *Chenná, what ?*

### OF VERBS.

The *Námsángiyá* verb appears to be the most interesting part of its grammar. It has but one form of conjugation, and the various modifications of an action are expressed by the addition of terminations to the verb expressing the action. The terminations are the same in both the singular and the plural numbers.

#### Thien, TO PUT.

##### INDICATIVE MOOD. *Present tense.*

1. Thien-ang, *I put.* 2. Thien-ó, *thou puttest.* 3. Thien-á, or é, *he puts.*

*Past tense.* 1. Thien-tak, *I did put.* 2. Thien-tó, *thou didst put.* 3. Thien-tá, *he did put.*

*Perfect tense.* 1. Lá-thien-tak, *I have put.* 2. Lá-thien-tó, *thou hast put.* 3. Lá-thien-tá, *he has put.*

*Future tense.* 1. I-thien-ang, 2. I-thien-ó, 3. I-thien-á, or é. *Gerund.* Thien-ráng. *Participle continuative.* Thien-limá, or lámá.

The *Imperative* form is the same as that of the 2nd person *Present tense*.

When it is necessary to give a *conditional* or *subjunctive* force to the verb, the particle *O'kó* is affixed to the verb in its various forms.

Thienang ókó, *if I put.* Thienó ókó, *if thou put.* Thiená ókó, *if he put, &c. &c.*

The *potential* form, used to express power or ability, is denoted by the use of the verb *Tá, to be able*, as an auxiliary.

Tá thienang, *I can put.*

In conjunction with this form of the verb, we find a peculiar use made of the *possessive*, instead of the *personal* pronoun. Thus instead of saying *Ngá tá-thienang, I can put.* *Nang tá-thienó, thou canst put,* we find the conventional form to be,



1. Itá thienang, *I can put*. 2. Mátá thienó, *thou canst put*. 3. Átá thiená, *he can put*.

The negative form is denoted by the addition of the negative particle Mak, to the auxiliary verb.

1. Itá mak thienang, *I cannot put*. 2. Mátá mak thienó, *thou canst not put*. 3. Átá mak thiená, *he cannot put*.

When the *necessity* of an act is to be expressed, Thing is compounded with the verbal root.

Ngá thien thing, *I must put*. Nang thien thing, *thou must put*. Ate thien thing, *he must put*.

*Prohibition* is expressed by the use of the negative particle Mak, or Nak, immediately before the verbal root.

Má dak nak sakó, *do not lay your hand (on it)*.

Inang mak kánó, *do not go there*.

To express simple *negation* the particle Mak, or Mă is put after the root of the verb.

Árá hú-má kak má, *that dog does not bite*.

Á ingyong-má kómă-tá, *his (or her) mother did not give (it)*.

Minyán moót ahó dang-mă-okó, *if the man has not any work*.

*Interrogation* is denoted by the particles ne, á, or le added to the end of the sentence.

Jó aló le? *is the water deep?*

Nang-má chenná lam-ó á? *what do you seek?*

Májá nang sóijáng mă luto ne? *did you not catch a pea-fowl yesterday?*

#### OF ADVERBS.

Adverbs are used to qualify verbs and adjectives ; and in composition they usually precede the verb, and follow the adjective.

Áchánmă, *fast*. Áchánmă lu-ó, *hold fast*.

Jó, *very*. Írá natá-ma alang jó, *that boy (is) very cross*.

Tájá, *to-day*.

Há ló, *afar*.

Ni-nap, *to-morrow*.

Rangjánang, *in the evening*.

Májá, *yesterday*.

Rankhánang, *in the morning*.

Dokko, *now*.

Khorók, *quickly*.

Ánang, *here*.

Aré, *slowly*.

Inang, *there*.

## The CONJUNCTIONS are

Íroková, *and*.Íróókomin, *but*.Min, ákomin, *also*.Cherángmá, *for, because, &c.*Okó, *if*.

POST-POSITIVE PARTICLES are used in this language in the same manner as the prepositions of occidental tongues.

Pungmá, *with*. Nyunang, *within*. Akhan, *under*. Vá, *from*.

Nyu, *in*. Khonang, *upon*. Dumnang, *by means of*.

## SENTENCES.

Rang i-pathá, *It will rain*.

Khat-húp vanró, *Bring an umbrella*.

Sán-má lang-má sai hang, *The sun is very hot*.

Má dánang mak achang jo, *Your feet are very dirty*.

Jónang kál-o má suan-o, *Go to the river and wash them*.

Nangmá chen móot i-ta-móo? *What work can you do?*

Nangmá chen ngait-o? *What do you say?*

Ngámá ngin mathu mathóithak, iraphímá nang nak thó thóo, *Do not talk when I am speaking*.

Nangmá móot moot ráng nak lakó, *Do not forget to do your work*.

Ngá idak matúmá suantak, até lá-ká-tá, *He went when I was washing my hands*.

Má dak sútúnpá jó-nang lúmsú-ó, *Dip the end of your finger in water*.

Nangmá ma jet-kóko, até má chen i-khésaká, *If you do not know then he will show you*.

Katakrang ván the itóngá, *There is one God*.

Írá katakrang-pá rang tiek-tá, *This God built the heavens*.

Até-má há min tiek-tá, *He created the earth*.

Ngá, nang-nang, hueri minyán nang tiek-tá, *He made me and you and all men*.

Bang áhing há hó acúong, jó a dóng, sán, dáfe, mérik achúm, tiek-tá, *The green tree, the high hill, the great water, the sun, the moon, the shining stars, he made*.

Phang-tang lát-nang ekhe-á, *He sees in all places*.

Rangvonang maró ekhé-á, rang-nyak-nang min iro ekhé-á, *As he sees in light, so he sees in darkness*.

## THE LORD'S PRAYER.

Ira ní rang nang tongte Vá, má ming pujá chen dánhá, ma nok ngýarang chen sóngá; rang nang maróá, íróá há-nang madákú chen sóngá. Tejá ní aphak acháí nínang kóhi. I'roková ní thá-pétenang nímá marórang lietang, irarangrang ní thápé pá tinghi. Nínang tóam-nang nak káthi, íková nínang cham chó túkó pamhi; chenmá róantang róanjang nok, ákomin chan, akomin móhimá, uráhé maráng, író chen dánhá.

## THE MIKIR.

The Mikirs occupy a tract of hilly country situated within the boundaries of the District of Nowgong in Central Asam, which covers an area of about 1710 square miles. Besides the unmixed communities that occupy these hills, numerous families of Mikirs are scattered all over the south bank of Lower Asam. They are always changing their locations; seldom continuing above three or four years in one place; and are mostly employed in cultivating the land for rice and cotton.

At the lowest computation the entire population of the Mikirs may be estimated at about 26,000 souls.

Living as they do in a rude state of society, and possessing no written language, it is no easy matter to trace their origin. They have a tradition that their ancestors originally came from the Jaintia hills; which might be assumed to be correct, from the circumstance of their having a few Jaintia words mixed up in their vocabulary. I have had no opportunities yet of making any comparison between the two languages. This task I reserve for a more convenient season.

The sounds of the Mikir language are pure and liquid, and in a great measure devoid of gutturals or strong aspirates. A slight nasal inflection and an abrupt cadence common to many of the vocables, are peculiarities this language possesses in common with all the Indo-Chinese monosyllabic dialects.

## OF NOUNS.

Nouns admit of no variations expressive of *number*; the plural state is generally defined by a numeral, or some other word expressive of quantity. Thus, Árleng, *a man*. Ápánáng árleng, or Ákó-óng árleng, *many men*.

Ácharong, *a cow*; Jónphungó áchorong, *five cows*.

Nor are the accidents of *case*, distinguished by any inflections or dif-

ferences of termination. The Genitive case is denoted merely by the juxta-position of the two substantives; the former being understood to be in the genitive case.

Oi áti, *a bird's nest*. Jálong ánu<sup>1</sup>k, *a buffalo's horn*.

The Accusative is the same as the nominative, and is distinguished only by its position in the sentence.

The other relations of nouns are marked by the use of post-positive particles.

Yok, or Ayok is most commonly used to mark the person receiving, or as the Dative particle.

Ne<sup>1</sup> mú<sup>2</sup> áyok<sup>3</sup> tárámo, *I have called my brother*.

Ár<sup>1</sup>weng ne<sup>2</sup> yok<sup>3</sup> pí<sup>3</sup>, *Give me a feather*.

The Ablative is expressed by the particle Pára, or Rem-pára; and the other cases are denoted by corresponding significant particles as in English.

Gender, in individuals of the human family, is marked by the use of distinct terms.

Pensó, *man*. Ápinghán, *husband*. Apó, *father*. Áte, *brother*. Ymu, *ditto*.

Árlossó, *woman*. Ápisó, *wife*. Áió, *mother*. Báí, *sister*. Ingjil, *ditto*.

In the case of the inferior animals, the appellatives Alo, *male*, and Ápe, *female*, are added to the noun.

Ingnár, *an elephant*, *Mas*. Ingnárálo, *Fem*. Ingnarápe.

Musung, *a deer*, *Masc*. Musungálo, *Fem*. Musungápe.

Kipi, *a monkey*, *Masc*. Kipiálo, *Fem*. Kipiápe.

Nouns derived from verbs, usually have the particle, “po” affixed to the original form of the verb. Thus, from Kichiháng, *to beg*, we have Kichihángpo, *a beggar*.

#### OF ADJECTIVES.

Adjectives do not alter their terminations to express either number, case or gender. They always follow the nouns they qualify.

Áláng kánsám, *cold water*. Lek áklak, *white beads*. Áso kángtuk, *a fat boy*.

Grades of quality are denoted by the particles Si and Sat subjoined, or by such words as Árlo, and Játsi, put before the adjective. Comparison, whether expressed by distinct words, or incrementory particles, is unknown to the language.



Ákleng, *great*. Ákengsi, *very great*. Árlo ákleng, *exceedingly great*.

Ákiding, *long*. Ákidingsat, *very long*. Ngodáh, *bad*. Játsi ngodáh, *thoroughly bad*.

The mode of numeration that obtains among the Mikirs, presents us with a few interesting peculiarities.

#### THE NUMERALS are

Ichi, .. ..	1.
Hini, .. ..	2.
Katham, ..	3.
Phili, .. ..	4.
Phong, .. ..	5.
Thorok, .. ..	6.
Thorchi, ..	7. this is Thorok 6, and Ichi 1=7.
Nirkep, .. ..	8. literally 10—2=8.
Chirkep, ..	9. „ 10—1=9.
Kep, .. ..	10.
Then follow Kepáichi ..	11, or 10 + 1.
Kepáhini, ..	12, or 10 + 2, and so on till
we come to Kepákep, ..	20, or 10 + 10, which is also
expressed by Ingkol, . . .	<i>a score</i> . Then follow
Ingkol-ichi, .	21.
Ingkol-hini, .	22.
Ingkol-katham, ..	23, &c., till we come to the third
decade, Katham-kep, ..	30, or 3×10.
Hini ing kol,	40, or <i>two score</i> .
Hini ingkol lá kep,	50, or <i>two score plus ten</i> .
Phár, .. ..	100.

The above numerals as far as *six*, that is all the simple ones, it will be observed, assimilate to those in use by the Gáros, and are most probably to be traced to the same origin. It is also worthy of remark, that the peculiarity noticed in the use of the Gáro numerals, as applied to men, to inferior animals, and to inanimate things, exists also in the specific application of the Mikir cardinals.

When enumerating individuals of the human family, the word *Báng* is prefixed to the numeral. Áte báng hini, *two brothers*.

When the numeral is applied to any inferior animal, the word *Jón* is used instead. Jón phongo áchorong, *five cows*.

And Hong, and Páp, are indiscriminately prefixed to numerals when applied to inanimate objects.

#### OF PRONOUNS.

There is no distinction of Gender in the pronouns of this language. In the case of the 1st and 2nd person, the sex is supposed to be known, and in the 3rd person it must be inferred by a reference to its antecedent.

The Personal pronouns are—

<i>Singular.</i>	<i>Plural.</i>
Ne, <i>I.</i>	Áli, <i>we.</i>
Náng, <i>thou.</i>	Náli, <i>you.</i>
Alang, <i>he, she, it.</i>	Ánáli, <i>they.</i>

The relations of *cases* are denoted in the same manner, as already exemplified with reference to nouns substantive.

Ne ne sál inghol, *I do my work.*

Ne yok ság biso he, *give me a little rice.*

The Demonstrative pronouns are Lápen, the proximate, and Ilápen, the remote. These are reduplicated to denote the plural. Lápen lápen, *these.* Ilápen ilápen, *those.*

The Interrogative pronouns are Inghone, *who?* and *which?* and Mpópi, *what?*

Relative pronouns are very vague, indeed I am not aware of the existence of any; the sentence being generally so rendered as to obviate the necessity of them. Thus, instead of saying “the man who went,” a Mikir would say, Árleng gidám, *the gone man.*

#### OF VERBS.

The various kinds of verbs in this language must be denominated wholly from their meaning and signification, as active, passive, neuter, causal, &c.

The Indicative Mood, is the verb in its simplest state, unconnected with any other to modify its operation.

The relations of time are expressed by affixes, except in the *present tense*, which may be taken as the root of the verb.

Verbs undergo no modification consequent on number or person.

*Present tense.* Ne doh, *I am*; Náng doh, *thou art*; Áláng doh, *he is.*

Áli doh, *we are*; Náli doh, *ye are*; Análi doh, *they are.*

And so in the case of any other verb.

Ne Cho, *I eat*. Ne Inghol, *I do*. Ne Dá, *I go*.

*Present definite*. Ne Chodoh, *I am eating*. Ne Ingholdoh, *I am doing*. Ne Dámдох, *I am going*.

*Past tense*. Ne Cho lóh, *I did eat*. Ne Inghol lóh, *I did do*. Ne Dámoh, *I did go*.

*Future tense*. Ne Choye, *I shall eat*. Ne Ingholye, *I shall do*. Ne Dámye, *I shall go*.

*Future*, implying a determination, Ne Cho bó, *I will eat*. Ne Inghol bó, *I will do*. Ne Dá bó, *I will go*.

*Future*, a more expressive form. Ne Cho báng, Ne Inghol báng, Ne Dám láng.

The Gerund is denoted by prefixing Ki, and adding Ayok to the root of the verb.

Ki-cho-áyok, *to eat, for the purpose of eating*.

Ki-inghol-áyok, more frequently contracted into Nánghol-áyok, *to do, for the purpose of doing*.

Ki-dám-áyok, *to go, for the purpose of going*.

#### PARTICIPLES.

*Present*. Chosi, *eating*. Ingholsi, *doing*. Dámsi, *going*.

*Past*. Cho po, *having eaten*. Inghol-po, *having done*. Dámpo *having gone*.

*Continuative*. Chosido chosido, *continuing to eat*. Ingholsido, *continuing to do*. Dámsido dámsido, *continuing to go*.

The Imperative Mood, is used only in the 2nd person.

The simple verb in the present tense, 2nd person, is often used in an imperative form.

Náng Cho, *eat thou*. Náng Inghol, *do thou*. Náng Dám, *go thou*.

Sometimes the particle Noh, is added to give more force to the command.

Cho noh, Inghol noh, Dám noh.

Prohibition is denoted by the use of the particle Ne after a pronoun, or Ye, after a verb. Thus,

Cho náng ne, *eat thou not*. Cho ye, *eat not*.

Inghol náng ne or Inghol ye, *do it not*.

Dá náng ne, or Dá ye, *go not*

The Potential Mood, expressing ability, capacity, &c. is denoted by the use of the word Un, *can*. Thus,

Ne cho un, *I can eat.* Ne inghol un, *I can do.*

Ne dám un, *I can go.*

Ne cho un ye, *I cannot eat.* Ne inghol un ye, *I cannot do.* Ne dám un ye, *I cannot go.*

Interrogation is implied by the particle Má, placed after the verb.

Náng án cholo má? *Have you eaten rice?*

Ne inghoáyok piye má? *To whom shall I give it?*

When any other word is introduced into a sentence rendering the interrogation clear and explicit, the particle Má, is omitted as unnecessary.

Náng ánga kodák dolo? *Where were you before?*

Simple negation is expressed by the particle Iong, introduced at the end of the sentence. It is sometimes changed into He.

Lebángso olángpi ók iong, *there are no fish in this river.*

Aláng ikotáng inghol he, *he does not do any thing.*

#### PARTICLES.

The prepositions used in occidental languages are in Mikir rendered by post-positive particles.

<sup>1</sup> Náng <sup>2</sup> dung <sup>3</sup> phurul <sup>4</sup> do, *there is a snake near you.*

<sup>1</sup> Ládág <sup>2</sup> párá <sup>3</sup> me <sup>4</sup> wán, *bring the fire from that place.*

Adverbs appear to be used indiscriminately either before or after the verbs to which they are joined.

Mon, Monon, *now.*

Mináp, *to-morrow.*

Aphel, *afterwards.*

Timi, *yesterday.*

Ádápráng, *early in the morning.*

Bibiso, *by degrees.*

Ánuethu, *in the evening.*

Láhe láhe, *slowly.*

Árnithu, *always.*

Dámsrak, *quickly.*

Mini, *to-day.*

#### SENTENCES.

Náng men mpó? *what is your name?*

Ne men ge Dómái, *my name (is) Domai.*

Náng bozáriyok dám lági, *you must go to the bazar.*

Náng ásipini mpot kágholo? *what have you done all day?*

Náng gethek po mpiyok thánthe? *if you know why do you not speak?*

Ne ekotáh thánthe iong ngo, *I did not utter a single word.*

Hem kikemáyok kopho lángno, *look for bamboos to build a house.*



Náng tirklong, ne tirklong kiding, *my spear is longer than yours.*

Wó wókák prege bi, *put the fowls and ducks apart.*

Iáláng-so a-bí áló má ápe? *is this a male or a female goat?*

Ne ngo do náng ne, *do not stand before me.*

Ne mu-áyok tárámo wángye iongó, *I have called my brother, he will not come.*

Aláng thándoh mináp wángye, *he says he will come to-morrow.*

Mináp ádápráng wáng noh, *come early to-morrow morning.*

Iwot árleng ásoopenso báng hini, *one man (had) two sons.*

Sopo ápi-biso ábitháng á-náng ápó-ayok tháloh, *the younger said to his father.*

Lá á-náng ápó, *O! my father!*

Ne ápó á-dhon á-bhág netá hrong he, *give me the share of my father's wealth that falls to me.*

Aláng ápó lá á bolór ji dhon kádák kiding láprak-e thág loh, *his father then divided between them his wealth and substance.*

Timi timidi nigán hini nigan githom, *after a few days.*

Lá á párá ásoपो ámuso jidhon kádák kiding ensi deh sári dámo, *the younger son taking his wealth and substance departed thence to a far country.*

#### THE KASSIA.

The tract of mountain territory inhabited by the Kassias borders on Kachar to the east; the district of Sylhet to the south; the Garo hills to the west; and the valley of Asam to the north. It forms an irregular parallelogram, the length of which, from north to south, may be assumed at about 70 miles, and its average breadth at 50, giving an area of about three thousand five hundred square miles.

The language spoken by the Kassias is very simple both in structure and expression; but it abounds with those intonations that form so striking a feature in the languages allied to the Chinese. The short, abrupt sound at the termination of a word or syllable, is especially frequent. The Kassias are also very lavish of words to express their most common ideas, and often make use of terms very specific in their application. For instance the verb to wash, has no less than six synonymes in this language. Tet, *to wash the hands*; Batá, *to wash the face*; Sleh, *to wash the head*; Sum, *to wash the body*; Kling, *to wash a vessel*; and Sait, *to wash clothes*.

## OF NOUNS.

Nouns are of two genders, masculine and feminine, distinguished by their specific prefixes. U, denotes the masculine, and Ká, the feminine.

U tangá, *husband*.

Ká tangá, *wife*.

U hanmen, *elder brother*.

Ká hanmen, *elder sister*.

U párá, *younger brother*.

Ká párá, *younger sister*.

U skei, *buck*.

Ká skei, *doe*.

U klá, *tiger*.

Ká klá, *tigress*.

U Sier, *cock*.

Ká Sier, *hen*.

In a few instances, distinct terms are used to denote the male and female members of a family, as Kapá, *father*; Kami, *mother*. Yet the prefixes are seldom or never omitted.

U kapá, *father*.

Ká kami, *mother*.

U kapáná, *pat. uncle*.

Ká sangkenkha, *pat. aunt*.

U kaní, *mat. uncle*.

Ká kamíná, *mat. aunt*.

The feminine particle Ká, is prefixed to the names of most inanimate objects.

Nouns are the same in both numbers. The plural is distinguished by the use of the prefix Ki, in both masculine and feminine nouns.

U mon, *a man*.

Ki mon, *men*.

Ká sim, *a bird*.

Ki sim, *birds*.

Ká knám, *an arrow*.

Ki knám, *arrows*.

The various relations of nouns, usually termed cases, are represented in Kassia by prepositions.

The Genitive case is denoted by the particle Jong.

Ká karteng jong u mon. *The name of the man*.

Ki baniát jong u klá. *The tiger's teeth*.

When the particle is omitted, the case is indicated by the juxtaposition of the two substantives, the *latter* being understood to be in the genitive case.

Ká reng u bláng. *The goat's horn*.

The other cases of Sanskrit nouns are represented by such particles as, Iá, *to*; Ná, *from*; Bád, *with*; Há, or Shá, *in*; Háph, *into*, &c.

## OF ADJECTIVES.

Adjectives are generally placed after the nouns they serve to qualify.

U kanná bábhá. *A good child*.

U lúm bájerong. *A high mountain.*

Gradation, without comparison, is usually expressed by the word Eh, *hard*, put after the adjective.

U lúm bájerong eh. *A very high mountain.*

The comparative degree is formed by the word Khám, put before the adjective. And as adjectives, especially if used without a substantive, have generally the particle Bá prefixed, the word khám is usually introduced between the prefix and the adjective.

Bá klain, *strong.*

Bá khám klain, *stronger.*

Bá bhá, *good.*

Bá khám bhá, *better.*

Bájerong, *high or long.*

Bá khám jerong, *longer or higher.*

Ká súm jong ngá ká khám jerong iá ká jong phi, *my spear is longer than yours.*

The language has no definite form for constructing a superlative degree of comparison. The usual mode of expressing it, is by the use of the word Tám, *much*, in conjunction with khám, and placed after the adjective.

Bá klain khám tám, *strongest.*

Bá bhá khám tám, *best.*

Bá jerong khám tám, *longest or highest.*

#### NUMERALS.

The following is the cardinal series of numbers adopted by the Kassias :—

1. Wei.	13. Kád-lai.
2. Ár.	14. Kád-sáu.
3. Lai.	15. Kád-sán, &c.
4. Sáu.	20. Ár-phon, <i>two decades.</i>
5. Sán.	21. Árphon-wei.
6. Hinriu.	22. Árphon-ár.
7. Hinian.	23. Árphon-lai, &c.
8. Práh.	30. Laipon.
9. Kandái.	40. Sáupon.
10. Shipón or kád, <i>a decade.</i>	50. Sánpon, &c.
11. Kád-wei.	100. Shi-spáh.
12. Kád-ár.	1000. Shi-hájár.

The numerals generally stand before the nouns to which they are joined. Lai sngi, *three days.* Ki kádár mon, *twelve men.*

## OF PRONOUNS.

The personal pronouns are Ngá, *I*, Mé, or Phá, *thou*; U, *he*, and Ká, *she*; with their plurals, Ngi, *we*; Phi, *you*; Ki, *they*.

The accidents of *case* are marked by prepositive particles, as in the case of nouns.

The relative pronouns are Ei and Nah, signifying *who*, *which*, and *what*.

They are distinguished according to gender by the particle U, or Ká, prefixed. U ei, or U nah, *who*, masc.: Ká ei, or Ká nah, *who*, fem. The plural form is expressed by the plural prefix Ki, Ki ei, Ki nah.

The same terms are used as Interrogative Pronouns.

The demonstrative pronouns are Tá and Neh, which appear to be used indiscriminately for *this* and *that*. The particles U and Ká, are prefixed to indicate the masculine and feminine, and Ki, to denote the plural.

The indefinite pronouns are Unah unah, *whosoever*. Ká nah ká nah, *whatsoever*, or Kumnah kumnah.

## OF VERBS.

There is apparently but one regimen for the conjugation of all Kassia verbs, accomplished by the use of pre-positive particles, and which may be exemplified in the following paradigm.

Rakhi, *laugh*.

## INDICATIVE.

*Present tense.* Ngá rakhi, *I laugh*. N. B. Verbs admit of no variation on account of number or person.

*Past tense.* Ngá lá rakhi, *I did laugh*.

*Perfect tense.* Ngá lá lách rakhi, *I have laughed*. The verb Iah, *have*, is sometimes compounded with the verbal root. Thus, Ngá lá iah rakhi, *I have laughed*.

*Future tense.* This tense is marked by the addition of the letter N to the preceding pronoun.

Ngá n rakhi, *I will laugh*.

*A sort of Paulo-post-future*, Ngán sá rakhi.

The absence of any definite form for the Imperative Mood is supplied by the use of the present or future tense of the Indicative. Thus; Leit shá ká shnang, *go into the village*.



Hángtá ruh phin íáishang, *and stay there*, or literally, *there and you will stay*.

The Subjunctive Mood is formed by prefixing Ládá to the usual form of the Indicative. Thus ;

Ládá ngá rakhi, *if I laugh*. Ládá me rakhi, *if thou laugh*. Ládá u rakhi, *if he laugh*, &c.

The Potential Mood is denoted by the use of the word Láh before the verb.

Ngá lách rakhi, *I can laugh*. Ká lách rakhi, *she can laugh*.

*Gerund*. Bán rakhi, *to laugh, for the purpose of laughing*.

*Participle*. Dá rakhi, *laughing*.

*Prohibition* is indicated by the word Wát, put before the verbal root.

Wát tuh, *do not steal*. Wát kháng íá ki, *forbid them not*.

The sound of the letter M, is often used in composition, to express negation.

Ngim lá wállám u kán, *we did not bring the rice*.

Kim tet íá ki kti jong, *they wash not their hands*.

Besides the use of interrogative particles, the only sign to denote interrogation, is the raising of the voice at the end of the question, and giving to the last syllable a lengthened articulation.

U ei u tá? *Who is this?*

Don ai uh pat? *What lack I yet.*

U neh um u kúm jong u? *Is not this his son?*

#### PARTICLES.

Hábá, *then, at which time*. Handá kumtá, *at that time, when*.  
Man, Mannáh, *when, when?*

E/m, *no*.

Hadi in, *last*.

Shishá, *truly*.

Biáng biáng, *diligently*.

Shiwá, *first*.

*Conjunctions*. Ruh, *and*. Nábá, *for, because*.

Láne, *or* Ládá, *if*.

From the illustrations already furnished and those that follow, it will be observed that the Kassias make use of a large number of insignificant particles, most of which are merely euphonical. Such are Bá, Nah, Té, &c. : in addition to an apparently too prodigal repetition of the pronominal particles Ká and U.

## SENTENCES.

<sup>1</sup> Khat <sup>2</sup> iá <sup>3</sup> ngá, <sup>4</sup> bá <sup>5</sup> ngá <sup>6</sup> ruh <sup>7</sup> ngán <sup>8</sup> leit, *call to me, I and (even) I shall go.*

<sup>1</sup> Tád-lánoh <sup>2</sup> ngán <sup>3</sup> shong <sup>4</sup> bad <sup>5</sup> phi? *How long shall I stay with you?*

<sup>1</sup> Ká <sup>2</sup> tári <sup>3</sup> jong <sup>4</sup> nah <sup>5</sup> ká <sup>6</sup> neh? *whose knife is this?*

<sup>1</sup> Ká <sup>2</sup> neh <sup>3</sup> ká <sup>4</sup> ũng <sup>5</sup> u <sup>6</sup> kapá <sup>7</sup> jong <sup>8</sup> ngá, *this is my (of me) father's house.*

<sup>1</sup> Hangnoh <sup>2</sup> me <sup>3</sup> shong <sup>4</sup> manhanin? *where were you yesterday?*

<sup>1</sup> Ngá <sup>2</sup> lá <sup>3</sup> shong <sup>4</sup> há <sup>5</sup> ká <sup>6</sup> klau, *I was in the jungle.*

<sup>1</sup> Phá <sup>2</sup> lá <sup>3</sup> bá <sup>4</sup> m <sup>5</sup> já? *have you eaten rice?*

<sup>1</sup> U <sup>2</sup> lá <sup>3</sup> shim <sup>4</sup> ká <sup>5</sup> já <sup>6</sup> ná <sup>7</sup> ká <sup>8</sup> kti <sup>9</sup> jong <sup>10</sup> ngá, <sup>11</sup> u <sup>12</sup> lá <sup>13</sup> ai <sup>14</sup> ruh <sup>15</sup> ia <sup>16</sup> u <sup>17</sup> ksen, *he took the rice from my (of me) hand, and he gave it to the dog.*

<sup>1</sup> Ká <sup>2</sup> m <sup>3</sup> kám <sup>4</sup> shu, *she does no work.*

<sup>1</sup> M <sup>2</sup> don <sup>3</sup> dokhá <sup>4</sup> há <sup>5</sup> ká <sup>6</sup> wáh, *there are no fish in the river.*

<sup>1</sup> U <sup>2</sup> lá <sup>3</sup> phá <sup>4</sup> nah <sup>5</sup> iá <sup>6</sup> ki <sup>7</sup> shá <sup>8</sup> ká <sup>9</sup> klau <sup>10</sup> bá, <sup>11</sup> ki <sup>12</sup> lá <sup>13</sup> leit <sup>14</sup> nah <sup>15</sup> ruh, *he sent (to) them into the jungle, and they departed.*

## THE LORD'S PRAYER.

U kapá jong ngi u bá há baneng; long bakúid ká karteng jong mé.  
Wán ká hímá jong mé; long ká món jong mé há ká kandeu, kum bá há baneng; ái iá ngi mantá ká jing tám jong ngi ká bá biáng. Máp ruh iá ngi ká rang káng jong ngi kum bá ngi máp iá ki bá leh sniu iá ngi. Wát iálám ruh iá ngi shá ká bá panshoi, hinrei súmer iá ngi ná ká bás-niu. Nabá ká hímá, ká bor ruh, ká búrom ruh ki jong mé, hálá kartá. Amen.

The list of Khamti words given in the annexed vocabulary has been very kindly furnished by the Rev. N. Brown of Sibsaigor. For the Singpho and Námsángiyá Nágá words I am indebted to the kindness of the Rev. M. Bronson of Nowgong, and for the Kassia, to the Rev. T. Jones of Charrá-punji.

## Comparative Vocabulary, Part II.

English.	Khamti.	Singpho.	Namsangiyá Náagá.	Mikir.	Kassia.
Above	Kanlú	Ning tsáng	Akhó nang	Athák	Nájerong.
Air	Lóm	Mbung	Póng	Tomon	Bároh
All	Tanglóng	Yong	Phang tang	Ason	Ká jing bittár.
Anger	Tsau lút	Me tsin	Rinkhá	Xleng kithi	Játhu.
Answer	Top khan, Tingkhan	Pai su	Tsi tshák	Arjulá	Ká dakin.
Ant	Mót	Gágin	Lát chán	Miso	Ká kuám.
Arrow	Lim	Pelá	Taplá	Thál	Ki dapei
Ashes	Tau	Dap	Chye-no	Thuegho	Kalli
Ask	Thám	Sanu		Árju	(Pat.) Ká Sangkenká.
Aunt	Ok. A. (Pat.) Nitsau			Ánu (Mat.)	(Mot.) Ká kaminá.
	(Mat.)			Ánung	Ká Ingdong.
Back	Lang	Sing máng	Tam	Ngodáh	Bamunán.
Bad	Mazi	Ngai-á	Achí	Chul	Ká Barni.
Bag	Thóng	Mpheng	Khat tóng	Chek-kopho	(No generic term.)
Bamboo	Maimó	Kuá	Vá	Pási (Asam)	Ká Tukri, Ká Sháng.
Basket	Táng, Móng	Mung	Kuon shí	Lek	Ki kapi ing.
Beads	Poi	Kachi	Lik	Thoám-Thogoyám	U, or Ká Dingium.
Bear (n)	Mí	Tsáp	Sap bá		Niutamoh.
Beard	Nut	Ningpap		Chakbo	Sanpát, Dát, Shak.
Beat	Po	Dúpu	Vá-to	Tupchá, Tár	Ká Jingtiáh.
Bed	Kú	Laku	Li-áng	Piá-Piá	U or Ká Ngáp.
Bee	Phung	Lagát	Ngá	Kichiliáng	Pán.
Beg	Fon	Phiu	Chuó	Ipok	Ká Kapoh.
Belly	Tong	Kán	Vók	Kone	U Kuái.
Bettlenut	Mák mu	Támul	Kavé	Wó	U or Ká Sim.
Bird	Nók	Wú	Vó	Kor	Dát.
Bite	Káp	Wá-ü	Ka-ko	Khodák	Bá Katáng.
Bitter	Khóm	Khá	A-khá	Ákuk	Bá long.
Black	Nam	Cháng	An-yak	Áwi	Ká Snám.
Blood	Lüt	Sai	Hé	Tilong	Ká Lí ing.
Boat	Hü	Lí	Khu-on-khó	Íbáng	Ká Met.
Body	Tó	Khum	Sak		

Bone	Nuk	Áráh	Arape	Ká Shing
Bow (n)	Kóng	Do-ak-háp	Bátulu	Ká Rantá
Boy	Lukon	Natá	Oso, Och	U Kanná
Brass	Tóng lúng	Pitol, ( <i>Asam.</i> )	Pitol	Ká Arnong
Break	Phe, Hák	Ngu-ak sye to	Khánhok	Khein, Kadiáh, Pan-páit, ( <i>used specifically.</i> )
Bring	Aumá	Vanró	Wán	Wallám
Broad	Kwáng	Khá dòng	Áráng the	Bá jílán
Brother	Pitsái ( <i>elder</i> ), Nongt-sái ( <i>younger</i> ).	Iphó ( <i>elder</i> ), Nau ( <i>younger</i> ).	Áte ( <i>elder</i> ), Imú ( <i>younger</i> ) U Han-ben, Pará	( <i>elder</i> ) U Hanmen, ( <i>younger</i> ) U Hanben, Pará
Buffalo	Khwái	Lé	Chelong, Jáláng	U or Ká Shinreh
Burn	Tsai fái	Thakó	Phị	Ing, Tháng, Pluh, ( <i>used specifically.</i> )
Bury	Phang	Binó	Pep	Tep
Call	Hong	Ruó	Táram	Khot
Carry	Sóng	Kapkató	Pon	Kit, Báh, Ráh, &c.
Cat	Miau	Miang	Meng	Miau
Catch	Tseü	Luó	Nep	Kem
Cheek	Kem	Than	Ángom, Ikecheng	Ká Ngáp
Child	Luk	Natá	Och	Kunlung
Chin	Káng	Ká	Ábib	Ká Tamoh
Cloth	Phá	Khat	Phe	Ká Ján
Cloud	Kang phá, Mok	Phu am	Ungun	U Lohoh
Cold	Yen	Aki	Kángsám	Kreat, Pidjá, Dáittáh
Come	Má	Káro	Oáng	Allá, Wán
Cook (v)	Hung	Puonó	Pámen	Shet ( <i>properly to Boil</i> )
Copper	Tóng neng	Tám ( <i>Asam.</i> )	Tám	Ká Táná
Cow	Ngó	Kansú	Chorong	Ká Mássi
Crooked	Ngok	Mágo	Kenkwan	Kanriáng, Wiát, Dor Kallán
Crow (n)	Ká	Kokhá	Wák	U or Ká Tangáp
Cry	Hai	Khrápu	Choru	Iám, Laníar
Cut (v)	Tet, Khat	Kathámu	Thu	Ot



<i>English.</i>	<i>Khamti</i>	<i>Singpho.</i>	<i>Námsángiyá Nága.</i>	<i>Mikir.</i>	<i>Kassia.</i>
Dance	Ká	Manáu-u	Ru-ó	Ká	Shád
Dark	Napsing	Ning-ting	Rang-nyak	Ingting kok	Dum
Daughter	Luk ying	Syá	Dehiek chá	Asope	Ká Kun
Day	W'an	Ningthói	Rang-nyí	Anerlo	Ká Sngí
Deaf	Hán nók	Ná-phang	Nábá	Kang thong	Kallut
Deep	Lük	Sáng	Alú	Árnúg	Jillin
Die	Tái	Su	Ri-ó	Thup	Iáp
Dig	Khut	Thú-u	Thu-ó	Hi	Tih
Dog	Má	Gui	Hú	Jun	U Ksen
Drink	Kín nam ( <i>eat water</i> )	Lú-u	Jók-ó	Kreng lám, Ápreng	Dih
Dry ( <i>adj.</i> )	Heng	Tsi kro	Chuoklam	Wo-Kák	Raktáng
Duck	Pét	Kai pét	Pák-mák	Ino, An	Hán
Ear	Hú	Ná	Ná	Lángle	Ká Skor
Earth	Nín	Ngá	Há	Ní háng	Ká Kandeu
East	W'an ok	Ján-prú	Sán-hóng	Cho	Mih ngí
Eat	Kín	Sháu	Chá-ó	Oti	Bám
Egg	Khai	Udi	Ati	Eriásek	Ká Palleng
Elbow	Sok	Latsáng dum	Dak-kú	Ingnár	Ká Tang bait
Elephant	Tsáng	Magui	Puok	AmeK	U or Ka Hátí
Eye	Tá	Mi	Mit	Imáháng	Ká Kamát
Face	Ná	Mán	Than	Kijáng, Kloh	Ur
Fall	Tók	Gadángu	Ijáó	Kájló	Jingái
Far	Kai	Tsán	Háiló	Pinot	Bá Sngáid
Fat	Pi	Phum	A tat	Apo	U Kapá
Father	Po	Wá	Vá	Phere	Shepting, Khaweit
Fear	Kó	Khritu	Chéo	Arweng	Ká Sner
Feather	Khun	Mun	Nap	Ranching	Iá shat, Iádát, Iá pam
Fight	Hit sük	Phen khátu	Rán man nó	Munso	Ká Shinriáti
Finger	Leü	Liung	Dak sú	Me	Ká ding
Fire	Phai	Wan	Van	Ok	Ká Dokkhá
Fish	Pá	Ngá	Ngá	Mir	Ká Sintin
Flower	Mok	Siban	Chóng-pó	Keng	Ká Kaját
Foot	Tin	Lagóng	Dá	Káng hám	Ká Klábáh
Forest	Thán	Mi ling	Ling		

Forget	Lúm	Malápu	Ilakó	Tetenge	Klet
Frog	Khyit	Su	Lúk	Sáráti, Boklá	Ká Jákoid
Fruit	Mak	Sí	Ari	Athe	Ká Soh
Get	Nai	Lu-u	Ichú-o	Lháng	Ioh
Girl	Kun ying án	Síwí	Dehick chá	Osope	Ká Kunná
Give	Hü	Yáu	Kó-o	Pi	Ái
Go	Kwá Pái	Wáu	Ká-ó	Dám	Leit
Goat	Pe	Bainam	Kien	Be, Bí	U or Ká Biáng
God	Phurá	Phrá	Kathak rang	Arn-nám	U Blei
Gold	Kham	Já	Kam	Ser	Ká Kser
Good	Ní	Gajá	Asan	Me	Bá bhá
Goose	Pet han	Kai khán	Hán	Wokak tetungár	(No term)
Grass	Yá	Tsing	Hing	Non	Ká Phláng
Great	Yáu, Lung	Gubá	Adóng	Akethe, Tetungár	Bá kráu
Hair	Phum	Kará	Kachó	Chu	U Shnin
Hand	Mü	Letá	Dak	Iri	Ká Kti
Hard	Khyeng	Já	Aché	Káng táng	Eh
Hate	Tsang	Matsátu	Chinyá-ó	Sim	Isi
Have	Mi, Yang	Ngá dai	Itóngá	Do	Ioh
He	Man	Khi	Até	Aláng	U
Head	Hú	Bóng	Khó	Phu	Ká Kli
Hear	Ngyn	Nángu	Táto	Aju	Sngou
Here	Thai	Ná-de	Anang	Lándák, Lelang	Háng neh
High	Sung	Tso-de	Achuong	Kártul	Bá jerang
Hill	Nói	Kanphú bum	Há chông	Ing long	U Lum
Hog	Mú	Wá	Vak	Phák	U Sniáng
Horn	Khau	Rung	Róng	Anuk	Ká Reng
Horse	Má	Gumráng	Mók	Nochel	U Kalái
Hot	Mai, Hon, Lüt	Káthet	Akhám	Kisob, Chodák	Shit
House	Hün	Ntá	Hum	Hem	Ká Ting
Husband	Phó	Lá	Delá	Ápinghán	U Tangá
I	Kau	Ngai	Ngá	Ne	Ngá
Immediately	Tsang, Ngai	Yá	Dókko	Serák rák	Kumneh Kumneh
In	Kan nài	Kátái	Nyu	Árl-lá	Há, Hápoh
Iron	Lék	Mpri	Ján	Inghin	U Nár

<i>English.</i>	<i>Khamti.</i>	<i>Singpho.</i>	<i>Namsangiyá Nága.</i>	<i>Mikir.</i>	<i>Kassia.</i>
Ivory	Ngá tsáng	Magui-kóng	Puok pá	Ingnár ángi	U Hátí ká banyiat
Kill	Khá, Au, tái	Sotu	Rik yato	Pank klák, Chakwó	Paniáp
Kiss	Tsup	Tupu	Tumo	Mung	Iádoh
Knife	Mit	Ning syi	Mit chá	Nokso, Lokék	Tárf
Knee	Hó khau	Laphút	Dáku	Keng kung	Kosin
Know	Hú	Chéngú	Ijeto	Thek	Típ
Laugh	Khó	Manú	Ngí-ó	Káng nek	Rakhí
Little	On, Lek	Katsi	Achá	Bá rit	Bá báshái
Light (n)	Leng	Ningthóí	Rangvó	Tháng	Ká Leili
Lightning	Mep, Fá-mep	Mu rap	Kiepdá	Cheneng birláng	Kámih
Look	Lem	Yúu	Syú-ó	Láng	Bá jérong
Long	Yáu	Gálú	Aló	A-kiding	Lamir
Mad	Sop, Má	Maná	Apá	Ing chám	U Man
Man	Kun	Singpho	Mi-nyán	Arleng, Pensó	Bun
Many	Nam	Ló	Ajá	Ako-ong	Ká Shíliá
Mat	Sat, Phok	Penep	Ham	Tár	Ká Dáwái
Medicine	Yá	Sí	Pham	Then kur	Ká Dud
Milk	Nam lum	Tsu	Ngüpo	Chiláng	U or Ká Shri
Monkey	Ling	Woé	Véh	Kipi	U Banái
Moon	Lün	Sítá	Dá	Choklo	Ká Kami
Mother	Me	Nú	Ing-yóng	Aió, Jong	Ká Shintur
Mouth	Sup	Ning-gup	Tun	Ang-gho	Ká Karteng
Name	Tsü	Ming	Min	Men	Najan
Near	Tikau	Ni	Therkó	Adung	Ká Randáng
Neck	Kho	Du	Bó	Ang phun	Ká Skum
Nest	Hang	Ning tong	Arúp	Ator, Chek	Bá tamái
New	Maü	Ning nám	An-yan	Akini	Ká Miet
Night	Khün	Siná	Rang-pan	Annue	Em
No	Ntsau	Galai	Má	Long, Ná	..
Noise	Sing	Gási	Nátbá	Arki	Shatei
North	Náhong	Paiján	..	Arkil ? Uttor	Ká Kamut
Nose	Láng	Nádi	Khó	Nokán	Montá
Now	Tsang	Yá	Dok-ko	Mon	Ká Umpeni áng
Oil	Nam man	Namán	Tán thí	Jáng thu	

Old	Kau, Thau	Ningsá, Dinglá	Ató, Téka	Akisár	Tammen, Rim
Open	Pút	Yánu	Jáno	Ungpu	Pauáng
Paddy	Khau pük	Mám	Chá	Sok	U Kabá
Place (v)	Waj	Dáu	Thiéno	Bí	Buh
Plant (v)	Puk	Khau	Kheto	Eh	Tung
Plough (n)	Thai	Thai	Nángol	Lángol	Ká, Lankor
Pull	Tút	Gángu	Syeta	Uwung	..
Push	Sai	Ganongu	Thuamo	Dol	Niát
Quarrel	Nan, Phit	Ning getu	Manó	Choprong	Iámái
Quickly	Hit kai	Gáláu	Khorók	Sárak	Kloi-kloi
Quietly	Ning	Tsam tsará	Rang pát	Páse	Járjár
Rain	Phun	Maráng	Tuono	Arwe	U Sláp
Raise	Yó	Pónu	Jápu	Rung	Kantin
Rat	Nú	Yú	Rí	Phuyu, Phiyu	Ká Knai
Ratan	Wai	Rí	Vóng	Pri	U Tri
Rice	Khaú sán	Ngú	Achám	(Cooked) An, (Un- cooked) Cháng	U Kán
Ripe	Súk	Min	Chápó	Men	Láian, Láih
Rise	Luk	Rotu	Jóan	Thur	Ieng
River	Khye nam	Khá	Lam	Lángpi	Ká Wáh
Road	Táng	Lám	Chuano	Toár	Ká Lanti
Run	Len	Gagátu	Súm	Kát	Phet
Salt	Kü	Júm	Sei	Ingti	Ká Mlah
Sand	Sái	Kumsái	Khéó	Sángtel	U Shiáp
See	Han	Mu-u	Lámo	Láng	Ioh ih
Seek	Khá	Tám-u	Sango	Láng tá	Wád
Sell	Kháí	Dútu	Atóon	Jor	Die
Short	Lot	Ku tún	Sako	Thimok, Thisnet	Bá tabian
Shut	Tan, Háp	Láu	Ngún	Ngháp	Khang
Silk	Nái	Náiri	Séséo	Pát	(No generic term)
Silver	Ngún	Kun phróng	Ing yáh	Rupá, Tángá	Ká Rupá
Sing	Mo	Ning tsinu	Tóngo	Lún	Rinai
Sister	Pying, Nongsáu	Nába		Bái (elder), (younger).	Ká Hanmen, Ká
Sit	Nang	Dángu		Ni	Pará
					Shong



English.	Khamti.	Singpho.	Namsangnyá Nágá.	Mikir.	Kassia.
Skin	Nang	Phi	Akhuon	Areng	Ká Snep
Sleep	N'on, Nap	Yúpu	Júpo	<i>r</i>	Ioh tiáh
Slowly	Loi loi	Chausu	Aré	Lábelá	Manníán
Small	On	Katsí	Aring	Kibi	Bá rit
Smoke	Khon phai	Wankhut	Vankhú	Dhung há	Ká Tedem
Snake	Ngú	La pú	Pú	Phurul	Ká Baseir ?
Son	Luk sáu	Lásyá	Chá	Ásope	U Kun
Soul	Khon, Sai tsau	Manlá	Dá phá	Ining	Ká Mansim
Sour	Sóm	Khrí	Ásí	Thor	Bá jen
South	Pái tsan	Ná hong	Thó-o	Dakhin ( <i>Asam.</i> )	Sháti
Speak	Wá	Sú-u	Chapo	Thán	Kren
Stand	Sau	Sapu	Mérík	Arjáp	Ieng
Star	Náu	Sigan		Choklo lángso ( <i>Lit- tle moons</i> ).	U Klur
Steal	Lák	Lugú-u	Hú-o	Hu hu	Tuh
Stone	Hin	Nlung	Lóng	Arlong	Man
Stop	Phá	Khringu	Bamó	Dotáh	( <i>No general term</i> )
Strong	Heng khü	Ning-gún-já	Achán	Apháran	Bá Klán
Sun	Wan	Ján	Sán	Arni	Ká Sngi
Sword	Náp	Napseng	Dangló	Nok	Ká Wait
Take	Áu	Láu	Kapo	En	Shim
Thunder	Nang, Phá nang	Musigá	Ráng mók	Sining kángreng	U Partát
Tiger	Sü	Siróng	Sá	Tike	U Klá
Tobacco	Yá	Yá mún	Vankhu	Dhumá	Ká Dumá
To-morrow	Maphók	Mphóni	Ninap	Mináp	Láshái
Tongue	Lin	Sing let	Tháli	Áde	Ká Tallid
Tooth	Khiu	Wá	Pá	Ácho	Ká Baniát
Tree	Tun	Phun	Bang	Árong	Ká Ding
Village	Mán	Mereng	Há	Rong	Ká Shnong
Uncle	Pulang, Mepá	Wádui	Dídí	..	( <i>Pat.</i> ) U Kapáná,
Want	Khaiü	Ráu	Ilamo	Láge	( <i>Mat.</i> ) U Kani
War	Sük	Phen	Rán	Ron	Kwá
Water	Nam	Ncin	Jó	Láng	Ká Um

West	Wan tók	Jánsáng	Sán yap	Ngpót	Sep ngí
White	Kháu, Phük	Phróng	Apó	Akolák	Bá lih
Wife	Mé	Númsyá	Tang-ngyú	Ápiso	Ká Tangá
Wind (n)	Lóm	Mbung	Póng	Tomon	Ká Lher
Woman	Phú ying, Kun ying	Númsyá	Déhek	Atlossó	Ká Kantei
Wood	Thün	Phun	Pan	Teng	Ká Diing
Work	Hit	Munglí	Mo-ot	Chál tiki	Trei, Kám
Year	Pí	Laning	Rangpá	Neng kan	Ká Snem
Yes	Tsäu	Raiá	Idángá	Oi	Há hoi
Young	Nun	Kunglúng	Atien	Riso, Ojáng	Lung, Kanrán

One	Nüing	Aimá	Vánthe	Ichi	Wei
Two	Song	Nkhong	Ványí	Hini	Ar
Three	Sám	Masúm	Vánram	Kathom	Lai
Four	Sí	Meli	Belí	Phili	Sáu
Five	Há	Mangá	Bangá	Phong	Sán
Six	Hók	Kru	Irók	Thorok	Hinriu
Seven	Tset	Sinit	Ing-it	Thor-k-chi	Hinian
Eight	Pet	Macat	I'sat	Ni-rkep	Práh
Nine	Kaü	Tsekhú	Ikhú	Chi-rkep	Kondái
Ten	Síp	Sí	Ichi	Kep	Shipón

*Aborigines of Southern India.*—By B. H. HODGSON, Esq.

*To the Secretaries Asiatic Society.*

GENTLEMEN,—In prosecution of the steps already taken by me and recorded in our Journal, for obtaining ready and effective means of comparing the affinities of all the various aboriginal races tenanting the whole continent of India, I have now the honour to submit a comparative vocabulary of seven of the Southern tongues. Five of them belong to the cultivated class of these tongues, viz. Tamil, Malayálam, Telúgú, Carnátaca, Túlava; and two to the uncultivated class, viz. Cúrgi and Tódava. The former are given both in the ancient and modern form, and care has been taken to procure the genuine vocables instead of those words of Sanscrit origin which are now so apt to be substituted for them, especially in intercourse with Europeans. I am indebted for these vocabularies to Mr. Walter Elliot of Madras, whose name is a sufficient warrant for their perfect accuracy.

In regard to these cultivated tongues of the south, among which we are led by history and reason to look for the prototype of *all* the aboriginal languages of the continent,\* Mr. Elliot observes that the aptitude of the people at present to substitute prákritic words for aboriginal ones is such a stumbling block in the search for affinities as it requires pains and knowledge to avoid; and he instances (among others) the common use of the borrowed word rakta for blood, in lieu of the native term néthar, by which latter alone we are enabled to trace the unquestionable ethnic relationship of the Góns, (even those north of the Vindhia) with the remote southerners speaking Telúgú, Cannádi and Túlava.

On the subject of the local limits and mutual influence at the present day of the cultivated languages of the south upon each other, Mr. Elliot has the following remarks:—"All the southern dialects become considerably intermixed as they approach each other's limits. Thus the three words for egg used indifferently by the people speaking Canarese, (matté, tetti, gaḍḍa) are evidently obtained, the first from the Tamulian,

\* Journal, No. 197, for November last. The Himálayan languages form an exception to this assumed general prevalence of the Tamulian type of speech. See Journal for December 1847, and December 1848.

matta ; the last, from the Telúgú, gadda. This intermixture, which is of ordinary occurrence in all cognate tongues, is here promoted specially by extensive colonization of different races, as of the Telúgús into Southern India under the Bijaynagar dynasty, where they still exist as distinct communities—and of the followers of Rámanúja Áchárij into Mysore, where they still are to be seen as a separate class speaking Támil in their families, and Carnátaca in public. The Reddies also, an enterprising race of agriculturists, have migrated from their original seats near Rajahmandry, over the whole of Southern India, and even into the Maháráshtra country, where they are considered the most thriving ryots, and are met with as far north as Poona.’’\*

Of the uncultivated tongues of Southern India Mr. Elliot has been able to procure me on the present occasion only incomplete vocabularies of two, viz. the Cúrgi and Tódava. But further assistance may be looked for from him in regard to this class of tongues, as to which he observes that “ the dialects of the Cúrambers and Irulers and other mountain races of the south are well worth exploring.” I have likewise myself made fresh application to Colonel Low, to our Residents at Baroda and Sattara, and to other parties residing at Gúmsar, the Nilgiris and Ceylon, with a view to completing the comparative vocabulary of all the continental and Insular aboriginal languages ; and to our authorities in Assam and in various parts of the chain of mountains dividing our provinces from those of Ava, in order to obtain the Indo-Chinese series of border languages—all upon one uniform plan.

These shall be hereafter forwarded as received, with such remarks as the study of the whole may suggest.

\* For the ordinary and proper locale of the several cultivated tongues of Southern India, see Ellis’ Dissertation and Wilson’s Makenzie Manuscripts. Mr. Elliot speaks in illustration of the general and well known facts of the case.



English.	Tamil		Malayálam.		Telugú.		Carnátaka.		Tuluva.	Cúrgi.	Todava.
	Ancient	Modern.	Ancient.	Modern.	Ancient.	Modern.	Ancient.	Modern.			
Air	Kál	Káttu	..	Kátta	..	Gáli	Elaru	Gháli	Gháli	..	Kott
Ant	Uravi	Erumbu	..	Irumba	..	Chima	..	Iriyi	Pijin	..	Erb
Arrow	Kanei	Ambu	..	Amba	..	Ammu	Saralu	Ambu	Biru	..	..
Bird	Pul	Paravei	Parva	Pakki	..	Pitta	..	Hakki	Pakki	Pakki	Pull
Blood	Sennir	Udiram	..	Chora	..	Netturu	Kenniru	Netturu	Nettar	Chore	..
Boat	Pakada	Odam	..	Vanji, or Vallam	..	Paḍava	Páru	Doni	Oḍa	..	..
Bone	Enpu	Elumbu	..	Ella	..	Emika	Elume	Eluvu	Elu	..	..
Buffaloe	Karán	Erumei	..	Eruma	..	Enumu	..	Emme	Erme	..	Ir
Cat	Púnei	Púnei	..	Púchecha	..	Pilli	..	Bekku	Pucheche	..	..
Cow	A ; Pettam	Pasu	..	Payya	..	Ávu	Ávu	Hasuvu, Ákalu	Petta	Payyu	Tamma
Crow	Karumpillei	Kakká	..	Kákka	..	Káki	..	Kági	Khákke	..	Kak
Day	El	Pagal	..	Pagal	..	Pagalu	Pagalu	Hagalu	Pagil	Pogal	Pokhal
Dog	..	Náyi	..	Náya	..	Kukka	..	Náyi	Náyi	Náyi	Náyi
Ear	Sevi	Kádu	..	Káda	..	Chevi	..	Kivi, Kimi	Kebi	Kemi	Kavi
Earth	..	Nilam	..	Nilam	..	Pudami	..	Poḍavi	Nela	..	Nelan
Egg	Sinei	Muttei	..	Múṭṭa	..	Guddu	..	Tatti, or Motte or Guḍḍu	Mutte, or Teṭṭi	..	Mukshu
Elephant	Kaliru	Áne	..	Ána	..	E'niga	..	Áne	Áne	Áne	Án
Eye	Náttam	Kan	..	Kanna	..	Kannu	..	Kannu	Kann	Kann	Konn
Father	Endei	Tandei, Tagappan, Appan	..	Achchan	..	Tandri	..	Appa, Tande	Amme	..	Eyyan
Fire	Azhah*	Neruppu	..	Tiyya	..	Nippu	..	Benki, Kechchu	Tu	..	..
Fish	Puzhal	Mín	..	Mín	Mínu	Chépaṭ	..	Mínu	Mín	..	..

\* *Zh* is employed, according to Mr. Ellis' plan to represent the Tamil like a hard *L* by Europeans, Muhammadans, and other foreigners—and also by the Pariahs. Thus *azhal* would be *alal*.  
 † So written but pronounced *Chapa*.

Flower	Alar	Pú	Puvva	..	Puvvu	Puvvu, or Pú	Huvvu	Pu	..	Puvvu
Foot	Kazhal	Adi	Adi	..	Adugu	Ađi	Heje	Haji	..	Orri*
Goat	Vellei	Adu	Vallađu	..	Méka	..	Kuri	E'du	Kuri	Adr
Hair	Kuzhal	Mayir	Talamuđi	..	Ventruka	..	Kudalu	Kudalu	Orama	Mir
Hand	Tol	Kai	Kayya	..	Cheyi	Tol	Kayi	Kai	..	Kayi
Head	Senni	Talei	Tala	..	Tala	..	Tale	Tare	Mande	Mudd
Hog	Kézhal	Panri	Panni	..	Pandi	Pandi	Handi	Panji	Pandi	..
Horn	Kodu	Kombu	Komba	..	Kommu	..	Kođu, or Kombu	Kombu	..	Kurr
Horse	Páymá	Kudirei	Kudira	..	Gurramu	..	Kudure	Kudare	Kudre	Kadar
House	Illam	Manci, Uídu	Vída, Illam	..	Illu	..	Kudure	Illu	..	Arra
Iron	Karumbon	Irumbu	Irumba	..	Inumu	..	Mane	Karba	..	..
Leaf	Adei	Elei	Ela	..	Áku	..	Kabbina	..	Elakand	Err
Light	Oli	Velichcham	Velichcham	..	Veluturu	..	Ele	Ire	..	Pelch
Man	Makana	Al, see night	Al	..	..	..	Belaku	Bhoksha	..	Al
Monkey	Kaduvan	Kurangu	Koranga	..	Koti	..	Alu	Al	Mánus†	Kodan†
				..	..	..	Kodaga, or Manga	Mange	..	..
Moon	Pirei	Tingal	Tingal§	..	..	..	Ac	Tingalu	..	..
Mother	Inrál	Táyi or Áyi	Amma	..	Talli	..	Táyi, or Áv. va	Appe	Avva	..
Mountain	Varei	Malei	Mala	..	Konda	Male	Gudđa	Gudde	..	Pann
Mouth	..	Váyi	Váya	..	Noru	..	Báyi	Bayi	..	Páyi
Moschito	..	Kosuvu	..	..	Doma	..	Solle	..	..	..
Name	..	Pér	Péra	..	Péru	Pesaru	Hesaru	Pudar	..	Pér
Night	Al	Írá	Ráv	..	Réyi	..	Iralu	Iral	..	..
Oil	Néyam	Ennei	Enna	..	Núne	..	Enne	Enne	..	Enn
Plantain	..	Vázhei	Vázha	..	Arađi	..	Bále	Bále	..	..
River	Varupunal	Áru	Puzha	..	Eru	Pole	Hódi	Tude	..	Pá
Road	Neri	Vazhi	Vazhi	..	Dari, Dova	Pade	Hádi	Sádi	Pole	Morg
Salt	..	Uppu	Uppa	..	Uppu	..	Uppu	Uppu	..	Upp
Skin	Adal	Tol	Tola	..	Tolu	..	Toralu	Tolu	..	Torra

† Sansc.

\* These words signify footstep rather than foot. The common word for foot in all the S. dialects is Kal.

§ The common word is *Chandra*, Sansc.

† Macacus radiatus.

English.	Támil.		Malayálam.		Telugú.		Carnátaka.		Túluva.	Cúrgi.	Todava.
	Ancient.	Modern.	Ancient.	Modern.	Ancient.	Modern.	Ancient.	Modern.			
Sky	Vin	Vánam	...	Mánam	...	Minnu	Mugilu, Bán, or Bán	...	...	...	Pone
Snake	Kadsevi	Pámbu	...	Pamba	...	Pámu	Pávu	Hávu	Parapunu	Pamb	Pab
Star	Vin-mín	Vánmín	...	Mínganna	...	Chukka	Mínú	Chukki	Daráya	...	Ponémín
Stone	Kan	Kal	...	Kalla	...	Ráyí	...	Kallu	Kalla	...	Kall
Sun	...	Pakalon	...	Súrya ( <i>com-mon</i> )	...	Poddu	Pallili	Hottu	Polutu	...	...
Tiger	Pul	Puli	...	Puli	...	Puli	Puli	Huli	Pili	Nari	Pirri
Tooth	Eyru	Pal	...	Palla	...	Pallu	Pallu	Hallu	Kúli	Pall	...
Tree	...	Sedi, Mar-am	...	Chedi, Mar-am	...	Chettu	...	Gida, Mara	Mara	Mara	Mén
Village	Pekkam	Úr	...	Tara, Désam	...	Úru	Palli	Halli, Uru	Úru	...	Modd, or Mort
Water	Punal	Tanni	...	Vellam	...	Níllu	...	Níru	Nír	Nír	...
Yam	...	Valli*	...	...	...	...	...	...	...	...	...
I	Yán	Nán	...	Gnán	...	Nénu	An	Nánu	E'n	Nán	One
Thou	...	Ní	...	Ní	...	Nívu	Nin	Ninu	I (pronoun- ced as in it)	Niu	Ní
He	...	Avan	...	Avan	...	Vádu	Avam	Avanu	Aye	...	...
She	...	Aval	...	Aval	...	Ame	Aval	Avalu	Aval	...	...
It	Akudu	Ada	...	Ada	...	Adi	...	Adu	Av	...	...
We	Yám	Nám	...	Gnángal, or Nám	...	Mému	Am	Návu	Enklu	Eng	...
Ye	Nívir	Nír	...	Níngal	...	Míru	Ním	Nívu	Inukulu	Ning	Namma
They	...	Avar	...	Avara	...	Váru	Avar	Avaru	Akulu	Avaru	Adám
Mine	...	Enadu	...	Enre	...	Nádi	...	Nannadu	Ennow	...	...
Thine	Ninadu	Unadu	...	Ninra	...	Nídi	...	Ninnadu	Innow	...	...
His	...	Avanadu	...	Avanre	...	Váđidi	...	Avana	Ayanow	...	...

\* Dioscorea alata, perin valli, Malayálam. D. oppositifolia, avating tuga, Telugú. D. aculeata, seru valli, Tamil; ganusu, Carnátaka. D. pentaphylla, nuran kighang, Tamil and Malayálam.

Our's	Enadu	Namadu	....	....	....	....	....	Enkulano	....	....
Your's	Numadu	Umadu	....	....	....	....	....	Inkulano	....	....
Their's	....	Avarudu	....	....	....	....	....	Akulano	....	....
One	....	Onru	....	....	....	....	....	Onji	....	....
Two	....	Irandu	....	....	....	....	....	Eradu	....	....
Three	....	Munru	....	....	....	....	....	Muji	....	....
Four	Nangu	Nalu	....	....	....	....	....	Nalu	....	....
Five	Aindu	Anju	....	....	....	....	....	Ayinu	....	....
Six	....	Aru	....	....	....	....	....	Aji	....	....
Seven	E'zh	E'zhu	....	....	....	....	....	E'l	....	....
Eight	....	Ettu	....	....	....	....	....	Ename	....	....
Nine	Onbaku-	Onbadu	....	....	....	....	....	Ombatto	....	....
Ten	Orupaku-	Patta	....	....	....	....	....	Pattu	....	....
Twenty	Irupaku-	Irupadu	....	....	....	....	....	Irvo	....	....
Thirty	Mupaku-	Muppadu	....	....	....	....	....	Muppo	....	....
Forty	Narpaku-	Narpadu	....	....	....	....	....	Narpo	....	....
Fifty	Aimbaku-	Aimbadu	....	....	....	....	....	Ayiva	....	....
A hundred	....	Nuru	....	....	....	....	....	Nadu	....	....
Of	....	Udaya	....	....	....	....	....	No, or Du	....	....
To	....	Kku	....	....	....	....	....	Ku, or Ge	....	....
From	Il	Ninru	....	....	....	....	....	Inda, or De-	....	....
By	An	Al	....	....	....	....	....	sainda	....	....
With	....	Odu	....	....	....	....	....	Inda	....	....
Without	Anri	Allamal	....	....	....	....	....	Kuda, or Ottugu	Kude	....
			....	....	....	....	....	Sargada	....	....
			....	....	....	....	....	Hortu	....	....
			....	....	....	....	....	Horata	....	....



English.	Támil.		Malayálam.		Telugu		Carnátaka.		Túluva.	Cúrgi.	Todava.
	Ancient.	Modern.	Ancient.	Modern.	Ancient.	Modern.	Ancient.	Modern.			
In	Kan	Il	...	Il	...	Lo	Ol	Olage	Olai idu	...	Ol
On	....	Mél	...	Mél, Méle	...	Payini	...	Méle	Mittu	....	....
Now	Ippozha- du	Ippodu	...	Ippol	...	Ippudu	...	Iga	Itten	Ikkalu	Itwan
Then	Appozha- du	Appodu	...	Appol	...	Appudu	...	Ága	Ápal	Anda	Atwan
When ?	Eppozha- du	Eppodu	...	Eppol	...	Eppudu	...	Yávaga	E'pag	Ekke	....
To-day	Ittai	Inru	...	Inna	...	Nédu	...	Thottu	Ini	....	Idd
To-morrow	Pinrei	Nálei	...	Nále	...	Répu	...	Nále	Eli	Nále	Mockol
Yesterday	Nerunal	Nétu	...	Innale	...	Ninna	...	Nenna	Kode	Nenne	Enné
Here	Ivan	Ingu	...	Ivide	...	Ikkada	...	Ill	Inchi	....	Itt
There	Avan	Angu	...	Avide	...	Ekkada	...	Alli	Anchi	....	....
Where	Evan	Engu	...	Evide	...	Ekkada	...	Eli	Odeke	....	Ett
Above	Misei	Mél	...	Méle	...	Payina	...	Méle	Mett	....	....
Below	Kizhak- ku	Kízh	...	Tázhe	...	Kinda	...	Kelage	Sett	....	....
Between	Náppan	Naðu	...	Nadukke	...	Nadama	...	Maðuve	Naðu	....	....
Without, outside	....	Veliyl	...	Purame, or Puratte	...	Bayi'a	...	Horage	Pedi	....	Parmutak
Within	....	Ullil	...	Agatta	...	Lopala	...	Olage	Oli	....	Ullu
Far	Sémei	Tulei	...	Agale	...	Davvu	...	....	....	....	....
Near	Annei	Kitta	...	Añukke	...	Dápu	...	Hattara, or Sáre	Khayi, or Tol	....	Kéguri
Little	....	Siriya	...	Kora	...	Kásta	...	Tusa, or Thode	Onda	Chennang	....
Much	Mikka	Mikunda	...	Valara, or E'ra	...	Nindá, or Mikkili	...	Bahala	Dinj-a	....	Uppom
How much ?	Ettunei	Evalavu	...	Etra	...	Enta	...	Eshtu	Ett	....	....
As	Kaḍuppa	Pol	...	Pole	...	Vale	Pol	Háge	Anchane	....	....
So	....	Appaḍi	...	Angine	...	Atla	...	Háge	Do	Annane	....

Thus How Why	Ippaḍi Eppaḍi Ennei	...	Engine Engine Endina	...	Itlá Etlá E'la	...	Híge Háuge Yatakke, or Yáke	Inchene Jayekk	Innane ...	Iggas ...
Yes	Ám	...	Ade, Uvva	...	Avunu	...	Havudu	And	Akku	...
No	Illei	...	Illa	...	Ilédu	...	Illa	Iddi	Alla	...
(Do) not	Vénda	...	Vénda	...	Vaddu	...	Béda	Botri	...	...
And, also	Um	...	Um, Num	...	Nni, Nnu	...	U' (added to the end of the words coupled together)	No	...	...
Or	Alladu	...	Engil, Adalla, Allangal	...	Léka	...	Adaru	Anḍala	...	...
This	Avanuḍaya	...	Avande	...	Váni	...	Avana	Áyino	...	...
That	Adu	...	Ada	...	Adi	...	Adu, Á	Avu	Adu	Ad
Which ?	Yádu	...	Eda	...	Eḍi	...	Yávalu	Erno	...	...
What	Enna	...	Enda	...	E'mi	...	E'nu	Jána	...	Inn
Who ?	Ár	...	Ára	...	Evaru	...	Yáru	Uvanda	...	...
Any thing	Yáálakilum	...	Yádonnen-gil [rum]	...	Eḍainá	...	Yávalu	E'ránda	...	...
Any body	Áráyinum	...	Yádarutogil	...	Evaraina	...	Yárádaru	...	...	...
Eat	Tin	...	Tinnuga, or Unnuga	...	Tinu	...	Tinnu	Tinupuna	Unn	...
Drink	Kuḍi	...	Kudikka	...	Tágu	...	Kuḍi	Parapuna	...	...
Sleep	Túngu	...	Orakkam	...	Tongundu	...	Nidde hogu	Nidri-Iḍupuna	...	...
Wake	Vizhittukol	...	Onartuga	...	Melukonu	...	Echchattiru	Echchirigidupuna	...	...
Laugh	Nakai	...	Chirior Chirikkuka	...	Navvu	...	Nagu	Telepuna	...	...
Weep	Azhu	...	Karaga	...	E'dchu	...	Alu	Alupuna	...	...
Be silent	Summáviru	...	Minḍáthiru, or Uriyáḍáthiru	...	Uriké-Undu	...	Summageiru	Manipantipuna	...	...

English.	Támil.		Malayálam.		Telugú.		Carnátaka.		Túluva.	Cúrgi.	Todava.
	Ancient.	Modern.	Ancient.	Modern.	Ancient.	Modern.	Ancient.	Modern.			
Speak	....	Pésu	....	Paraya, or Samsárik- ka	....	Mátládu	....	Mátádu	Pater puna	Takpare	....
Come	....	Vá	....	Varuga	....	Vachchu	....	Baru	Barapuna	....	....
Go	....	Po	....	Poga	....	Povu	....	Hogu	Popuna	....	....
Stand up	....	Nil	....	Nilka	....	Niluchunđu	....	Nintu Kollu	Entuna	....	....
Sit down	Udká	Udkáru	....	Kuttuirika	....	Kúrchunđu	....	Kútu Kollu	Kullona	....	....
Move, walk	....	Naða	....	Nadakka, or Elakka	....	Naðuchu	....	Naði	....	....	....
Run	....	Oðu	....	Oðuga	....	Parigettu	....	Oðu	Párua	....	....
Give	....	Koðu	....	Kodukka, or Taruga	....	Ichchu	....	Koðu	Koðupuna	Tá	....
Take	Ettukkol	Eðuttukkol	....	Eðukka	....	Puchukoku- nu	....	Tokkolu	....	....	....
Strike	....	Aði	....	Aði, Talla	....	Kottu	....	Hode	....	....	....
Kill	....	Kol	....	Kolla	....	Champu	....	Kollu	....	Kol	....
Bring	Koná	Konðuá	....	Konduva	....	Techchu	....	Taru	....	....	....
Take away	Koðupo	Konðupo	....	Konðupo	....	Tísukonipo	....	Oyyu	Konðattu popuna	....	....
Lift up, raise	Mérkol	Eðu	....	Pondikka	....	Ettu	....	Ettu	Diripana	....	....
Here	....	Kél	....	Kélikka	....	Vinu	....	Kélu	....	....	....
Understand	....	Aři	....	Tirichchiri- ka	....	Teliyu	....	Tili	Teriyunnu- puna	....	....
Tell, relate	....	Sol	....	Para	....	Cheppu	....	Hélu	Panuppuna	....	....
Good	....	Nalla	....	Nauna, or Nallada	....	Manchi	....	Olle, or Chelava	Eddattano	Nallad	....
Bad	....	Ketta	....	Chitta	....	Cheḍḍa	....	Ketta	Pedikattano	Kuttaḍ	....
Cold	Tanniya	Kulirnda	....	Tanutta	....	Challoni	....	Tampu	Ch'hali	Kultat	Pillele
Hot	Veyya	Sutta	....	Chúda	....	Véḍi	....	Bisi	Sekhe	Bekkel	....

Raw	Pozháda	Pachchei	Pachcha	....	Hasi	Paje	Pache	....
Ripe	Kaninda	Pazhutta	Pazhutta	....	Mágida	Paranda	....	....
Sweet	Iniya	Tittitta	....	....	Sí	Tipe	Mantat	....
Sour	....	Pulitta	Puli	....	Huli	Puli	....	Pilba
Bitter	Kasanda	....	Kayippa	....	Khayyi	Khayipe	Kaipal	Kachehatt
Handsome	Azhakiya	....	Koutuka- máya	....	Cheluva	Eddattano	....	Narradodi
Ugly	Payirpá- Ozhungá- na	....	Vashala Néhe, Chov- ve	....	Andagédi Sariyáda	Padikettano Sarta	Nére	Odeda
Straight	Kodiya	....	Valanga	....	Sotta	Mont	....	....
Crooked	Kariya	....	Karutta	....	Kari	Khappa	Kartad	Kapp
Black	Velliya	....	Velutta	....	Bile	Bollane	Baltad	Pelpam
White	Seyya	....	Choganna	....	Kempu	Kempu	Chondad	....
Red	Pachchei	....	Pochcha	....	Ele hasuru	Pache	....	....
Green	Nínda	....	Nínda	....	Udda	Udda	....	....
Long	Niliya	....	Kuranna	....	Gidda	Kuddya	....	[ragatti
Short	Kuriya	....	....	....	Udda	....	....	Niraka, Ne-
Tall	Uyarnda	....	....	....	Gidda [kka	....	....	Kullol
Short	Kuriya	....	....	....	Gidda	....	....	....
Small	Vapídána	....	Chiriya	....	Sanna, Chi-	Kennu	....	....
Great	Periya	....	Valiya	....	Doqda	Mallow	....	....
Round	Servána	....	Urunda	....	Gundu	Uruttu	....	....
Square	....	....	Chadaram	....	Chouka	Chouka	....	....
Flat	Adara	....	Paranna	....	Chappate	....	....	....
Fat	Valatta	....	Kozhutta	....	Kabbida	Thora	....	Pekkam
Thin	Melliya	....	Melinna	....	Tellaneya	Sabara	....	....
Weariness	Ayarppu	....	Valachal	....	Danivu	....	....	....
Thirst	....	....	Tanni Keri- chal	....	Niradike	Bajil	....	Nikhosti
Hunger	Posi	....	Visappa	....	Hasivu	Paduvu	....	....

P. S. In representing the vernacular terms in Roman characters I have followed the received mode of spelling; d, t, with dots under them represent the hard cerebral sounds of these letters which have only one representative with us, as opposed to their soft dental sounds; r among the Todas has a peculiarly harsh and prolonged sound which I have represented by reduplication. The correct sound of the Tamil zh is a deep cerebral enunciation of the French j formed by touching the back of the palate with the tongue. Such a sound is very common in Tibetan and its derivatives, wherein nearly every d and g and ch becomes a harsh zh, as Digarchi pronounced Zbigatzhi.



*A Journal of a trip through the Kohistan of the Jullundhur, undertaken at the close of the year 1847, and commencement of 1848, under the orders of the Supreme Government of India, for the purpose of determining the Geological formation of that District. By W. H. PARISH, 2nd Lieut. Bengal Artillery. Communicated by H. M. ELLIOT, Esq. Secretary to the Government of India.*

The plain of the Jullundhur Doab is but scantily wooded. It possesses a high sandy soil which can be rendered very productive by means of extensive irrigation. Its fruits and vegetables are of a superior description, and might be brought to the highest state of perfection by improved culture. The heat of summer is generally moderate, whilst the sharp frosts of its winters are very invigorating to European constitutions. Moreover, the climate all the year round is particularly healthy. The plain of the Doab is somewhat triangular in shape, it being included between the Sutlej and Beas rivers, and the Hoshiarpur range. Beyond this range lies a country surpassed by none for the fertility of its soil or the beauty of its landscape, and remarkable as a hill country for the facilities of access and intercommunication which it possesses.

2. Four miles to the northward of the large and populous town of Hoshiarpur is situated the Naree Pass which leads over the Pamrai or Hoshiarpur range into the Jaswun Dhoon. After entering the ghat the road lies along the bottom of a winding ravine for about five miles and then gradually ascends until it reaches the crest of the range, where, crossing over some table-land, it finally descends and enters the valley at Amb-mota. Just within the entrance of the pass is a well of excellent water, and a never-failing spring is met with about four miles further inward, at a place called Narce. To this spot the first march from Hoshiarpur is usually made. The village consists of half dozen bunya's shops, alongside of which is an ample space for a small encampment. It being situated at the bottom of the ravine the heat of the place is very great. The road is sandy and easy for horses. Camels can also travel over this ghat. The general aspect of this outer range of hills is barren and naked, for, with the exception of some scanty jungle in the damper glens, and here and there a sprinkling of stunted cheel (*Pinus longifolia*) hardly any vegetation is to be seen for

the greater part of the year. The little village of Amb-mota is, however completely hidden from sight by trees.

3. From this point to Amb-bagh across the valley, is about six miles. The large village of Ambee is placed on the edge of the Jaswun range, overlooking the valley, and the garden, after which it has been named. This last is a pleasant spot to encamp in; the cypress, the mangoe, the mulberry and other fruit trees forming an agreeable and shady retreat for the traveller. The fruits produced in this garden are of a fine description. It is kept constantly watered by means of a "kool" which conducts the water from an immense distance within the Jaswun range. This kool enables the villagers to cultivate many acres of land which otherwise must have remained unproductive. The great drawback to any extensive cultivation in this valley is the scarcity of water, and the sandy nature of the soil. The Sooran is almost dry during the hot weather, and the little water there is usually in it cannot be used for irrigation, as it already flows along the lowest level. It is a great pity that so noble a valley should be under such a disadvantage. The same objection obtains against the table-lands on the surrounding hills. These lands can now produce but one crop a year, whereas they could easily yield three under more favorable circumstances. The only crops I had as yet seen in these hills were the cotton, sugar-cane, motee (*trigonella* ?) bajra, (*Panicum specatum* of Rox.) and a vegetable like a very large radish, called I believe moolee, (*Raphanus sativus* ?). The grain crops had been sown and were just springing above ground. I left Hooshyarpoor on the 26th October, 1847.

4. Cheenee ghat is about 14 miles east south-eastward of Hooshyarpoor. The intermediate country is prettily wooded with mangoe topes, and intersected by numerous deep gullies which drain off the water from the hills. The entrance to the pass is any thing but tempting; not a tree nor a shrub is to be seen until the traveller nearly reaches the crest. As at the other ghat the road first runs along the bottom of a ravine and then ascends, and passing over the summit descends as rapidly again into the valley at Isapore. The ravine is much narrower and more tortuous, the ascent and descent are also more abrupt, and consequently more difficult than those in the Naree ghat. This one moreover, lies out of the direct route to the interior, which circumstance, combined with the other objections, have prevented any extended traffic

being carried on by this thoroughfare. The village of Isapore is situated in a wooded dell formed by two spurs projecting into the Jaswun Dhoon. From this spot may be seen to the eastward and across the valley, the high ridge of Kotlehr, with the detached forts on its summit; from Isapore to Amb-bagh is about 15 miles, which allowing 7 for the pass, makes the total distance from Hoshyarpoor to the last named village at least 35 miles, whereas by the former route it cannot be more than 22 miles; although my distances are mere guesses, they will not be found very far out, as I have had a good deal of practice to assist me in judging of distances from place to place. My constant habit of noting down the supposed number of miles and the time occupied in going over them has enabled me to calculate with tolerable accuracy the lengths of marches. From the road to Amb-bagh but few villages are visible, from their being generally built on the slopes of the hills on either side of the valley. Within a mile of the garden is a small jungle of dawk (*Butea poudosa*), which being in full blossom when I passed through it in April last added much to the beauty of the scenery by its crimson flowers.

5. The third march is to Kulao-ke-hutta, distant about 12 miles. There is but little difference between the Rajpoor ghat and the others. It is however more elevated and the slopes of the ravine are better wooded and consequently more picturesque than either of the former. The ravine leading up to the summit of the ghat is also much wider, but for two or three miles is covered with boulders, which makes it a painful journey for beasts of burden. The descent is sudden and steep, and the road is shockingly stony. About half way stands a handsome gateway on the edge of the khud, and looking down into it. This is the remains of the old fort of Rajpoor, which once commanded that pass. Behind the gateway is a considerable village, apparently in a flourishing condition. Kulao-ke-hutta, consisting of a few bunneas' shops, is situated within the angle formed by the junction of two torrent beds descending to the Beas. All around is a dense jungle, which I am told, is full of game. On the several occasions that I have had to encamp there the surrounding woods appeared to be alive with jungle fowls which kept up an incessant crowing.

6. The next march is to Joala Mukhi. At first the road passes over the spur on the left hand (or the northern one) descending afterwards into

the stony bed of a nullah, when it ascends the second spur, along which it continues until it reaches the river. From the right bank the direct road across the Joala valley is over an undulating country, and in parts bad for horses, but the road to the right or more southern one is as flat and as good as the queen's highway in England. The distance from the ferry to Joala Mukhi is good six miles. The march is a pleasant one, the scenery being agreeably diversified by woods and stream, hills and valley, with here and there picturesque hamlets and villages embosomed in trees. One mile from the river, on its left bank, is a considerable village (with a large tank in the centre) the name of which I did not note down at the time, and have since forgotten it. The lofty peepul trees growing in and about that village are usually covered with a large species of bat (*Galeopithecus volans*?) or flying fox, as they are often called. I tried on several occasions to obtain one but never succeeded. A boat and ferrymen are kept at the ghat to convey over the river men and baggage. The boats used on the Beas are similar to those used on the Sutlej. A Sutlej boat is an oblong platform having three of its sides raised two feet high, and the fourth, or stern projected up into a peak some six feet or more above the water. I cannot compare these singularly constructed sterns to anything else but the sharp points of native shoes, to which the curved ends are about as useful and ornamental as the elevated sterns are to the boats. The Beas at the ferry is very deep and from 50 to 60 yards wide, but its waters scarcely cover a fourth part of the bed they occupy during the rains, for then it cannot be less than a quarter of a mile wide. On my way to the ghat in October, I passed through some fields of "Sunn" (*Cutalaria jimcea*) which the villagers were then cutting. The cotton was also being gathered.

7. From Kulao-ke-hutta there is a road or rather beaten track to Nadoun, which follows the course of the river. Our unfortunate countryman, Mr. Moorcroft, travelled by this route when proceeding to Shujanpoor Jira. This one diverges from the former road about a mile from Kulao-ke-hutta, and continues along the crest of the first spur until its termination at the Beas, where it descends into the valley at Kolehsan ghat. Thence it proceeds along the left bank of the river to Nadoun. There are no boats kept at that ghat. The Beas, throughout its course in the Joala valley, presents broad sheets of water broken



here and there by falls. The spurs of the Jaswun range are in general well covered with low bush jungle, in the midst of which are many hamlets. The distance is about 10 miles, but the better way of getting to the last named place is by crossing the river at Chumba ghat and then proceeding directly to Nadoun. The highest point of the Hooshyarpoor range does not exceed 2,200 feet, and that of the Jaswun range 2700 feet above the sea. The elevation of the Joala ridge may be as great as 3,000 feet.

8. That portion of the Joala valley immediately adjoining the holy city is known by the local name of "Belear Dhoon." It is fertile and well cultivated. The town of Joala-mukhi is large and straggling, and is built at the base of the western slope of the Joala-mukhi or Chungar-ke-dhar. The town, with the wooded slopes of the Chungar forming the back ground, and the valley spread out before it, has a very picturesque appearance from a distance. There is nothing interesting, however about the town, it being filthily dirty and badly built. Even the celebrated temple itself is not free from its share of all manner of filth. It possesses no architectural beauty nor any thing worthy of notice, excepting the natural jets of gas. As in all other holy cities, so it is in Joala-jee, prayers and monkeys, sacrifices and debaucheries, priests and bulls go hand in hand. Judging from their conduct at their holy cities one cannot say much in favor of the "mild Hindu!" However, in all parts of the world there is not a view of human nature which is not sufficient to blight the seeds of pride! Through the town and up the range is an excellent flight of steps about two miles in length and leading up to a ghat at the summit. To the left, on a peak somewhat higher, is a neat little fort built of sandstone. This was erected by the Sikhs with an eye to plundering the temple below whenever an opportunity occurred, and it was supposed the priests had amassed a considerable amount of wealth. An extensive view of the Joala and Kangra valleys and of the Chumba range is obtained from this elevated spot. This range furnishes excellent sandstone for building purposes. Nearly the whole town is built of this material. There is a cool burra-duree outside the town open for the reception of travellers. In the "Report" on the Kohistan of the Jullundhur;\* I hinted at the probability of iodine being found in the saline springs below the temple; I have since learnt that it is not an uncommon ingredient in such springs.

\* Vide Journal of the Asiatic Society of Bengal, April 1848, page 285.

The numerous lime springs, as well as masses of rock salt which are contained in the red marl seems to offer additional proofs of the marine origin of these deposits, since Dr. Daubeny has shewn that in many of these saline sources there is an admixture of iodine, a principle which is confined to the sea, and its productions. This argument is not however to be considered decisive, but only as forming a portion of cumulative evidence, which taken in conjunction with that of the remains occurring in the deposits of this age on the continent, fortifies the conclusion that the salifereous marls are of marine origin, for it might be said that iodine and chloride of sodium have been derived in the first instance from the interior of the earth, and that the ocean may have owed its saltiness to beds of rock salt, as well as that rock salt owed its origin to the evaporation of sea water.”\*

9. The next march to Ranee-ke-talao, is about 14 miles in length, and the country is very pretty. The road passes through several villages, where many a rustic lane, shaded by trees, and enclosed by hedge rows, fragrant with the wild rose, the honeysuckle and violets, greets the English traveller and makes him sigh for the land in which every village has its own “love lane!” The road proceeds north-westward along the base of the Joala range until the latter has so much decreased in height as hardly to be distinguishable from the lower hills, when it turns suddenly to the north-east and passing over a low gap enters a small dell in which the tents are generally pitched. The village stands on the flattened crest of a short spur from the Joala range, and is about 300 feet above the encamping ground, which is situated in a quiet sequestered nook.

10. Passing through the village of Ranee-ke-talao the road descends to the bed of the stream which flows under the walls of Kangra and re-ascends on to some table-land. Four miles more of tolerably level road brings you to the thriving village of Dowlutpoor, thence, however, the road rises considerably and afterwards descends as rapidly to the level of the stream, crossed shortly after leaving the last encampment. The bed of this stream is some 200 feet below the town of Kangra. A steep flight of steps leads to the fort gateway on the one hand and into the town on the other. The length of this march is about 10 miles. A road direct from Chumba ghat to Ranee-ke-talao, is a desideratum, as it would shorten the distance by five miles.

\* Vide Muzchison’s Silurian system.

11. The fort of Kangra is built on a piece of land between two mountain streams\* which unite shortly after flowing past it. It consists of bastion upon bastion and wall within wall, and has been built after no particular plan or model, but at various times. The outer wall is two miles or more in circumference. The summit of the citadel must be fully 500 feet above the level of the stream which flows underneath. It is sadly out of repair and must soon fall to pieces. The ancient portions of this stronghold are built with sandstone, compact and fine grained, but the modern additions have been made with burnt bricks. With a stout-hearted garrison inside it would be almost impossible to take the place by storm, but as the whole of the interior is commanded by the surrounding heights, the garrison could be shelled out. By order of Lord Hardinge a single *eighteen pounder* has been left there, to which the silly mountaineers make propitiatory offerings. The fort is garrisoned by the 2d or Hill regiment of Sikh Local Infantry, under the command of three European Officers and a noncommissioned officer ; there is also an European Apothecary attached. The Regiment is 800 strong, divided into 10 Companies of 80 men each. The officers are selected from the Regiments of the line, and consist of a commandant, a 2d in command, an Adjutant and Quarter-Master, and a Serjeant Major. Within the fort are the remains of Hindu temples which are covered with elegant sculptures. One of them is much celebrated and is annually visited by hundreds of pilgrims. Both the town and the fort of Kangra are built upon an indurated calcareous conglomerate. The former contains between five and six thousand inhabitants. A short mile from this town is the still more populous one of Bhawun, built on the north-western slope of a hill called Múlkérá. Between the latter and the base of the Chumba range, distant about six miles in a direct line, lies the picturesque and fertile Pergunnah of Kangra ; most of the houses in the towns have roofs slated with slabs of micaceous clay-slate. The streets are narrow, and generally dirty, and are seldom anything better than flights of steps paved with boulders which have become so polished by constant friction as greatly to increase the difficulties of walking, but this very circumstance makes them the more agreeable to persons without shoes. In the centre of Bhawun is a neat Hindu temple with a gilded dome, which enhances the pleasant appearance of the town from a distance. The two modern

\* The principal one is called the Ban Gunga, which flows on the south-east.

houses lately built on the summit of Múlkérá hill have any thing but improved the look of the place. The entire management of this vast district of Kangra, extending from the Ravee, where it enters the plains to Spiti, is under the control of two Civilians, a Deputy and an Assistant Commissioner !

12. The view from the top of the gateway on Múlkérá hill is very fine. Immediately below lies a level valley divided by deep torrent beds, and subdivided into fields, each set of the latter having its own hamlet in the centre, embosomed in trees. Rising out of the valley, and to the north appears the fort of Rilloo, peeping out of a dense forest of pines (*P. longifolia*). To the south-east a low wooded range with a fort\* on its highest peak shuts out the elevated plain of Pullum. Straight before you, rising aloft, are the rugged peaks of Chumba, topped with snow. Lower down the range a dark belt marks the limits of a long extended forest,† below which again are extensive woods of oaks and rhododendrons, and lowest of all sloping into the valley, lies the noble plain of Dhurmsala, with here and there a village shaded by the graceful bamboo or umbrageous mangoe tree. Again, on turning one's back to this charming scenery another equally as novel is spread out before you. The fort and town of Kangra, the village of Doulutpore, and little Hindu temples perched on conspicuous peaks first attract your notice ; beyond these are seen the Joala range, with the faint outline of the Jaswun stretching out in the dim distance, and lastly to the westward is a complete chaos of low hills intersected by countless ravines.

13. To the south-eastward of Bhawun is a very singular natural archway of conglomerate ; its span, 3 feet above the ground, is 23 feet, height 15 feet, and the solid mass above the arch, the crown, is from 3 to 4 feet high, and from 2 to 3 feet thick, but this portion I was unable to reach for the purpose of exact measurement. This interesting object was discovered whilst strolling about one day in January 1847. Passing through the town of Bhawun I went through a few fields and came upon a plot of uncultivated ground strewed over with rubbish and the traditionary sight of one of Aurungzebe's palaces.

\* Pullum Puthan.

† The *Pinus Webbiana*, Horse Chesnut and Walnut trees are found in this forest, but no *Deodons*.



There numerous springs issue from the ground, and flowing down various fissures finally reach one of the streams which encircle the fort of Kangra. The bráhmans, who always select spots for their temples in some way or another favored by nature, in order I suppose to increase the sanctity of their idolatrous religion, have chosen one of the springs and endowed its waters with certain efficacious principles. This little brook, after working its way through several tanks, at last falls into a deep hole, which it has worn away for itself, escaping at last under the archway after a fall of about 25 feet. Entering from below, that place has the appearance of a large cavern with a considerable body of water falling from above. The constant force of the water has washed away the entire roof, leaving the arch standing out by itself some three feet beyond the rest of the conglomerate as a curious monument of the power of water when unremittingly exerted for several ages. On the top of it is built a paltry little temple with a bridge and staircase leading up to it. There are numerous other temples scattered about, and one is perched on the top of a precipice close by. Between this spot and the other is another deep fissure likewise worn away by a limpid stream. Near to where the water descends is a dripping spring, which oozing through the conglomerate, forms stalactites and encrusts every thing within its reach. There is also a similar spring three miles on the opposite side of Bhawun. Immediately under the former one is a large block of quartz crumbling away under its destructive influence, but whilst the solid rock is yielding to the corrosive power of that spring, a delicate little fern drinking deep of its waters flourishes and grows luxuriantly. I believe the latter to be a species of *adiantum*. I have sent specimens of it with the rest of the plants forwarded to Calcutta in April last.

14. There are many pleasant rides and walks about Kangra. Dhurm-sala is a pleasant resort. That plain is about nine miles distant, and the intermediate country is prettily wooded with clusters of bamboo, topes of mangoe, peepul and other trees, with here and there a stately palm. Leaving the lower valley, the road ascends into the plain at its south-western extremity. It is an extensive grassy plateau sloping up rapidly towards the snowy range. The sunken bed of a torrent separates it on one side from the adjacent lowland, and a low ridge covered with small Cheels\* bounds it on the other. Its extreme length

\* Cheels, *Pinus longifolia*.

is about  $1\frac{1}{2}$  mile, with a breadth varying from 150 yards to 600 yards. The highest end has been calculated to be about 4700 feet above the sea. The soil is alluvial, having a covering of six inches of vegetable mould. It was pronounced favorable for the cultivation of the tea plant by Dr. Jameson, and has been selected by him for that purpose. Although the fall in its slope is great, it nevertheless can be irrigated with the greatest facility by means of two Kulus\* of water which have been conducted from the snows by the Puharees.† The greater part is at present uncultivated. At the head or highest part are a few blacksmiths' huts. They obtain the iron which they use from the ferruginous sandstone found in the neighbourhood. Further up is another cluster of huts with an orchard or two, and in one of them, amongst other fruit trees, such as the Apricot and Cherry, &c. I met with two or three plantains apparently thriving, although exposed to the cold nights of January at an elevation of 5,400 feet. That plantains can survive the effects of frosts and snow I have lately had indisputable proofs. On the 2nd February 1847, snow descended and continued falling for one hour and twenty minutes, which ultimately covered the valley and the surrounding hills to the depth of an inch. My Fahrenheit's Thermometer fell to two degrees below the freezing point during the night, and did not commence re-ascending until one hour after sunrise on the following morning. Several times both before and after this trying night we experienced very severe frosts. Now in and about the valley, are the mangoe, bamboo, a species of palm, peepul, banian and the plantain, every one of which survived the severity of the weather. Moreover adjoining the plain of Dhurmsala and near the road leading to it is a slightly elevated ridge, along the crest of which may be seen several old peepul trees and clumps of bamboos. On that ridge snow usually falls about once a year to the depth of four inches or more, so that those ancient trees must have withstood the rigors of many a stormy winter. Again, on the 2nd of February of this year (1848) a heavier fall occurred, and the snow remained on the ground much longer than in the preceding one. I happened to be at that time at Shajanpoor Tira, where near the summit of an exposed hill is a garden‡ adjoining the palace of the great Samsar Chund, and contain-

\* "Kool," a Conduit.

† Puharees, Mountaineers.

‡ An approximation, which may be 100 feet more or less than the truth, gives it an elevation of 3000 feet.

ing a large number of plantains. At sunrise the next morning, after the fall I went to examine how they had fared, I found their fronds covered with frozen snow and drooping under its weight, but in the afternoon when I visited them again I found that they had regained their natural position, and shewed no signs of having suffered from the cold. We had also some severe frosty weather afterwards which affected them but slightly. The severe weather in these hills is generally ushered in by storms of wind and rain. This is accompanied with an abundance of thunder and lightning, with showers of hail, which ultimately descends in flakes of snow. It commences pretty regularly about the end of January in each year. Besides torrents of rain during the wet season, and a sufficiency in January, slight showers fall in each month, which circumstance must be attributed to the proximity of lofty mountains having an elevation of 16,000 feet. But we must now return from this digression and proceed with the journal. Above the village of Dhurmsala, and at an elevation of 7200 feet above the sea, the Commissioner of Jullundhur has built a house on a spur of the Chumba range, and in the midst of a forest of oaks and rhododendrons. The view thence is magnificent; clay-slate and limestone form the middle, whilst saliferous sandstone and marls form the lower, and granite the highest, portions of the Chumba range.

15. Lug, another place to which sportsmen are fond of resorting, is situated immediately above Killoo, and between 7 and 8000 feet above the sea. It is the name of a hamlet, above which is a level area of one or two acres in extent. Between this and the snowy range is a deep wooded dell in which the menal and argus pheasants abound. But all over the Chumba range game of every description is plentiful; numbers of fine large mahseer and other fish are found in the deep pools which exist in most of the mountain torrents crossing the valley. These streams are fed entirely by rains and melted snow. The longest mahseer was caught under the walls of Kangra, and weighed 28 lbs. I believe. There is a large forest of fine Cheels around Killoo and elsewhere along the base of the snowy range. Killoo is the name of a village with a fort, and is about 10 miles to the north of Chawun.

16. It is also about 10 miles to the village of Shahpoor, the usual halting place after the first march from Kangra toward Noorpoor. Excepting at the stony beds of nullahs, of which there are several, the

rest of the road is tolerably level and good. About another 10 miles brings you to Kotila (or Koteleh). The road is not so good as on the former march. The fort at this place is of the same style as the one at Kangra, but not nearly so strong. It possesses all its disadvantages only in a much greater degree. It is likewise built on a conglomerate rock. One company under a native commissioned Officer of the 2d Sikh Regiment has charge of it. The fort is raised about 200 feet above the level of two streams, which unite under its walls. Within this angle and at the bottom of the ravine is placed the large village of the same name. About a couple of miles before one arrives at that place the road passes through the village of Jhullugnath, inhabited by Cashmírís, who are employed in the manufacture of shawls. Close by there is a large forest of oaks in which I noticed several instances of the peepul growing out of the oak.

17. Noorpoor is about 12 miles from Kotila, and is the largest town in the Kohistan of the Jhullundhur. The other large towns are Kangrá, Bhuwun, Joala, Monkhee, Shajanpoor, Tira, and Mundinuggur. Next to these come Nadoun, Sookeyt and Sultanpoor. Noorpoor contains about 10,000 inhabitants, principally Cashmírís, whose chief employment is in the manufacture of shawls. Working from sunrise to sunset, with only one hour's relaxation, they earn but  $\frac{1}{2}$  anna a day each; boys from 6 to 8 years are employed as well as men. The method of manufacturing shawls has often been minutely described and therefore it is needless for me to do so in this place. The fort looks more like a dilapidated Serai than any thing else. Two companies of native infantry under a Captain, from one of the regiments of the line stationed at Cajepore, occupy it. The town and fort are built on a tongue of land formed by a considerable nullah making a broad sweep. This stream flows a hundred feet or more below them in a narrow and tortuous ravine. For eight months of the year it is nearly dry. The town covers a considerable space but the streets are narrow, and dirty and the inhabitants squalid and miserable. The whole is overlooked by high hills. A fort, the name of which I forgot to note down, is perched on a conical peak bearing nearly due north. The country round Noorpoor is very hilly, and the road between it and Kotila is decidedly bad. Before the road reaches the former place it passes through a small undulating valley which is not distinguished by any particular name that



I could learn. The young rajah of Noorpoor, an interesting little fellow, is allowed 5000 Co.'s Rs. a year by Government, which is the total amount of his income, as I believe he possesses no jaghir.

18. Soohahlee is about 12 miles further to the north-westward. It is a thriving and neat village, entirely buried in trees and situated in a small but picturesque valley; Dhurr or Dharr, a hamlet some three miles to the north-west of the former, is inhabited chiefly by blacksmiths, who obtain the iron they work from an adjoining wooded hill. From that spot to the Ravee is a rugged hilly country, and the road is bad.

19. From Noorpoor to Puthankot (or Patan Kot), is fully 14 miles. The road lies along the stony bed of the nullah which flows under the former. Puthankot is built on the line of junction between the hills and the plains, where the spurs of the former gradually lessening in height, are lost in the latter. From Roopur on the Sutlej, to Cajeepoor on the Beas, is a long range of hills (the Hooshearpoor) presenting precipitous slopes to the plains; but between the latter and Pathunkot and even beyond, the hills throw out numerous spurs which abut into the plains. At this place is a small fort and a mangoe tope to encamp in. The town did not appear either large or flourishing. A fine view of a portion of the Chumba range is obtained hence. That part seen through a gap in the lower and intermediate hills must be removed a considerable distance from the plains, as it retains its snow when that near Kangra is quite bare. Its crest also appears more deeply serrated than that of the latter. The boundary in this direction of the British territory is marked by the Hosáli canal, which is drawn from the Ravee at the foot of the hills near Sadhori and flows past both Umritsur and Lahore.\* It is crossed by a small bridge soon after leaving Patan Kot.

20. The populous town of Adeenuggur is about 12 miles from the last named place, and on the high road to Umritsur and Lahore. From the canal the water is conducted in numberless rills to irrigate the surrounding country. In consequence of this system of irrigation the road is bad, as the deep ruts in which the water is made to flow traverse it in various directions, and not unfrequently overflow on to the road. A

\* I am indebted for the above information, to Captain A. Cunningham of the Bengal Engineers.

short distance from the town are the ruins of a palace built on the right bank of the canal, over which a bridge has been thrown to connect the opposite portions of the domain. The buildings are rapidly falling into ruins, but the dense groves of mango trees still remain, and afford evident signs of former magnificence. Distant about 8 miles is an extensive swamp (jeel) which abounds with waterfowl and fish. It belongs to one of the numberless Sings of Lahore. Adinahnuggur was built or named by Adinah Beg towards the end of the last century. He was the Fojdar or Military Commandant of Jalandhar.\*

21. Twelve miles E. S. E. of Adinanuggur is Andoorah, the former place being south-west of Noorpoor. It is a large village built on a hillock composed of compact sand, of which kind there are several in the neighbourhood. It is situated within the British territory—a small stream, which flows into the Beas below Hajeepoor making the boundary. I saw nothing worthy of notice at this place.

22. To Juck-o-burr is a march of 15 miles. It is situated just within the hills. In this neighbourhood the general appearance of the low sandstone hills as one approaches them is cheerless and inhospitable. No verdure clothes their naked flanks, and the long coarse grass which covers their slopes looks scorched and dead. The adjoining plain country is also any thing but pretty, the soil being sandy and almost destitute of trees. The road however is tolerably good, and passes through several villages. I travelled along it towards the close of November last. Juck-o-burr is a small village situated in the mouth of a ravine and half a mile from the right bank of the Beas at Rae-ke-puttun. The river between this and Rae on the left bank is divided into two parts by an island. At the abovementioned ghat the force sent against Kangra in May 1846 crossed the river. On the range (Hooshearpoor) behind Rae is a dense bamboo jungle filled with wild boars.

23. A winding ravine, about five miles in length, brings you on to a small piece of table-land on which stands the hamlet of Koonhur, a sweet pretty spot, whence is seen a confused mass of hills and glens bounded to the eastward by the snowy range. Another narrow and tortuous ravine nearly three miles in length, leads on to a similar piece of upland, over which the road passes and descends at Dhumata into

\* For this also I am indebted to Captain A. Cunningham.

the Joala valley. A couple of miles south-east of Juck-o-burr, and on the opposite side of the Beas, the Jaswun and Hooshearpoor ranges unite, and throw out a single ridge as far as Hajeepoor, whilst the principal chain keeps a north-westerly direction, after allowing a free passage to the Beas. From the right bank of the river, and from between Dhamata and Juck-o-burr, this sandstone range stretches out in one broad belt towards the north-west, and passing between Noorpoor and Puthankot, reaches the Ravee, beyond which river I suspect that lofty hills of the saliferous formation abut immediately on to the plains. However, that portion of the sandstone range lying between the Beas and the Ravee maintains its usual characteristic features. They consist of strata of compact sand, soft friable sandstone and loose gravel. But the hilly track between Noorpoor and the Chumba range is formed of sandstone and marls with thick conformable beds of calcareous conglomerate indurated into a solid rock. This formation extends also to the Ravee and composes probably a large portion of the territory belonging to the Rajah of Chumba.\* This is under the protection of the British Government, to which he pays an annual tribute.

Dhamata is a considerable village on the banks of a dry nullah. It is well wooded. From there a road through Hurreepore leads to Joala-mukhi, which is about 25 miles off. The jaghir belonging to the Rajah of Hurreepoor. Golche is a very small village and situated on the right bank of the Beas.

24. Nagrota is likewise a large village built on some rising ground on the left bank of the Guj. It is also situated at the entrance of a ravine which affords a passage from one valley to the other for the Guj that there enters the Joala-mukhi valley. The distance between Nagrota and Dhamata is about 9 miles, which is somewhat more than the width of the valley at this point, as the road crosses it diagonally. The former is tolerably level, and the latter good. Besides the Guj, another considerable stream flows across the valley, into which the former empties itself before reaching the Beas. In May 1846, large quantities of tobacco were growing in the fields, also the Oleander and Cassia fistula were in full blossom, adorning the glens with their red and yellow flowers, as well as scenting the air with their fragrance.

\* The saliferous formation of the Kangra district rests on the Silurian, according to Dr. W. Jameson.

Near Nagrota, but on the opposite side of the stream, grow a couple of the largest silk cotton trees (*Bombax heptaphylla*) I have ever seen. The one I measured was 24 feet in girth. There is a banian tree at Juck-o-burr measuring  $38\frac{1}{2}$  feet in circumference, but what are these to the noble cypress trees of Mexico, or the still more extraordinary jana trees of Australia, and the locust trees of southern America?\*

25. The next march and a half are about the most tiresome that could be imagined. The road lies along the bottom of a deep and serpentine ravine with the Guj flowing through it, which stream has to be forded 51 times before the Kangra valley can be entered!—several of the fords are 3 feet deep, the current is strong, and the bed of the torrent covered with boulders of every possible dimension. Travelled masses of granite too, those stumbling blocks to erratic geologists, are every where scattered about. This ravine is about 13 miles in length and is by no means a safe route to take, as any sudden shower of rain increases considerably the depths of the fords and renders them dangerous, if not impassible. Its average breadth is about 300 yards, but it contracts a good deal in some parts, whilst it widens in others and forms valleys. Some low bush jungle with a few cheels grow on the hills on either side. The dates are well cultivated, whilst here and there the gentler slopes are terraced into fields. The siege train was taken by this route in 1846. Tutti-pani is the usual halting place, and is 9 miles from Nagrota. This spot has derived its name from a hot spring which issued from the hills forming the north-western boundary of the valley. The hills around are composed of strata of sandstone and marls and conformable beds of conglomerate. The length of the valley is about  $1\frac{1}{2}$  mile and its breadth a quarter. It is moreover divided into two nearly equal parts by a low spur. The soil at its base is a stiff red clay well suited for brick making. The bráhmans as usual have taken advantage of the hot spring and covered it over with a temple, surrounding the exterior with peepul and other trees. They have also fixed an artificial stone pipe for the jet-d'eau to run through, whilst they collect its tepid waters in a small tank for the purpose of enabling the pious Hindu to bathe in.

\* Vide Humbolt's "Personal Narrative," Landon's "Bushman, or Life in a new country," and Lindley's "Vegetable Kingdom."



26. Having wound your way through four miles more of this irksome ravine you enter at last the long wished for valley of Kangra. One mile further is Bunda ghat. This ghat is over a considerable stream which joins the Guj at the mouth of the pass. The town of Bhawun is four miles N. E. of this, and the road is along a level country intersected by three or four deep torrent beds. There is however another route by which a good deal of the unpleasant work of fording may be avoided. This can be done by following the course of a very narrow ravine which turns off to the right about a mile from Puttipani. It brings you out upon a high hill, from which the road descends into the valley along the crest of a spur and joins the other one midway between Bunda ghat and Bhawun. The distance is rather increased by the latter route. There is also a footpath which leads over the hills from Nagrota to Kangra, but I have never travelled along it. In a village not far from Bunda ghat, and looking down on to the Guj, I saw a bair tree (*Zizyphus jujuba*) measuring  $3\frac{1}{2}$  feet round, which appeared to me of rather an unusual size.

27. Having arrived at the point from which I started, and not wishing to go over the same ground twice, I will make a fresh start from Joala-mukhi. Kotlair and the former place lie nearly due north and south of each other and about 25 miles apart. I purpose describing this route in the first instance, and afterwards that through Muhulmooree and Sookeyt to Mundi-nuggur.

28. From Joala-mukhi to the Beas opposite Nadoun, is 9 miles. The road is level and good. Nadoun can hardly be called any thing more than a small town or large village, although the numerous Hindu temples, and extensive ruins, remind one of its former greatness. It is built on the left bank of the river and rather more than 100 feet above it, but the opposite bank is very low, and shelving. A fine flight of steps, made of sandstone, leads down to the water, which here presents a wide unruffled surface. Its width is probably 150 yards, and the current is barely perceptible, although its average rate cannot be less than four miles an hour. The latter of course varies according to the season. In the shallows shoals of fish may be seen basking in the sun. There are plenty of fine trees in and about the town, and the country around is decidedly pretty. There is an old saying "whoever comes to Nadoun who would wish to leave it?" which might have

been true in the days of its prosperity, but I cannot say that the place now holds out any particular inducements to take up one's residence there. I had with me both Mr. Moorcroft's and Mr. Vigne's travels, and was much struck with the general accuracy of the former, but I cannot say as much for that of the latter, for whose inaccuracy I can only account by supposing that he did not make sufficiently ample notes on the spot, but trusted too much to his memory. Of course I can only speak of that portion of Mr. Vigne's work which relates to this Kohistan.\* Jodbeer Chund, the Rajah of Nadoun, is a tall, stout and handsome man. He is the natural son of the great Sansar Chund, the late Rajah of Cotoche. His jaghir is worth 32,000 a year. He has a nice house situated on the banks of the river, and about a mile from the town. Near the house is a Changan,† on which in former times hockey on horseback used to be played. From Nadoun are three roads leading to as many different places. The principal one is that which passes through Muhulmooree and terminates at the Sutlej opposite Bilaspoor. The next one follows the course of the Beas and enters the Kangra valley at Shujanpoor. Tira,‡ the third one, is the route to Kotlehr.

29. The first march in the last named direction is to Dhanata, a village about 8 miles off. It is built on the north-eastern slope of the Chou-mukhi (or Sola-singha) range, the highest peak of which rises fully 1500 feet above the valleys on either side. Between Nadoun and this place the surface of the Joala valley is very uneven, and intersected by many deep watercourses; the one which we crossed several times on the road is called the Mamke-nuddee. It empties itself into the Beas below Nadoun, whilst the Koonhar, another tortuous stream to the north-eastward of the Mam, does the same above that town. The external configuration of the Pergunnah of Muhulmooree as seen from a height resembles a heavy swell at sea. Dhomata is remarkable for having an excellent stone aqueduct which conducts the water from the range in the rear to the tank within the village. It is about three-fourths of a mile in length, and was built by the present Rajah of Nadoun, in whose jaghir it is situated. I was told that the entire village was destroyed by

\* I have since learnt that the gentlemen of the Thibet Mission also found Mr. Moorcroft the more accurate of the two.

† Changan, a level field.

‡ Shujanpoor is 12 miles from Nadoun.

fire in 1846, or a twelvemonth before I visited the place, yet I could discover no traces of the occurrence. Just above where the spring issues which supplies the village with water, immense calcareous blocks are lying about that were probably formed by the agency of some spring in the neighbourhood, but which has now ceased to flow. This leads me to say a few words concerning Captain Newbold's theory of the formation of kunkur.

"The kunkur, as may have been collected from what has been just stated, is not of zoophytic origin, like coral reefs, nor does it appear to have been generally deposited or chemically precipitated from the waters of an ocean or inland lake, but like the travertines of Italy it may be referred to the action of springs, often thermal, charged with carbonic acid, bringing up lime in solution and depositing it, as the temperature of the water gradually lowered in rising to the earth's surface or in parting with their carbonic acid. After depositing a portion of calcareous matter in the fissures of the rocks by which it found a vent, the calcareous water appears to have diffused itself in loose debris, régur, gravels, and clays, usually covering the rocks, and by force of chemical affinity the disseminated particles of lime gradually congregated into the nodular and other forms which we see them assume. These nodules are sometimes arranged in rows like the flints in chalk, and from some of them project delicate spiculæ of carbonate of lime, which would have been broken off had they been drift pebbles, as is supposed by some."\* Of the tufaceous origin of kunkur there can be no doubt; but to my mind the latter part of the above theory, viz. that "by force of chemical affinity disseminated particles of lime gradually congregated into the nodular and other forms," is anything but satisfactory, and as to the existence of delicate spiculæ being a proof of the masses not having been drifted, I think it insufficient, for by taking a lump and causing water to be slowly filtered through it spiculæ will be formed; the spiculæ in question therefore may have been formed by the agency of rain-water percolating through the bed of kunkur; the chief difficulty however is to account for the nearly universal dispersion over India of the kunkur formation, for as Captain Newbold says, "the kunkur formation is irregularly distributed in overlying patches over perhaps one-eighth of our area. I know of no tract entirely free from it with the exception it is said of the summit of the

\* Geology of Southern India, by Captain Newbold.

Nilgiris. I have seen it however at the height of 4000 feet above the sea, among the ranges on the elevated table-lands. It is most abundant in districts penetrated and shattered by basaltic dykes, and where metallic developement is greatest, for instance in the copper district of Nellore and the chrome and iron tracts of Salem. It is perhaps least seen in localities where laterite caps hypogene or plutonic rocks." Thus it appears by no means certain or even probable that each bed was formed at the locality in which it is now found, and I believe I am right in saying that a substance analogous to kunkur is now being formed only in the Himalaya. In the Kangra district rounded lumps may be seen scattered about the surface on the table-lands, and hill-sides, as well as in all the ravines, in the same manner as boulders. As there seems no doubt of the bursting of lakes in former times, one would suppose that great quantities of that kind of calcareous matter must have been swept into the plains, and thus extensive beds might have been formed adjacent to the hills.

30. The road leading over the Chow-mukhi ghat is very steep and bad. The fort of the same name is a mile to the south-eastward and somewhat higher. About half a mile beyond this again, and on the opposite side of a gap in the ridge, is the Sola Singha fort perched on the highest peak. The positions of these two forts are very strong, being defended by precipices on three sides, and a sharp rocky ridge on the other, on which it would be difficult to effect a lodgment, but these natural advantages are more than counterbalanced by the absence of water, to obtain which the garrison would have to proceed beyond the protection of their guns. The range on which these forts stand is in parts densely wooded with bamboo jungle. I obtained the following bearings from the summit near the Chow-mukhi :—

Forts Joalo-mukhi and Nadoun,	Due north.
The forts of Kotlehr,	Due south.
Ditto of Kumleh-gurh,	N. E. by E.
Beas visible below Nadoun,	N. N. W.
The range runs	N. W. and S. E.

The views on all sides are both extensive and beautiful. Doongla or Toongla, is about 6 miles from the last halting place. It is a small village prettily situated in the Kotlehr Dhoon. On the slope of the Chow-mukhi range immediately in its rear is a thick bamboo jungle in



which game is said to be plentiful, but I should think it would be next to impossible to get at it.

31. The march across the Dhoon is particularly interesting to the geologist. Its surface presents a singularly disturbed appearance, and at about the middle of the valley the road enters a large basin-shaped hollow where the strata slope outwards with a somewhat *quâ quâ* versal dip. It looks like the remains of an ancient crater, but such I think it could never have been, as I could discover no signs of igneous action. However the whole of this valley deserves a most attentive examination. One principal stream which empties itself into the Sutlej serves to drain the valley. This march is about 10 miles long and terminates at a hamlet, called Dhook. It is situated at the base of the high ridge of Kotlehr, the ascent of which is rendered tolerably easy by a broad pathway made at the order of the rajah who owns the jaghir. The rajah of Kotlehr is an old grey-haired man with nothing peculiar in either his manners or his person. His estate produces him I believe an income of 17000 Rs. a year. On the summit of the Kotlehr ridge is an extensive fortification composed of five detached works. The three principal ones, as well as the forts of Chow-mukhi and Sola-singha, were partly dismantled whilst I was there. From the highest point the views of the Sutlej, of the Jaswun, Sekunder, and Chumba ranges, with the intermediate valleys, are very beautiful. The *pergunnah* of Kotlehr is separated by the Sutlej from Kystore, from that part of it at least which lies within that remarkable bend the Sutlej makes to the north-westward. The *saliferous* formation crosses the river at that point and passing through Kystore and Subathoo, extends I believe as far as Almorah.

32. From Dhook I travelled north-eastward across the valley and over the Sola-singha range to the hamlet of Bursur. It is built on the north-eastern slope of the range, which is there covered with *cheel*. Thence also a large forest of\* the same stretches out in a northerly direction towards the Joala range. This march is 9 miles long. The road is bad, especially up to the ghat, the ascent to which is very steep for horses. The crest of the pass may be elevated 1000 feet above the valleys on each side.

33. Bohota is a large village pleasantly situated, and about 12 miles

\* Vide Appendix.

distant. Before, however, you can get there the Joala range has to be crossed, which from thence to the Sutlej is very low, and might be easily passed over without being noticed but for the difference in its composition from the surrounding country, which is covered with a boulder formation interstratified occasionally with coarse sandstone. The Joala range on the contrary is composed of sandstone and marls of the saliferous period.\*

34. About four miles further is the small village of Koorooe, the residence of the Rajah of Muhulmooree, the ex-Rajah of Cotoche, the grandson of the great Sansar Chund. The village is situated in the midst of low rounded hills covered with coarse grass; the road from Nadoun to Bilaspour is crossed between this and Bohota. Mr. Vigne thus accurately describes the place:—"At a place called Kruhin (Koorooe?) situated in the midst of low and treeless hills covered with rank herbage I found the residence of the ex-Rajah of Tira, and his brother, the grandsons of the once powerful Sinsar Chund". . . . . "The residence consisted of two or three low thatched houses, and they were in the receipt of 30,000 Rs. (3000£) a year, which were collected from the surrounding country by permission of the Maharajah" (Runjeet Sing,†. . . . . "The elder of the two brothers, and the rightful Rajah of Tira, were very civil and gave me a breakfast on the morning of our departure. Being Hindus they did not eat with me themselves, but a table was placed for me beside them, and they talked to me during the repast, which was served up in dishes made of dock leaves sewn together, and my drinking cup was also of the same material. The Sikhs are less particular in these matters than the natives of Hindoostan, and will eat twice and oftener out of the same plate, and many of the Sikh Sirdars are in possession of European China, but the Hindu, more especially the Brahmin or the Rajput, of which latter caste was the Tira Rajah, will not eat twice out of any vessel that cannot be cleaned with earth, and consequently they are eternally scouring their brazen cooking pots. When therefore they play the host the Hindus (and the Sikhs also in many instances) cause their dishes to be made of dock leaves (*Butea frondosa*) which are thrown away after they

\* Vide a report on the Kohistan of the Jullundhur.

† For further particulars of this family vide travels in Cashmere, &c. by G. T. Vigne, Esq.

have been used, and expense of purchasing new crockery is avoided. The comparative absence of superstitious ceremony on the part of the Sikhs would render them as Sipahis better adapted for actual service than the other natives of Hindoostan."..... "The young ex-Rajah shewed me a friendly letter which his grandfather had received from Lord Lake by the hands of an envoy whom he had despatched to wait upon his Lordship after he had followed Holkar into the Punjab, and also a chit, or writing, by Mr. Moorcroft, given to, and in favor of Rajah Sinsar Chund, in which that open-hearted, intelligent, but unfortunate traveller, had spoken in the warmest terms of the kindness and attentions he had received by him." The British Government has not only left the Rajah in the undisturbed possession of his jaghir, but has increased his income by an annual grant of 18000 Rs. I saw the man Mr. Vigne writes of; his name was Runbeer Chund, and that of his brother, the present Rajah, is Purmode Chund. What Mr. Vigne describes as having occurred on his visit, took place in nearly the same manner when I was there. My friend and myself dined with them\* on Christmas Day, but we had our own plates and dishes, as well as chairs and table. As wild hogs abound in the neighbourhood the principal dish was a fine joint of roast pork, besides palaws, curries, &c., and afterwards pastry covered with tinsel made by the ladies of the zenana! I could not help comparing the whole affair to the feeding time at the Zoological Gardens in England, when people congregate to see the wild beasts fed. Whilst the Rajah and his brother the Meer Sahib were trying their best to amuse us with an endless variety of questions, I could see that whatever we eat or drank, every motion in fact was attentively watched by themselves as well as by their courtiers, who sat in the adjoining room, and to add to our bewilderment, I discovered that the ladies were secretly glancing and simpering! To refuse the racy dainties made by such delicate hands while their fair owners were looking on would have been extremely ungallant, so, seeing no help for it, we set about our task with the best possible grace, but, alas! after such a hearty meal of pork there was little relish for the oleaginous delicacies so kindly prepared for us. So having put a bold face on the matter we ordered our kitmutgars to clear the table amidst many a gentle reproach of wah! wah! wah! from behind the curtain. After dinner the letters of Lord Lake, Mr. Moor-

\* Runbeer Chund died a few days afterwards.

croft and Mr. Vigne were produced, and read, after which my friend translated from the works of the last two gentlemen several passages relating to the Rajah's family and their reception whilst passing through his jaghir, but when he came to the passage in which Mr. Vigne mentions that the Rajah and his brother had dark complexions, he just reversed the sentence and read out that they were fair! In an instant the eyes of the Royal brothers sparkled, and they looked at one another apparently much delighted, a fair complexion being considered an indication of royal blood; nothing pleased them so much as that sentence. However, the Rajah need not have been ashamed of his complexion, for his aristocratic and gentlemanlike manners shewed at once that he was born a prince. His manners were particularly refined and his gestures graceful. He was the first native I had met whose society was agreeable to me. His features were mild and had evidently been handsome. However of late years he had been a great sufferer from a large goitre which disfigured his neck. That frightful disease slowly wasted away his frame and at last killed him, on the 5th January 1848, only a few days after we left him.

Mr. Moorcroft thus writes of this man's grandfather:—"In the evening I waited upon the rajah at his desire, and found him with his son and grandson in an open building in a garden.\* Rajah Sansar Chund is a tall, well formed man, about sixty. His complexion is dark but his features are fine and expressive. His son, Rai Anirudha Singh, has a very handsome face and ruddy complexion, but is remarkably corpulent. He has two sons, one of twelve and the other of five years of age, both darker than himself. Sansar Chund was formerly the most powerful Rajah from the Sutlej to the Indus. All the potentates from the former river to Kashmír were his tributaries, or dependants, and he was extremely wealthy, possessing a revenue of thirty-five lacs of rupees. He is now poor and in danger of being wholly subjected to Runjeet Singh. His misfortunes are mainly owing to himself, and his decline presents a remarkable contrast to the rise of his neighbour, and now paramount lord, Runjeet Singh."† As Mr. Moorcroft paid his visit on the 16th June 1820, the late rajah must have died at the premature age of forty,

\* At Shujanpore Tira, afterwards described.

† Vide "Moorcroft's travels in Bokhara, Afghanistan," &c., for further interesting particulars.



and his brother must now be about 33 years of age. The present rajah is a large, stout man with a plebeian countenance. He is a merry good-natured fellow, and puts one in mind of a jolly English hotel-keeper. He has an only daughter, and seems likely to die without an heir, in which case his property will escheat to the Government. Before I return from this long digression and continue my journal, I must mention what every body conversant with Indian history will acknowledge as a singular instance of fraternal love and a proof of the amiable disposition of the present rajah. During the long illness and helpless condition of the late rajah, his brother took the greatest care of him and managed his estate. The latter, moreover never forsook his brother when the Sikhs were treating him with every kind of indignity and depriving him of the fairest portions of his jaghir, giving them to his illegitimate brothers, who espoused their cause. Such has been the noble conduct of Purmode Chund, although by treachery and murder he might have possessed himself of his brother's property many years ago, as well as have ingratiated himself into the favor of the Sikhs, who were then overrunning the country. When we compare such conduct to that usually pursued on similar occasions by Indian princes we cannot but feel convinced of the purity of the attachment. What a refreshing contrast does this instance of disinterested devotedness form to the murderous treachery of the successors of Shah Jehan !\*

35. Leaving Koorooee we marched over about five miles of low naked hills until we came to the ridge which separates this uninteresting country from the Seel-khund. An ascent of 500 feet brought us to the summit, whence we descended into a long and fertile valley. It appears to stretch out as far as the Sutlej in the neighbourhood of Bilaspoor, having its northern extremity bounded by the rugged pergunnah of Kumleh-gurh, and its eastern flank by the picturesque heights of the Sikunder-ke-dhar. A stream called the SIRR I believe, which is nearly dry at this season of the year, flows down the centre and empties itself into the Sutlej. Once in the valley our road turned to the southward, and crossing it diagonally brought us to the foot of the ghat which leads over the Sikunder range into Sookeyt. We encamped at a small village

\* I regret having now to add that Purmode Chund, as well as the Rajah of Jaswun, has been weak-minded enough to rebel against the British Government, and has consequently forfeited his jaghir.

called Buttail, distant about 15 miles from Koorooee, and situated at the base of the last mentioned range. The sides of the latter have been terraced into fields to a very considerable height wherever the slopes permitted, whilst the remainder is covered with forests of pine (*P. long.*) Amongst the cultivation are numerous thriving villages and hamlets. The greater part of the Seel-khund\* belongs I believe to the rajah of Mundi-Buttail, is not the regular halting place, but a village higher up the range called Hutli.

36. After a long and tedious ascent by a good road through villages and pine woods we arrived at the summit of the ghat. Looking over our previous day's journey the most conspicuous objects were the shattered peaks of the Chumba range far below which rises the serrated ridge of Kumleh-gurh. Then follow the low and treeless hills of Muhulmooree, which in their turn are succeeded by the Joala range, and this last in the far west by the Chou-mukhi and Kotlehr ridges. The range on which we were standing separates the Seel-khund from the Bul Dhoon, a profound valley bounded to the eastward by the lofty Nautchney-ke-dhar. In the depths of the valley appears the town of Sookeyt, surrounded by dark woods, near which glides the Sookeytee river, flowing to the northward and glittering in the rays of the sun like a silver cord. On isolated peaks of the Nautchney-ke-dhar, as well as on the Sikunder range, are many towers or forts, which but a short time ago afforded shelter from the merciless swords of the Sikhs to hundreds of wretched beings. To these strongholds the peasantry used to flee for protection from the rapacity of their heartless rulers. By a steep and good road we descended into the valley and halted at the first village. In the Seel-khund we passed an extensive encampment of gypsies, the first I had noticed in this country. Also just after leaving Buttail I remarked a heap of stones placed in the centre of the road. These are formed I believe by Tartar tribes who invariably pass them on their right hand, as well as throw a fresh stone on the pile.† The above however, must not be confounded with the conical piles raised on conspicuous points or peaks in honor of their gods by almost every tribe of mountaineers in the world, whilst they are in a state of barbar-

\* I believe it to be the same as the one which Mr. Moorcroft calls the Bathel valley.

† Vide Loyd's and Gerard's "Travels in the Himalaya."

ism. It is also a favorite practice of the Moguls in Central Asia to erect these heaps to the honor of their gods, by whom they are called "obos."\*

37. Yesterday's march being a fatiguing one of 14 miles, we were not a little glad at finding the Sookeyt was but 5 or 6 miles off, and that the road was level and good. The residence of the Rajah of Sookeyt is about two miles from the capital, and is built on the western slope of some high hills, whilst the town is placed at the foot, where their slopes are much more precipitous. The situations of both are picturesque, and a fine view of the Dhoon is obtained from the former, but the building itself is not worthy of a description, nor has the town any thing peculiar about it save its extreme unhealthiness in consequence of being surrounded by a dense jungle. The Rajah and his sons have very plebeian countenances, and are not polished in their manners, but these deficiencies are fully compensated by their frank and open way of speaking. The Rajah is evidently above bespattering Europeans with loathsome flattery, and telling lies for the sake of pleasing, like he of Mundi. When it was mentioned to him that we had been given to understand that he was a great friend of the Rajah of Mundi, he replied "Yes, you may call us friends, for it is of no use our quarrelling, as the British Government will not permit us to fight. The Mundi-walla however openly pretends to be a great friend of mine, but in reality is ever striving to do me as much harm as he possibly can." Were the British influence withdrawn but for a short period it is not difficult to foresee what would be the result. These two rival Rajahs would in collision with each other, depopulate villages and lay waste fields; and it would indeed be difficult to say to how great an extent barbarities might be practised upon the vanquished by who ever became victorious. The will of the Rajah of Sookeyt is law within the limits of his own jaghir,† which is said to be worth about 60,000 Rs. a year. Out of that sum however, he pays the Government 11,000 Rs. annually.

38. The Bul Dhoon, or valley of Sookeyt Mundi‡ is very fertile and entirely under cultivation, excepting a small swampy preserve which sup-

\* Vide travels of the Russian mission through Mongolia to China, by George Timkowski.

† As is also that of his neighbour in Mundi.

‡ So called because part is in Mundi and part in Sookeyt.



plies the table of the Mundi-walla with game, and sport in procuring it. The wild boar abounds in the wooded heights around, from which they descend and commit great havoc in the fields of wheat and sugarcane. The villages are generally situated on the slopes of the mountains, where the inhabitants escape the effects of malaria. On the Sikunder range are many picturesque-looking villages and plots of terraced land which are limited at their upper extremities by forests of pine, but on the opposite side of the valley the slopes are more precipitous and covered with larger tracts of jungle and forest, whilst the hamlets are more scattered and the cultivation is less extensive. The summits of the Nautchney-ke-dhar are also more lofty and are frequently covered with snow. Mundi-nuggur is about 12 miles north of Sookeyt, and the road all the way is excellent. It runs through the valley for the first 10 miles or so, and then passes through a narrow ravine along the left bank of the Sookeyt river. Altogether it is one of the most delightful marches I have ever made, for the road is nearly as level as a bowling green for the greater part of the distance, and look whichever way you may one cannot fail to admire the majestic scenery. On the road we met scores of coolies carrying on their backs kiltaloads of the Mundi salt. I have seen some of it in the bazars of Loodiana and Subathoo. It is very impure and causes the body to swell. From this circumstance I should suppose the people either do not or cannot cleanse it sufficiently. There is a curious custom practised in this neighbourhood. The women, gaily dressed, assemble in groups to greet the stranger with songs as he enters each village, for which honor he is expected to bestow a rupee on each knot of Syrens which I thought was dear enough for such melody. The rajah of Mundi is a handsome man, but his appearance and manners are rather effeminate. He has two sons and is himself the natural son of the late Rajah.\* His income is reckoned at four lacs of rupees a year, nearly the whole of which is derived from his salt and iron mines. Half of the above sum he pays annually to Government. The present Rajah is very fond of copying English customs, such as shaking hands, driving a buggy, &c. Adjoining his zenana, which is a great ugly building, he is erecting a palace of sandstone which promises to be a handsome residence. In front of this is a large square tank, around

\* For an account of this man see Moorcroft's travels.



which lies the town, a large and thriving place. A small garden enclosed by high walls, in the centre of which the Rajah has built a small two-storied house after an English model, likewise adjoins the zenana. The rooms are covered with elegant paper, the windows and doors are glazed and have curtains hanging on each side moving on brass rods. The furniture consists of a rose wood table, chairs, sofa, chandeliers, mirrors, and pictures, whilst excellent Brussels carpeting covers the floor. The pictures consist of an engraving of the Queen in her coronation robes, and then of Her Majesty taking a ride in Windsor Park, and one of Prince Albert, shewing the bust encircled with a wreath of shamrock, thistle, &c. I am able to give but few particulars of Mundi-nuggur which are not already known.\* It is divided into three parts. The town is built within the angle between the left banks of the rivers Sookeyt and Beas : a space between the town and the mountains in the rear being set apart for the lowest caste of the inhabitants. The next portion may be called the suburbs, which consists of scattered dwellings on the slope of the Gogar range, which terminates abruptly on the right bank of the Beas. The last lies between the right bank of the Sookeytee and the left of the Beas. It is a level piece of ground, of a triangular figure and about seven acres in extent. This field (for it is nothing more) has an excellent road all around it (on which the Rajah takes his drives in a buggy) and may be styled the mall. Our tents were pitched on the centre of this plateau. The town has a neat appearance from the circumstance of all the houses having slated roofs. On the summit of a spur behind the town, the Rajah has built a neat Hindu temple ; he was also building another on the left bank of the Beas. He has caused many of the streets to be widened and levelled to enable him to drive about in his gig. Perhaps at no distant day the inhabitants may be indebted to the vanity of their ruler for wholesome sanitary reforms, as they are already for facilities of travelling. I fancy that pigeons are held sacred, as there are several cotes in the principal streets filled with that sort of bird. The sides of the enclosing mountains are precipitous, and mostly covered with dense jungle, in which hogs and various kinds of deer abound. The climate is as hot as that at Rampoor on the Sutlej during the hot weather and rains, but snow falls at both the places during the winter. The vegetation is decidedly

\* Vide Thornton's Gazetteer of the Provinces adjacent to India.

tropical ; a species of palm, plantains and peepuls, thrive here, although pines and stunted oaks grow nearly at the water's edge in the ravine which unites it with the Bul Dhoon. I saw one or two stunted peepuls near Bajoura in Kulu, which cannot be less than 4500 feet above the sea, as Sultanpore, but six miles higher up the stream, is 4584 feet. The winters are very severe in Kulu, although the summers are hot.

39. After taking leave of the Rajah we commenced our journey towards Kulu on the 10th January. We crossed the Beas in a boat and proceeded for about two miles along its right bank and then commenced the ascent of the Goger range, a long and tedious operation. The descent from the ghat to the right bank of the Hulhu (or Oohl) is very sudden and steep. That river is nearly as large as the Beas at Mundi-nuggur. We crossed it by a Sanga and kept along its left bank until we came to the point where the Ootursal flows into the Hulhu ; we then continued along the left bank of the former until within a mile of the hamlet of Kamaud, where we halted at a Barra-durree built at the expense of the present Rajah of Mundi. It is placed in a deep glen, and the surrounding mountains present either bare precipitous cliffs or smooth but steep declivities covered with coarse grass. As from the Barra-durree no trees save a few cheels are visible, and the encircling mountains are rocky, precipitous, and barren, the surrounding scenery is desolation itself. This gloomy spot is about 10 miles from Mundi-nuggur.

40. When we arose the next morning a sharp hoar frost covered the ground and a covey of Chukor\* were feeding around our tents. Having started we kept on the left bank of the Ootursal for about  $1\frac{1}{2}$  miles, and after fording it we turned off to the left up a ravine which leads to the pass over the high range of Tiri. Passing through some fields of wheat and by some hamlets, we came upon a few rhododendrons and oaks, some of the former being in full blossom ; afterwards for the last 500 feet we ascended through a continuous forest of oaks, rhododendrons, and other trees, and though the sun shone bright and was hot, a hard frost covered the ground, and large patches of snow lay here and there in the pass as well as on the higher peaks. Cedars, oaks, and pines, cover in dense forest the crest of the Tira range. The eastern slope was likewise bound up in snow and frost, and is covered nearly to the

\* Perdix Chukor.

bottom with a dense forest impervious to the sun's rays. Through this we descended many hundred feet over beds of frozen snow, and although the great exertion of ascending had caused us to perspire freely, the instant we commenced the descent on the other side all perspiration was checked, and it was as much as we could do to keep ourselves warm. The path the whole way continually crossed and recrossed the bed of a torrent, until we halted at Bajoura, in the valley of the Beas in Kulu, from which river we were then scarcely half a mile. At that place is a large Serai-like enclosure divided into two unequal parallelograms, and called a fort. At each corner is a quadrangular tower divided into four stories, and surmounted with a Chinese sort of slated roof. The Himalaya between the Ravee and Sutlej rivers and the Chumba range usually presents towards the plains abruptly steep fronts and comparatively gradual slopes, in the opposite direction from the strata dipping in general to the north-east, and as this is frequently repeated, we have a succession of ascents and sloping sides, with a deep and often wide valley intervening between the successive ranges, and thus in travelling across this tract we have a succession of ridges and valleys to pass over, and, in proportion to the elevation to experience changes of climate, and to witness a repetition of geological structure and of animal and vegetable forms which are dependant on this and on the climate.

Thus far the physical features of this district accord with those of that portion of the Himalaya which lies between the Sutlej and Kalee rivers, and then the similarity ceases, for in the latter a deep and narrow ravine generally intervenes between two successive ridges, in which usually runs a small river flowing either towards the Ganges or into the Jumna, or their feeders, or into those of the Sutlej or Kalee, but the drainage of these great rivers is every where separated by transverse ridges which connect the parallel ones, having their points of junction often projected into peaks.\* By proceeding along these spurs one may penetrate far into the interior without having occasion to descend into the ravines, a plan which cannot be adopted in the Kangra district.

41. A march of six miles along a good and level road on the right

\* Vide "Report of the Mineralogical Survey of the Himalaya mountains lying between the rivers Sutlej and Kalee," by Capt. Herbert. Jour. As. Soc. 1842, also Dr. Royle's "Flora of the Himalaya mountains."



bank of the river brought us to Sultanpore, the capital town of Kulu. This portion of the Beas\* flows through a ravine rather than a valley. At some places the ravine must be nearly a mile in width. The hills on both sides, excepting just at their crests, are bare and treeless, a great part of the valley strewed over with trunks of trees, boulders, and silt, which were brought down by the great flood that occurred during the rains of 1845. We passed only one hamlet on the road, for the majority of the inhabitants reside high up on the slopes of the surrounding hills, to avoid fever and ague, which are prevalent in the valley during the rainy season. Sultanpore is a small straggling town, nearly a fourth part of which is composed of the Rajah's residence and out-buildings.† The Rajah is constantly complaining that the Government promised him a jaghir worth 12,000 Rs. a year, but gave him one worth only 8,000. He is a diminutive and insignificant little being. The Serbari flows from the westward to the Beas at Sultanpore, which is built within the angle formed by those two rivers. Beyond this the valley of the Beas contracts and the enclosing mountains appear to be more lofty. When I saw them, they were covered with snow to nearly their bases which circumstance prevented my proceeding further in that direction. For the same reason I was unable to visit the lead mine which exists in the neighbourhood, and I believe within the Rajah's jaghir.

42. Disappointed at not being able to proceed northward I determined to make the attempt to the eastward and therefore fixed upon Maruni-karu as the goal. From Bajoura to Brahma-kotee is about 10 miles, and the pug-dundee, or foot path is very bad. I was obliged in consequence to leave my horse behind. Two miles above Bajoura the Beas is crossed on bullock skins, and for the rest of the way the route lies along the left bank of the Parba or Parbati, which flows many hundred feet below. Within the angle formed, on the left bank, by the two above mentioned rivers, is the village of Bho-en which was a thriving place until nearly destroyed by the Sikhs. After leaving that village we entered the glen of the Parbati, which for the first two miles is very narrow and the sides of the mountains precipitous. Afterwards, how-

\* The Beas is divided into two parts by an island covered with jungle, near Bho-en, and below and above Sultanpore.

† There is a fair held in the town during the rains. (Vide Appendix C.)



ever, it widens and the slopes of the hills on the left bank become much more gradual and are laid out in fields and villages. Brahma-kotee is a large and thriving village. At certain seasons of the year woodcocks and pheasants are plentiful in the neighbourhood.

43. To Main-karu is another ten miles, the path ascending and descending as often as in the march before. For a good part of the way we went through a forest of pines and cedar trees, which latterly reached the edge of the water. We also passed through several populous villages, and saw extensive plots of cultivation. Within a mile of our destination we crossed the river by an excellent sanga, under which the water roared and fretted in its contracted bed. During the winter months the frost is seldom if ever disturbed by the rays of the sun, which then penetrate but for a few hours daily the gloomy depths of the ravine. When I arrived a hoar frost covered the ground, whilst a little higher upon each side the slopes of the mountains presented one vast unbroken sheet of snow, the dazzling whiteness of the latter being relieved by the dark green pines, which appeared darker by the contrast. To the eastward also it appeared as if the ravine were abruptly terminated by a colossal mountain of snow from which chilling blasts of wind every now and then swept through the glen. Then again the mysterious jets of steam, which slowly curling upwards and uniting formed one vast column of vapour until lost in air, contributed not a little to enhance the solemn majesty of the scene. A remarkable increase in the temperature is perceptible within a hundred yards of the boiling springs, and the surrounding atmosphere is so charged with the steam that it saturates every thing within its influence. In a few seconds I found every thing about my person quite wet, and when I ascended to some bare cliffs, on which the snow was not lying, to examine the rocks, my clothes were immediately frozen as stiff as pasteboard, and greatly impeded my walking. In fact it is a difficult matter to find a spot for one's tent free from this inconvenience, for should the wind veer, which it does frequently, the whole body of steam blows over your tent and baggage, wetting them through in a minute, which as soon as the blast is over or driven in another direction, are taken possession of by the frost, only to be relinquished again however at the next visitation. As I was not suffering from any malady, but on the contrary never felt better in my life, I felt no relish for

vapour baths and icy accompaniments, so I retraced my steps and encamped on the opposite side of the river near the wooden bridge, which spot I recommend all future travellers to select, without they wish to undergo the same severe treatment. The springs are very copious, and issue from the ground in half a dozen different places. They all deposit large quantities of calcareous matter, which is first of a brick red color and afterwards when dried, of a yellowish brown. It resembles in fact calcareous sinter. The temperature of the water is sufficiently great to enable the pilgrims who annually resort there to cook their rice in it, doing which is considered a holy act, though not so much so as bathing in it, for which purpose some of the water is collected in a tank and covered over with a shed. The village of Mani-karu is without exception the most miserable of all I have ever seen. It consists of about twenty houses in a most wretched condition, and their inhabitants are squalid and poverty-stricken. They appear to do nothing but sit on their haunches on slabs of slate which being placed over a stream of hot water, keeps them warm. Thus huddled together they seem to spend their days in drowsy listlessness.\* Unable to proceed any further to the eastward I retraced my steps to Mundi-nuggur, and got over the Tiri pass just in time to escape being blocked in by a heavy fall of snow, which occurred shortly after.

44. The sloping flanks of the mountains are cultivated with an industry almost incredible wherever there is a sufficiency of soil. The fields on these slopes are generally long narrow strips of ground, which rise one above another in terraces to great elevations, and even up steep acclivities. Each terrace is raised above the one immediately below it from one to twelve feet, according to the abruptness of the slope. They are levelled with great care, and are watered by rills conducted from a distance, which is sometimes considerable. These generally flow into the highest and thence the water runs successively into each of the others. In many places the fields are carried to an extraordinary height, and there the effects of increasing elevation upon the temperature and upon the crops are strikingly observable in the diversity of tints the produce assumes. The highest is in fresh blade, and brilliantly green, while the lowest is sere and ripe. These effects of aspect and elevation upon the cultivation are often very remarkable, for, while on the uplands

\* Mani-karu is probably about 4,800 feet above the sea.

the produce is green, it has been reaped and carried at the base of the valley! Perhaps these are nowhere so extraordinarily exemplified as in the Kangra valley, where, on the Chumba range, the vegetation of temperate regions predominates, whilst but 3,000 feet lower in the valley the majority of the fruits and vegetables belong to the tropical. The hamlets in Kooloo seldom contain more than from fifteen to twenty houses, but generally not so many. Single houses are numerous, and, from their being scattered amongst the fields, give an agreeable variety to the bold landscape. This distribution of houses arises, however, more from necessity than choice, because the lands available for cultivation are usually of small extent and widely separated, and consequently could not support large communities. It is also imperatively necessary for the husbandman not to place a ravine or any other impediment between his hut and his fields, as all communication with them would probably be cut off during the greater part of the rains which, as everybody knows, is an important season of the year in India. The case is somewhat altered, however, on the left bank of the Parba, where there is more than the usual quantity of arable land, and consequently the villages are large, thriving, and numerous. On the right bank of that river the slope is much more precipitous and has been left in consequence almost entirely unoccupied.\* In those districts near Simla which border on the plains the dwellings have flat mud roofs, but here where snow falls in winter the houses have pent roofs, which are covered with slabs of either sandstone or clay-slate. Wood is seldom, if ever, employed, and very little attention is paid to the splitting of the slabs, which consequently are of every size, and thickness. From that circumstance the majority of the scattered huts have a very untidy appearance. They are generally two-storied, the lower being invariably used for cattle and the upper occupied by the family. The upper one is generally surrounded by a low covered gallery, in which the inhabitants usually sit when at leisure. Some of the houses, however, are nothing less than four-storied, quadrangular towers. Their average height is about twenty-five feet, each story being seldom more than five feet high and ten feet square. Many of these larger houses and all the temples, have

\* This prosperous portion of Kulu lies within the jaghir belonging to the petty Rajah of Sultanpore; whose ancestor possessed the whole of Kulu until deposed by the Sikhs.



roofs after the Chinese fashion, which gives them a singular but pleasing appearance. The pitch of these roofs is great, being formed of either two or four concave surfaces joined at the summit and diverging down to the walls, where they project horizontally three or four feet into eaves. The walls are generally built of wood and stone without any cement, and they look substantial. Between every two or three feet of stone is placed a thick plank of fir, and thus stone and wood are employed in all their domestic buildings. There are a couple of temples on the left bank of the Parba built entirely of wood of the cedar (Keloo). They are elaborately carved and stand upon square platforms of stone raised three feet above the ground. Their roofs are pyramidal and project beyond the walls, like those of Chinese buildings. All around the edges or eaves are suspended wooden drops neatly carved and so loosely hung that they rattle in every breeze. Their interiors as well as exteriors are also richly carved and decorated with figures of deities.

45. The natives of Sookeyt, Mundee, and Kooloo, have sallow complexions and appear to be the same race of men as the inhabitants of Bushair. In fact many of the coolies employed in carrying baggage between Simla and Kalka are men from these states, who are attracted there by the very extravagant rate of wages, which average one anna a day in their own districts, but from four to six annas on the left bank of the Sutlej. The men are generally tall and strong, but few of them are handsome. Many of the young women are pretty, but at the age of 20 or 25 become coarse and stout. The dress of both sexes is nearly the same. It consists of a drab-colored woollen frock, trowsers of the same, or of leather, and a flat skull cap, generally black, with sandals made of coarse grass. The woollen cloth called "puttoo" is manufactured by themselves and resembles thick coarse blanketing. It is sold in pieces of 10 inches in width and about 21 feet in length at 2 Rs. 8 as. or 3 Rs. a piece, according to the quality. Both sexes wear a girdle around the waist, and the men generally go bare-legged during the hot weather. They seldom if ever, wear shoes, the richer classes however wear worsted stockings and shoes when they go out. The women instead of the cap sometimes have a colored piece of cloth tied round the head, and occasionally twist their hair into one long plait, the end of which is then ornamented with slips of colored cloth or shreds of worsted. The plait is by no means unbecoming to the young. The



dress of the women on the western side of the Seukundir range consists on the contrary of a tightly fitting body and sleeves with a full petticoat having a broad border at the bottom. Their favorite color is a light yellowish chocolate, whilst the border is generally of a deep blue or of some other dark color. A veil is thrown over the head and shoulders, as in the plains. If they meet an European they stop and turn their backs to him until he has passed, a custom which always reminded me of the ostrich. The men dress pretty much in the same manner as those on the plains. Like all Asiatics, the women of Kulu and the adjoining states are inordinately fond of ornaments, which are of the usual description, with the exception of mother o'pearl amulets, which none are without, not even the males. The amulets consist of small thin plates of mother o'pearl of various sizes and engraved with mystical figures. Several of these are slung around the neck and hang conspicuously on the chest. I believe polyandry is unknown amongst them, nor are they guilty of infanticide, but polygamy is general. Travelling is generally performed in jaunpauns by those who can afford it. The jaunpaun is like a large tea tray with a pair of bamboo shafts behind as well as in front. I cannot say I admire this kind of vehicle, for one is either toppling over in front or slipping out behind, or falling headlong over the side into the Khud, to say nothing of the difficulty of packing one's legs, &c. &c. The ladies have theirs covered over with a scarlet cloth. All agricultural labors, with the exception of ploughing, are performed by the females, while the men too commonly sit idling at home, but such indeed is the state of the weaker sex in all uncivilized communities; the corn is cut with the sickle, and burdens are usually carried in kiltas or large conical baskets over the shoulders on to the back, the general mode of carrying loads in the Himalaya mountains. The mountaineers of those parts have long been much in the habit of ill-treating their wives, and since the introduction of our laws the desertion of their husbands by the women has been pretty general. The men of Kulu laid their grievances before the proper authority, by whom they were told that since, before the British rule, they valued their cattle more than their wives, they must now reverse the custom, and take greater care of their wives, a system of valuation they evidently could not appreciate, as wives were more plentiful than cattle.

46. About Subathoo one sometimes sees infants wrapped up like little

mummies and laid in such a position that a small rill of water falls on their heads. These infants are usually watched by some elderly female apparently their great-grandmother, whilst their mothers are employed in the fields. The natives believe that this ordeal strengthens the children and renders them hardy, and that it cures dysentery and various other diseases. But the common object is I believe to keep them asleep, and that this is found to be the most effectual means of doing so. I could never ascertain whether the inhabitants of the mountainous district on the right bank of the Sutlej adopted this plan or not, but should think it most likely that they did. The chief wealth of the people consists in cattle, a small horned kind, sheep and goat's, with occasionally a few buffaloes. The rest of their subsistence depend upon their crops. The majority are intelligent, often shrewd and very inquisitive, but with all this in their favor they are frightfully superstitious. In fact it is almost impossible to believe that human beings could be such idiotic dupes as those poor simpletons undoubtedly are. They have great dread of the "evil eye," and are constantly having recourse to the magic art of witch finders, who feign the power of discovering all evil spirits which wander over the mountains in the tangible form of witches. If a cow or any other living creature dies its death is immediately attributed to some "evil eye," and a witch finder is employed to discover it. This impostor having selected some old woman who has no means of propitiating him by gifts, places his victim in the centre of a group, whilst all who are interested in the case sit around her in a circle. He then commences dancing round the poor creature, and ultimately nods his head towards her, whereupon all the lookers-on do the same, which coincidence is deemed an all-sufficient proof of the poor woman's guilt. She is subsequently condemned to be burnt to death! But since that district became a British Province these inhuman proceedings have not been allowed to take place, but another method almost as cruel has been substituted in its stead. In this case they declare the victim of their superstitious credulity an outcast, and refuse her the commonest necessities of life, thus she is abandoned to her fate, and would probably starve to death but for the timely gift of a goat or a sheep by some one of her relatives to the witch-finder, who forthwith fastens the guilt on some other person in hope of extorting in a similar manner from the relatives of the last accused. In this way these im-

postors, aided by the credulity of the people, thrive, and though some might wish to have them expelled from their villages, fear of the power of these miscreants to call the wrath of their gods upon them, prevents it. However, the apprehension and punishment of some of these rascals have lately done much towards dispelling the implicit faith put in their supernatural powers, and the people begin to think that the evil spirits are afraid of the English, and consequently obey them! Now it appears to me that education, and that alone, would open the eyes of the people to these monstrous absurdities. Moreover, that it would be folly attempting to convert them to Christianity until their faith in such things was first shaken by the mild influence of education. I will venture to make some additional remarks on this subject in an Appendix.\*

47. The inhabitants of the Chumba range appear to be a different race of men. They are shorter and appear much stronger, and are certainly cleaner about their persons. They call themselves Rajpoots, and say they belong to the Guddee jat, which is the coolie caste, I believe. They are a sharp set of fellows and are consequently able to impose upon their less knowing neighbours. Most of the witch-finders are Chumba guddees, which says a good deal for their craftiness. When Europeans made their first appearance in the Kangra valley these men had very slight notions of caste and would eat or drink any thing the former gave them, whereas now since their contact with the natives of the plains, they have become as bigotted as any Hindu, and moreover have learnt the art of cheating Europeans in great perfection. The Chumba guddees may always be known by their peculiar conical caps, with lappets to turn down over the ears like an English travelling cap. As we proceed from the plains into the interior it is very interesting to remark the gradual change in the features, from the Hindoostanee to the Tartar-like countenance of the Lahoulees. These last are a totally distinct race from any of the former. The Lahoulees are a short sturdy set of men, very ugly and filthily dirty. The women are decidedly plain. The costume of both sexes consists of a pair of loose woollen drawers, with a frock of the same material, whilst a wrapper is also often wound around the body by being thrown over the shoulders and fastened by a brass clasp in front. Their dress is generally of a black color or a kind of plaid, and their caps are of the same. The women wear their hair

\* Vide Appendix D.

either in long plaits fastened at the back of the head with a profusion of red wool and coloured shreds, or comb it back off the forehead, tying it in a lump behind, and adorning it in a similar manner. Around the flat circular caps are strong large white shells like cowries, glass beads, and pieces of amber. Around their necks both men and women wear amulets of mother o'pearl, pieces of amber, turquoises and other precious stones. Each man has hanging to his belt, a tinder pouch and a brass instrument for striking fire, with many other nondescript implements. They spend 6 months of each year in Kulu on account of the severity of the winter season in Lahoul. The greater part of that time they pass in dancing and drinking. On their jubilees they set off fireworks and make a tremendous noise, whilst the women dance. These exhibitions do not terminate until they are all too drunk to continue them. All the mountaineers are fond of spirituous liquors, especially of brandy, but I believe do not often drink it to excess. By special invitation I went to witness the commencement of one of their orgies; I never laughed more heartily than at the grotesque figures I saw around me on that occasion. The women were most ridiculously decked out, especially the aged dames, who appeared to me as the very personification of witches! Many of the young damsels had beautiful eyes, of which they made the utmost use by staring at the stranger. Their characteristic costume, their long cues of hair, and felt caps stuck coquettishly on one side, and the peculiar bunchy knot peeping out behind, to say nothing of the ornaments, produced a most ludicrous effect, whilst they shuffled and wriggled their bodies about in the dance. The men were all this while either quietly looking on or beating tom-toms and other indescribable instruments, with which they succeeded in making a most disagreeable noise. I cannot say whether such a tamasha prevails on ordinary occasions.

48. There are two routes from Mundi Nuggur to Shujanpoor, passing by Drung,\* the first follows the course of the Beas until it escapes through the Sekunder range.† The road then turns off to the right or

\* In my report on the Kohistan of the Jullundhur, I most unaccountably placed Drung on the eastern flank of the Gogar range, whereas it is situated on the western.

† Whether the Sekunder range has been named after Sekunder Lodi of Delhi, or Alexander the Great, I am unable to decide, but am inclined to coincide with the former opinion. I made every enquiry after the altars built by the latter, but obtained no clue.



northward, and passing over the last named range, arrives at Gunha, whence going through Hara-bagh, Beijonath and Jeysingpoor, reaches Shujanpoor Tira, the road between the ghat over the Sekunder range and Beijonath passes through a rugged mountainous country, where it alternatively ascends and descends, and is generally bad. Gunha and Beijonath are two villages, the former is built on the slope of a mountain and near some salt mines, whilst the latter is a still more miserable place. By this route it is six marches, and by the other *viâ* Kumleh-gurh, five to Shujanpoor.

49. From Mundi-nuggur to Sekund is about 12 miles. We commenced the march by ascending about 1000 feet to the top of the range in the rear, or to the west of the town. The road then wound round along the table summit of the hills to the north-westward for several miles, and at last gradually descending brought us to a knoll at the foot of the Jinneytree ghat. About half way we obtained a fine view of the Bul Dhoon and Sookeyt; I was not a little surprised at finding a species of palm, the mango, and the peepul growing on the heights above Mundi-nuggur, which is 2637 feet above the sea. I saw a species of oak and the rhododendron growing much lower. There is to be seen an immense deal of cultivation on either side, and but few villages and woods, excepting on the highest ridge; the march nevertheless was a delightful one, for we were surrounded with delightful scenery of a wild and romantic character.

50. On leaving the hamlet of Sekund we commenced the ascent of the highest ridge of the Sekunder-ke-dhar. The first part of our route up to the summit of the Jinneytree (or Janitri) pass was through a beautiful forest of oaks and rhododendrons, many of the latter being in full blossom. It put me in mind of Simla, but the site has many advantages over that of the latter sanatorium. Its proximity to the Chumba range and the snowy peaks of Kulu, with fertile valleys below, are no slight recommendations. The view besides, from the Janitri ghat far surpasses that from Jacko. However at first sight it does not appear so accessible as Simla, but I suspect a road could be made along the upper part of the range as far as the Sutlej opposite Bilaspoor, whence to Roopur a good road already exists. I have before attempted to describe the view obtained from the ghat\* and therefore need not do

\* See report on the Kohistan of the Jullundhur.

so here. There are some persons whose dispositions are so contented, and whose wishes are so limited that they are happy in the performance of the daily duties which their situations impose upon them ; satisfied with the spot where their destiny has fixed them they never allow their minds to be disturbed by sighing for a change, and are willing to remain in one place for the whole period of their lives. What a different disposition is mine. Restless and uncomfortable when obliged to be stationary, I am forever longing to visit the least frequented recesses of the earth, or to sail over the boundless ocean in search of some unknown shore. Nothing is so gratifying or so refreshing to my feelings as motion, and whilst my love of wandering often urges me to travel over untrodden paths, I have felt that my mind could never weary of exploring the wonders and admiring the beauties of nature. Often have I gazed on the solemn death-like majesty of the Himalayan range, the outlines of whose summits covered with eternal snow are so beautifully developed by the cloudless azure of an Indian sky, and as often whilst thus silently gazing on those mysterious works of nature a thrilling awe has involuntarily crept over me and filled my mind with delightful melancholy.

At this point the western face of the Sekunder range is very barren and steep. This abruptness and sterility are caused by the strata dipping to the east and out-cropping to the west. It is a general observation that the south-west and west aspects of mountain ranges are precipitous and rugged, while their opposite faces slope less rapidly and spread over a greater extent of country. These characters are peculiarly striking throughout the various ramifications of the Himalaya, and nowhere more remarkable than in the Sekunder range. With the exception of a few stunted oaks and rhododendrons which we met with during our descent of the first 500 feet, and here and there a peepul planted at the turns of the road, we saw no others until we got into the less exposed dells, where mangoe and other forest trees were growing luxuriantly. When we arrived at the bottom of the Soane khud we halted at Dhurrumpoor, a village completely hidden by trees. The Soane is a small stream which empties itself into the Beas, and is nearly dry for the greater part of the year. This last march is about 10 miles long but it is very fatiguing. The ascent from Dhurrumpoor to the Janitri ghat must be very trying, as the descent is tiresome enough.

51. On the following day, the 26th January 1848, we marched up the Soane khud for about a mile and then turned to the right up another and very tortuous ravine. This led us to the foot of that remarkable ridge on which Kumleh-gurh stands. The Soane khud is prettily wooded with bamboo, the mango, and the silk cotton tree (*Bombax heptaphylla*) but the hills generally are very barren, and are covered with coarse grass. The sections exhibited an indurated and calcareous conglomerate interstratified with coarse sandstone, and occasionally lignite in the shape of trees. Kumleh-gurh is built on a long narrow ridge of the same materials running nearly due north and south, and throwing out spurs in various directions. Between the spurs its slopes are very precipitous, and often perpendicular. Its summit is also deeply serrated, and on these somewhat isolated peaks are situated the fortifications, insignificant in themselves, but strong by position. It is approached by good paths from the east and west, which unite within a quarter of a mile of the gateway, and terminate within a hundred feet of the same. This is succeeded by a rude flight of stone steps and a moveable wooden ladder which completes the ascent. The gateway is built in a serrature between two peaks. The entrance is effected through a common door-way leading into a dark winding passage. After this come a few more steps, and then a quadrangle, which would probably hold about 500 men. The apartments are arranged along the sides. Passing through the quadrangle, we came upon an excellent flight of steps which led us to the top of the highest point, on which is a Hindu temple. The view from that is very fine. The Chumba and Sekunder ranges, the palace of Tira and the hill of Asapooree, with the fertile pergunnah of Jeysingpore and the silvery Beas at its feet, form scenery of a most varied and romantic character. On the points adjoining the temple are other small buildings capable of holding a few men each. Some of them however, have been lately pulled down by order of the Mundi Raja, as they entailed too great an expenditure. When Lord Hardinge visited Kumleh-gurh he compared it to Gibraltar, which he must have meant as a mere compliment, for had His Lordship really thought so, he would not have made it over to the Raja of Mundi. The Sheiks evidently considered it an important position and kept a strong garrison there. It labours, however, under the usual disadvantage—a scarcity of water. If I recollect rightly the only water near at hand is



procured from a stagnant pool near the gateway. Sinking wells in the hard conglomerate rock would be fruitless, so the evil cannot be remedied. In the details given of the place I may possibly err a little, as I did not like to pull out my note book and make notes on the spot, I preferred trusting to my memory and committing the result to paper on my arrival in camp.\* Leaving Kumleh-gurh we descended by the western path into the stony bed of a ravine, which we followed for a short distance, and having ascended some rising ground entered a fertile and picturesque valley. After the cheerless and desolate hills we had just traversed, such a sight was indeed delightful, the pleasure moreover was greatly enhanced from its not having been anticipated. We were ignorant of the existence of such a lovely spot until we met with it. We viewed it moreover under very favorable circumstances. All the fields were sown with grain, and the wheat was just springing up under the influence of some seasonable showers and a genial sun. On the left bank of the Beas the terraced slopes, gradually decreasing in height, are blended with the fields which skirt the river. On the opposite side are the fertile pergunnahs of Raj-ghirri and Jeysingpoor, separated by low wooded hills from the elevated plains which slope up to the Chumba range. Throughout its whole extent the valley is studded with populous villages and wooded hamlets, and its fields with picturesque groups of bamboo, mango, or silk-cotton trees. Here and there also a solitary palm rears its graceful crest regardless of the chilling blasts which descend from the adjacent snows. Through this charming vale the Beas also winds its way and presents a glassy surface, broken every now and then by gentle falls, down which its waters roll in mimic cataracts. It must be confessed however that the wide sandy bed of the river detracts somewhat from the general beauty of the scenery. Unfortunately all Indian river scenery lies under the same disadvantage, excepting those in the Province of Bengal. In the hills the river beds are usually covered with boulders, bleached by the sun, and in the plains (at least in the North-Western Provinces) with fine white sand. This must always be the case wherever rivers periodically extend the limits of their beds. Having performed a march of 15 miles or more, and moreover, having been on our legs from sunrise until sunset, we were glad to reach

\* Mr. Moorcroft's description of the place is quite unaccountable; he must have received it from interested parties.



our encampment at the little village of Sunghole, which is pleasantly situated near the river, and in the valley above mentioned. The Bar-kur Khud throughout its whole length forms I believe the boundary between the British and the Mundi Raja's territories. A part of the picturesque valley above described, and which I propose calling the Sunghole Dhoon belongs to the latter.

52. The march to Shujanpoor is about 9 miles in length. The usual route lies along the left bank of the Beas, but we crossed it about a mile below Sunghole, and passed over into Jeysingpoor, a part of which belongs to the Meer of Raj-ghirri. He is a natural son of Futteh Chund the traitor.\* The pergunnah of Jeysingpoor is very level (at least that portion of it which I saw) and contains many thriving villages situated amidst luxuriant fields and shady copses. The adjoining pergunnah is that of Raj-ghirri, which appears almost as fertile. We passed by the ruinous palace of Bijapoor and the cemetery of the rajas of Cotoche; I did not remark any thing worthy of notice about the tombs or saw any inscriptions on them, but I am no antiquary, nor have I any partiality for antediluvian fragments or for pillaging vespertillian abodes. Roodur Chund, the Meer of Raj-ghirri, has a jaghir which produces him an annual income of about 35,000 Co.'s Rs. He is an old man possessing the usual amount, or rather deficiency of intellect, which most native princes rejoice in. His residence is not worthy of description, although it is prettily situated on the right bank of the river and in the Sunghole Dhoon.

53. The position of Shujanpoor Tira is difficult to describe. Any person reading the account of that place in the Gazetteer of the countries adjacent to the North-Western Provinces would imagine that it stands on a hill or some rising ground, whereas its situation is just the reverse, or down in a dell! It is built on the north-eastern half of a level plain some 5 or 600 acres in extent, lying on the left bank of the Beas, and enclosed on three sides by low, naked hills. The fourth or north-eastern front opens into that part of the Kangra valley which I have called the Sunghole Dhoon. It consequently enjoys a magnificent prospect of the Chumba range† and the low wooded hills in the rear of

\* For this man's history vide Moorcroft's travels.

† The Chumba range, so often mentioned in this journal, is visible from the summit of Jacko at Simla, from N. 30° west to N. 70° E. Also from Koteghur, from N. 8° E. to N. 28° east.

Raj-ghirri, with Assa-pooree and others. The Beas flows in a wide channel about 100 feet below the plain, and escaping through the gap in the Chungur-ke-dhar enters the Joala valley near Nadoun. The town is large and populous, containing about 5000 inhabitants. In the centre is a large quadrangular space covered with turf, and called, I believe, a "chaugan." There Sansar Chund and his courtiers were in the habit of playing the game known as "hockey on horseback." The whole town is completely overgrown by trees, scarcely a single house being visible from a short distance. It covers but half of the plain. What a splendid parade ground the remainder would form! What a delightful situation for a Military station! the neglected portion of the plain would form a parade ground sufficiently large for three or four regiments, and the level summits of the surrounding heights would afford any localities for barracks and houses. The plain is elevated 2470 feet above the sea, and the climate is agreeable, snow occasionally falling during the winter, whilst hot winds, or sand storms rarely sweep over the place. The palace of Tira is in a dilapidated state, and is situated on the hills overlooking the town, and about 300 feet above it. On the same side to the eastward, but two miles distant, stands a fort which appeared to be going to decay, but I did not visit it. On the opposite side of the river to the north-east is the garden of Alempore, where our countryman Moorcroft was received by the Raja of Tira, and ex-Raja of Cotoch. Those pleasure grounds are now to be converted into a tea garden. The Government made over to the present representative of Sansar Chund the useless place without the garden of Alempore, thus depriving the gift of all appearance of disinterested generosity. I must here notice the custom of writing the names of adjacent towns, villages, or places of note whenever they are mentioned, thus the palace and town are always spoken of as Shujanpoor Tira; again the Bul Dhoon is called Sookeyt Mundi; also Kangra, Bhawun; and Pallam, Puttiar, &c. are commonly used.

54. We left Shujanpoor on the 4th February, having been delayed there by the weather, which had been very changeable. Sharp frosts were succeeded by snow, or sleet by torrents of rain, and violent gusts of wind, accompanied by thunder and lightning. How thrilling it is to behold the mountains when dark clouds are rolling along their steep flanks and the vivid lightning is playing on their peaks, and whilst the

loud thunder reverbrates against their sides the sound is re-echoed through every glen. But how different is the sensation when the tumultuous roar of the elements has been succeeded by death-like stillness, and we behold the distant summits covered with fresh snow standing out in bold relief against the deep azure of an eastern sky. We marched on the day above mentioned to a small village called Thoorul, situated about seven miles north of Tira. The road runs parallel to the Joala range and passes through corn fields and pretty hamlets. Between the hill called Assa-pooree and the ridge which separates the pergunnahs of Kangra and Pallam, the valley consists of an extensive plain, which slopes downwards from the Chumba range. It is intersected by several torrents which flow along the bases of deep ravines.

55. About nine miles further on in a north-eastward direction we came upon the flourishing village of Bhurwurnah, which is but five miles distant from the base of the Chumba range and near the centre of the pergunnah of Pallam. We encamped within a large plot of ground which was being laid out for the cultivation of the tea plant. The road all the way is excellent and passes through a most delightful country. The numerous villages are adorned with a profusion of mangoe and silk-cotton trees and copses of bamboo. The rippling brook and the hedgerow on either side, with stately trees overhanging the road, gave quite an English aspect to the scenery, the similarity of which was not a little increased by the occurrence of patches of snow in the shady hollows. I noticed that the boulders buried in the alluvial strata, and of which sections are visible on both sides of the road, were in every stage of decomposition or disintegration. Some of them were so far gone as scarcely to be distinguishable from the clay in which they are embedded. In many instances merely the outlines shewing the original size and shape of the boulders are left. They had been originally blocks of quartz, granite, sienite, sandstone and various kinds of schist. In the clayslate composing the hill called Jacko at Simla I remarked similar outlines within which were invariably materials of a different nature to the hard clay with which they were surrounded. They puzzled me greatly at the time, as I was then unable to account for their presence, but I now feel convinced that they also must originally have been boulders, and that they have been decomposed since their deposition in the strata. It seems almost impossible to account for them on any



other supposition. The streams which flow from the Chumba range appear to have cut their way through many feet of strata, leaving flat terraces at different levels and at corresponding heights on both banks. The surfaces of these terraces are not horizontal but parallel to those of the streams, or the general inclination of the valley. Their formation can only be accounted for by supposing a rising of the land to have taken place at intervals, whilst the work of denudation has been going on incessantly. The upheavals, whether gradual or sudden, must have been intermittent, and long pauses have occurred between each, during which the streams had sufficient time to encroach upon their banks. If the above hypothesis be not adopted we must have recourse to another, which is not supported by analogy. We must suppose that when those rivers first began to flow their volumes of water were much greater than they are at present, and that they were from time to time suddenly decreased until they became as small as they are, a supposition totally unsupported by any similar facts, whereas the phenomena of the elevations and subsidencies of land are going on at the present day.

56. Although Kangra was but 14 miles distant, we preferred making two marches of it, and therefore halted at a large village called Nagrota, about nine miles from Bhurwarnah. The road is good, and passes over some low rounded ridges of sandstone and marls. The country is exceedingly pretty, but the whole valley of Kangra is the same. At Nagrota another Government garden was being laid out for the reception of the tea plant: the one at Bhawan had been sown, and the seeds had germinated before I left the district, in the beginning of April last. From what has been said of the geology of this district, the nature of the soils in the several valleys may be easily surmised. In the first place the soil of the Jaswun Dhoon is sandy, with an admixture of clay, mica, and lime, the summits of the two enclosing ranges are also sandy, and mixed up with a large proportion of gravel. The soil of the Joala valley on the other hand is composed of a marly clay, having sand mixed with it in variable proportions. But that of the Kangra valley is the most fertile, and is made up of the debris of the rocks composing the Chumba range, viz. granite, clay-slate, sandstone and marls. During my rambles through the hills I noticed the following kinds of crops, some of which I have not mentioned before, viz. sugarcane, rice, cotton, barley, wheat, tobacco, poppy, linseed, turmeric, ginger, potatoes, sunn,



molee, bajra, hemp, and the castor oil plant, besides the following fruit trees—walnut, pear, apple, cherry, plaintain, mango, mulberry, apricot, various kinds of oranges and lemons, grapes and figs, as well as several species of the bair and the corinda (*carissa carandas*).

57. I am indebted to Captain A. Cunningham for the following elevations. They are to be taken as approximations, which may be 100 feet either more or less than the truth.

Adinanagur, .....	1200 feet.
Pathankot, .....	1200
Noorpoor, .....	1665
Kotila, .....	1370
Kangra, .....	2647
Joala Mukhi, .....	1805
Tira, .....	2470
Mundi, .....	2637
Sultanpoor, .....	4584
Hoshiarpoor, .....	1200
Kumleh-gurh, .....	4258
Nari Ghaut, .....	2009
Rajpoor ditto, .....	2500
Sekunder ditto, .....	5430
Jaintri ditto, .....	5632
Gogar Pass, .....	4900
Tiri ditto, .....	6484

The following particulars of two storms which occurred at Kangra in 1847, may not prove uninteresting. On the afternoon of the 24th January, the weather set in wet and continued so until the evening of the 29th. We had a smart fall of hail on the 27th, and a severe storm on the 29th. The annexed are the variations of one of Fahrenheit's thermometers observed during the storm. The thermometer was suspended three feet above the ground in an exposed position.

20 minutes before storm, .....	48°
Commencement, .....	43
Middle, .....	33
End, .....	33
$\frac{1}{4}$ an hour after, .....	38
1 hour after, .....	39
9 o'clock, P. M., .....	37

It commenced at  $\frac{1}{2}$  past 4 o'clock, P. M. and lasted  $11\frac{1}{2}$  minutes. When the storm was directly overhead 3 and sometimes 2 seconds only elapsed between the lightning and the thunder. The hailstones were very large and looked like small balls of snow. The greater part remained on the ground a full hour after the clouds had cleared away. The clouds travelled from east to west. On the morning of the 30th at a quarter of an hour after sunrise the thermometer stood as low as  $33^{\circ}$ , and here and there were still to be seen masses of hailstones. On the morning of the 2nd of February, snow fell for two hours and 20 minutes. It covered the whole valley of Kangra as far as the Joala range. The thermometer stood on that day as follows :—

At $8\frac{1}{2}$	A. M.	(clouded and commenced snowing,) . . .	$36^{\circ}$
„ 9	„	still clouded, . . . . .	35
„ 10	„	ditto ditto, . . . . .	37
„ 11	„	a few minutes of sunshine, . . . . .	38
„ $11\frac{1}{4}$	„	ceased snowing (clouded,) . . . . .	39
„ 12	„	clouded, . . . . .	41
„ 1	P. M.	ditto, . . . . .	41
„ $1\frac{1}{2}$	„	ditto, . . . . .	49
„ $2\frac{1}{2}$	„	ditto, . . . . .	47
„ 3	„	ditto, . . . . .	46
„ $3\frac{1}{2}$	„	ditto, . . . . .	44
„ 4	„	ditto, . . . . .	43
„ $5\frac{1}{2}$	„	ditto, . . . . .	42
„ 6	„	ditto, . . . . .	41
„ 7	„	ditto, . . . . .	40
„ 8	„	ditto, . . . . .	39

From the above it will be seen that the thermometer indicated a greater intensity of cold during the hailstorm.

Kangra is situated in latitude  $31^{\circ} 57'$ ; Longitude  $76^{\circ} 4'$ \*

On the following morning an hour after sunrise my thermometer was standing at the freezing point! The ground was covered with hoar frost and the snowy range appeared in all its glory, free from clouds and mist, and glittering with ineffable brightness. No pen could have described the sublimity of the Chumba range as it then appeared clothed from head to foot with its chilly mantle.

\* Vide Thornton's Gazetteer.

## MISCELLANEOUS.

*A Notice of a very remarkable local deviation of the Compass near Saugor in Bundelcund, communicated by Captain J. H. CAMPBELL, B. A.—By HENRY PIDDINGTON.*

In November last I received from Captain J. H. Campbell, B. A. Commissary of Ordnance at Saugor in Bundelcund, a letter of which the following is an extract:—

“A friend of mine was lately surveying the line of road from this northward to Heerapore, when the following strange incident took place, and which I give you in his own words.

“I send you the account of the magnetic attraction. I observed on the banks of a nullah close to the village of Sarraroo,  $33\frac{1}{2}$  miles hence on the Nowgong road. The instrument I used was a Prismatic Surveying Compass,  $3\frac{1}{2}$  inches in diameter, and the disk divided into twice  $180^\circ$ . I was surveying the road, and found on arriving at station “b” on the banks of a stony nullah, that the back bearing to station “a” was  $165^\circ$ , S. E.; thinking that this was an error I placed the instrument at station “a” and found the bearing of “b” to be  $60^\circ$  N. E. of a Peepul tree on the right of the road  $71^\circ 40'$  N. E., and of the sun (which had risen about  $\frac{1}{2}$  an hour)  $105^\circ$  S. E.; I then measured to the Peepul tree 68 yards, and planting the instrument there found the bearing, of station “b”  $58^\circ$  N. E., and of the sun  $106^\circ 40'$  S. E. After this I returned to “b” and found the bearing to “a”  $165^\circ$  S. E., the Peepul Tree  $163^\circ 30'$  S. E., and to the sun  $35^\circ$  N. E. I next passed 232 yards beyond station “b” and placing my compass in exact *alignement* with flags “a” and “b,” found the back bearing to “a” to be  $60^\circ$  S. W., thus proving that the forward bearing from “a” to “b” was perfectly correct, and that there must be some magnetic attraction at station “b.” On returning to “b” I found the forward bearing to “c” was  $177^\circ$  N. W., whereas at “c” the bearing of “b” was  $72^\circ 30'$  S. W. This was on the 20th of October last month. On my returning on the 23d October, I tried many experiments, and found that the attraction was confined to the spot “b,” as 10 paces from it all round the needle was not affected.”

Such is this officer's account of this strange occurrence. At his request I tried some experiments in the Magazine here, near piles of shot and shells, to see if iron alone could affect the needle to such a degree; I took one of the same sort of Prismatic Compasses which I have in store in the Magazine, and applied it in the same manner as the above officer did in his experiments, and on placing the instrument near a small pile of 6lb shot found the attraction to be  $2^\circ$ , and near a large pile of 24 pr. shot it was  $6^\circ$ , I tried this two or three times, but never

found it to exceed the latter. Thus apparently shewing that iron alone could hardly have been the cause of the attraction at 'Sarraroo.' I may as well mention that the above officer has been surveying for some years, and has had his compass in use for 5 years, and never found it play such tricks before. All that part of the country is famous for iron ore, and a great deal of it is smelted by the natives not very far from Sarraroo, though not at that place."

It was evident from this that at the station "b" a deviation of some  $105^{\circ}$  was occasioned by some hidden cause, and in reply to Captain Campbell, after quoting to him the well known instances of deviation occasioned by basaltic rocks, and that of Captain W. F. W. Owen in Canada, who found a difference of  $5^{\circ}$  to  $22^{\circ}$  in bearings taken on different sides of his own house,\* I suggested that by digging at the spot a mass or vein of magnetic iron ore, or even a meteorite (of which I had some hopes I confess) might be found. In his reply to me in March last he states that they *had* dug and found at a depth of about 5 feet a highly magnetic stone in large masses, occupying a space of about 10 feet square, and in return for some specimens which he required from the Museum of Economic Geology for the public service, he was good enough to forward me a specimen of it by banghy, which is now exhibited to the meeting. Upon examination it proves to be simply a Diorite† with a strong admixture of magnetic iron ore, giving it distinct polarity, but yet not enabling it to attract even small filings; and with numbers of minute amygdaloidal semi-crystallised grains of the melanite variety of Garnet interspersed in its substance. Its coating is of the usual ferruginous earthy kind, seen on common iron ore and basalts; and Captain Campbell informs me that the earth about it was much of this kind; I suppose a ferruginous loam or gravel. He adds that none of the basalts found in the neighbourhood are magnetic, nor are there any rocks of this kind in the vicinity.

I have carefully examined it for Nickel and Chromium, but it affords no trace of them, and is thus purely and simply a highly magnetic Diorite.

But we have here the remarkable geological fact of a considerable boulder of a very remarkable rock buried in the alluvium (or diluvium) of probably a distant district, and discovered by a very singular hazard; and it may thus become of high interest, when its parent rock or vein shall be found, to trace the road by which it must have travelled to its present position; for the rock is sufficiently remarkable not to be passed over even as a mere geological specimen, independent of its extraordinary magnetic powers, and I have thus deemed it well worthy of permanent record.

\* Naut. Mag. 1840, p. 293.

† A mineral composed of Felspar and Hornblende.



*Further remarks on the Ball Coal of the Burdwan mines. By HENRY PIDDINGTON, Curator Museum of Economic Geology.*

Mr. Homfray having at my request furnished us with a block of the coal from the seams of which the ball coal is taken, I have examined it very carefully and the following are my results.

*Description.*

The block of coal averages about 10 inches by 9, and is somewhat more than 6 inches thick, so that it may be, in round numbers, about the third of a cubic foot.

At the top and bottom of the seam the block has the usual soft, velvet-like coating of carbonaceous matter, with traces of fossil plants, so frequently found upon the seam sides of coal of all kinds, and in which impressions, more or less distinct, of vegetable forms are usually seen. The cross fracture however is difficult to describe. It is on one face tolerably vertical and perpendicular to the planes of the upper and under surfaces, like a block of English coal, but in the direction of the layers of alternate bright and dull coal of which it is composed, it is wavy, though not very deeply so. But upon the other three faces its structure and fracture can only be described by calling it a sort of flattened, globular concretionary one, having much the appearance of many softened globula, masses of coal pressed into flattened layers amongst layers of common coal, and where a lump is detached it assumes an irregularly elongated form, globular or bulging at the ends and sides, and flat above and below; appearing as if, when free from pressure, it had been of the rounded form of the balls of coal, and yet (and it is this which constitutes the difficulty of imagining any hypothesis to account for this kind of structure), the horizontal layers of dull and bright glance coal run through the globular and conchoidal projections and hollows of the compressed balls, as regularly as through the simply stratified or foliated parts. The only thing indeed one can liken it to geologically, would be a mass of gneiss just decomposing and separating into irregularly shaped globular or ovoidal concretions, as granite does into spherical ones, but preserving its stratification.\* We have one concretion detached from the mass about 4 ins. by  $2\frac{1}{2}$  and  $1\frac{1}{2}$  thick which is very distinctly a flattened and elongated ball, and it has left a hollow mould in the large mass where imbedded, yet it is distinctly formed of

\* Boase (*Primary Geology*, p. 114,) describes various kinds of conglomerated rock and of mica amongst others, but the nuclei of his instances are all different from the enveloping mass, but our balls are perfectly identical with it!

one large layer of bright coal and a number of dull ones with minute bright folia amongst them on both sides of the bright layer.

*Examination.*

The sp. gravity of a carefully chosen piece with part of a globular concretion attached is, .....	1. 26
It contains in 100 parts ; Hygrometric Water, .....	3. 90
Gaseous matter, .....	18. 90
Carbon,.....	61. 75
Ash, .....	16. 25
	<hr/>
	100. 80.

It will be seen that this makes it an inferior coal to the ball coal formerly analysed, but this is of little consequence, since it is not the quality of the coal, but its singular structure, which we are now investigating. I have been informed by Captain Powell of the P. and Or. Company's service, that in a steamer in which the coals were found to be on fire, but were extinguished, that the whole of the heated mass (of English Coal) was more or less softened, so that they were obliged rather to cut it like soft clay, so as to dig it out for throwing overboard ! If this was the effect of heating under the light pressure of a steamer's coal-bunker, we may readily suppose that a whole bed of coal may, when heated under the pressure in the mine, so far soften as upon gradual cooling to be at liberty to affect this semi-concretionary form, as so many half liquified bodies do, and as we see is shewn to be in granites and traps, when they decompose, their tendency also. But as we do not yet know how far this structure of the coal extends, and how it passes into the common laminary form and cubical fracture, we must suspend our judgment and our speculations as to what can have really given rise to this singular variety of coal. At present the few specimens we possess do not allow me to sacrifice any of the complete little shining nodules which may have an homogeneous structure, for examination.

PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL

FOR APRIL, 1849.

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The usual monthly meeting of the Asiatic Society was held at the Museum on Wednesday, the 4th April, 1849.

The HON'BLE SIR JAMES COLVILLE, President in the chair.

The proceedings of the March meeting were read, and the accounts and vouchers of the preceding month laid upon the table.

Letters were read from the following gentlemen, intimating their desire of withdrawing from the Society :—

W. GREY, Esq. C. S.

J. J. MACKENZIE, Esq.

J. KERR, Esq.

A. CHRISTOPHER, Esq.

DR. McRAE, a candidate for election at the April meeting, was proposed by Dr. Roer, seconded by Mr. Laidlay.

MR. WATTENBACH having returned from Europe and signified his wish to rejoin the Society, his name was restored to the list of members.

Read a letter from R. Thornton, Esq. Secretary to the Government of the N. W. P. conveying His Honor the Lieut. Governor's acknowledgments of the 200 extra copies of Lieut. Maisey's Antiquities of Kalingar, forwarded to him by the Society.

From W. Seton Karr, Esq. Under Secretary to the Government of Bengal, presenting for the use of the Museum of Economic Geology, a plan of the Fort of Monghyr, and of the lands adjacent to it.

From W. Grey, Esq. Under Secretary to the Government of India, conveying the thanks of the Hon'ble the President in Council for the copies of the map of the localities recently occupied by the British and Sikh armies, presented by the Society to the Court of Directors.

From Captain Newbold, forwarding a note on the strata cut through in excavating for coal in Wadi Sheraiet, by Hekekyan Bey.

From the Rev. Mr. Pratt, an additional note on the subject of Iron Tension Bridges, containing a reply to certain remarks upon his former paper by Major Goodwyn.

From Major Anderson, forwarding a memoir on the Geography of Western Affghanistan.

Read extracts from an interesting private letter from Captain Kittoe, detailing the progress of his present Archeological researches on the banks of the Gandak, and forwarding a beautiful and spirited sketch of the capital of the column at Mattia, surmounted by a lion.

From Captain Thuillier, the Meteorological Register for the month of March.

From Dr. Roer, the subjoined letter containing sundry propositions of the Oriental Section, which were approved and adopted by the Society.

TO DR. W. B. O'SHAUGHNESSY, Senior Secretary, Asiatic Society, Bengal.

*Dated Asiatic Society, the 5th March, 1849.*

SIR,—I have the honour to submit to you, for the approval of the Council and Society, the subjoined propositions of the Oriental Section with regard to the works next to be printed in the BIBLIOTHECA INDICA.

*Extract from a letter from G. H. BUSHBY, Esq., Secretary to Government of India, to DR. W. B. O'SHAUGHNESSY, Senior Secretary, Asiatic Society, No. 685, dated the 29th July, 1848:—*

3. With reference to the employment of their grant in the publication of the Vedas, you will be pleased to inform the Society, that the Honourable Court have sanctioned the printing of the Rig Veda in England. It will therefore not be necessary to undertake the publication of that work in Calcutta. *There are, however, other Vedas or portions of them, which it is desirable to preserve through the means of the press, and which may very properly become the objects of the Society's attention.*

2. The *Sanhitā* and *Brāmhana* of the black Yajur, accompanied with the commentary, being very extensive, the publication of the work, if undertaken by one individual, would be much delayed. *The Section therefore would recommend*

To entrust this work to two Editors, and to publish the *Sanhitā* and the *Brāmhana* at the same time, so as to print two numbers of the Journal every month. Bābū Rājendra has offered to undertake the edition of the *Brāmhana*, while the Secretary is willing to publish the *Sanhitā*.

3. As the edition of the *Bṛihad Aranyaka Upanishad* is nearly finished, and the *Kadamvari*, which, at the recommendation of the Section, the Society had resolved to print, has since been prepared for the press by a Pundit in Calcutta;



further, as the collection and collation of the MSS. of the Black Yajur cannot be completed in a time short of a year; and lastly, as the two works at present in the course of publication (viz. Dr. Sprenger's Arabic work, and the Kámanduki Niti Sástra) will not fill more than two numbers of the Journal, *the Section propose* the following works to be printed in the meantime :—

1. The Chandogya Upanishad, with the commentary of Mádhava A'charya, and Tika of A'nanda Giri (not published before.)

2. The Shiksha, one of the Vedángas, with the commentary of Mádhava A'charya. (There is a beautiful MS. of this work in the Library of the Society).

4. In consideration, that it is impossible for one individual to publish and at the same time to translate such voluminous works as those recommended for edition, and yet that a translation of them is of the highest importance for the usefulness of the Journal, *the Section beg to suggest*—

That the Society should offer for the translation of any work published in the Journal, a remuneration of Co.'s Rs. 1-8 per page, provided of course that the rendering has met with the approval of the Section.

I have the honour to be, Sir,

Your most Obedient Servant,

E. ROER,

Secretary Oriental Section Asiatic Society.

From the same, recommending, on the part of the Oriental Section, the purchase of some copies of Captain Latter's Burmese Grammar for distribution among the learned bodies with whom the Asiatic Society is in correspondence. The consideration of this subject was postponed to the May meeting.

From the Rev. Mr. Long, proposing a more active intercourse with the Orientalists of Holland.

A fine collection of copper ores from the mines of Burra burra, just received by Mr. Laidlay from Mr. Andrew Berry of Adelaide, as exhibited and presented to the Museum of Economic Geology.

For all the above communications and donations the thanks of the Society were voted, and the meeting adjourned.

J. W. COLVILLE, *President*.

J. W. LAIDLAY, *Secretary*.

#### LIBRARY.

The following books have been received since the last meeting :—

#### *Presented.*

Sárdakalpadruma, Vol. VI.—By RA'JA' RA'DHA'KANTA DEVA.

Bibliographical Index to the Historians of Muhammadan India.—By H. M. Elliot, Esq. C. S. Vol. I. Calcutta, 1849, 8vo.—By THE AUTHOR.

Catalogus Collegii Harvardiani seu Universitatis Cantabrigiensis, in Republica Massachusettensi. Cantabrigiæ: 1848.—By WILLIAM THADEUS HARRIS, Esq.

A Catalogue of the Officers and Students of the University at Cambridge for the Academical year 1847-48.—BY THE SAME.

A Catalogue of the Students of Law in Harvard University, 1848.—BY THE SAME.

The Oriental Baptist, No. 28.—BY THE EDITOR.

The Upadesaka, No. 28.—BY THE EDITOR.

The Calcutta Christian Observer, for April, 1849.—BY THE EDITORS.

Tatwabodhini Patricá, No. 68.—BY THE TATWABODHINI' SABHA'.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of February, 1849.—BY THE DEPUTY SURVEYOR GENERAL.

The Oriental Christian Spectator, for January and February, 1849.—BY THE EDITOR.

Journal of the Indian Archipelago, Vol. III. No. 2nd.—BY THE EDITOR.

Ditto ditto, (2 copies.)—BY THE GOVERNMENT OF BENGAL.

#### *Purchased.*

Comptes Rendus, Hebdomedaires des Seances de l'Academie des Sciences, Tome XXVII. Nos. 19—24.

Journal des Savants, Novembre, 1848.

The Annals and Magazine of Natural History, Nos. XII. XIII. N. S.

The Edinburgh Review, No. CLXXIX.

#### *Exchanged.*

The Athenæum, Nos. 1104—507.

Dur-ul-Muktar. On Muhammadan Law, 1 vol. 4to.

Tysir-ul-Osul. Ditto, 1 vol. 4to.

Risas-ul-Ambia. History of Muhammad, 1 vol. 4to.

Mekamat Hariri. On Rhetoric, 8vo.

Mohit Zwavete Dewáni. A Persian version of Marshman's "Civil Guide." 4to.

Bahar-ul-Jowahir. Dictionary of Medical terms, 4to.

Sharch Asbab. On Medicine, 4to.

Akhlák Hindi. Persian Translation of the Hitopodesha, 8vo.

Ujûzah. On Medicine, 8vo.

Tafsir Ahmody. A dissertation on Religion, 4to.

Ajal Ajab. On Rhetoric, 8vo.

Masnavi-e-Gulzár. A Poetical version of the Romance entitled Gulebakawali. Lucknow, 8vo : (lithographed.)

Tib-e-Nab-wi. A medical work containing prescriptions recommended by Muhamed. Lucknow, 8vo.

Sahrir-ush-Shahádatain. Chronicles of the Imams, Lucknow, 1847, 8vo.

Sir-ush-Shahádatain. Ditto, 8vo.

Fawáed-e-Samdiá. Persian Grammar, 8vo.

Hakikat-ul-Islam. A treatise on the moral and religious duties of the faithful, 8vo.

Saukiat-e-Kisrán. On Letter Writing, 8vo.

Naho Mir. Persian Syntax, 8vo.

Sáhihá Sháhi. On Letter Writing, 8vo.

Mozhab-e-Eshk. A Romance, 8vo.

Sharch Miat. Rules of Grammar, 8vo.

Rauzat-ul-Ahkám. On Muhammadan Law, 8vo.

Fawáed-ul-Awám. History of the Prophets, 8vo.

Gaet-ul-Bayán. Persian Grammar, 8vo.

Tozhiz Takhfím. On Muhammadan Ceremonies, 8vo.

Dewán Atash-e-Khaud. A Collection of Odes by Atesh, 8vo.

Sharch Mohemmani. On religious duties, 8vo.

Tekáhe Akbár. On Law, 8vo.

Masnavi-i-Mir Hassan. A Poem, 8vo.

Gulestán Mahusá. Gulestán with Commentary, 8vo.

Bostan Mahusá. Bostan with ditto, 8vo.

Majmu-us-Sanáni. A Collection of Letters, 8vo.

Kissa-e-Bahrám Gó. The History of Bahrám Gó. A Poem, 8vo.

Déwan Gáni. A Collection of Odes by Gáni, 8vo.

Rukká-át Lakshmináráyan. The Letters of Lakshmináráyana, 8vo.

Insha-e-Fuez Rasán. On Letter Writing, 8vo.

Rukká-át Mirza Be-dil. The Letters of Mirza Be-dil, 8vo.

Mehar-ul-Fasáhat. A Collection of Letters of Fasul-Akbári. On Law, 8vo.

Chahar Shariet. Select Rules on Letter Writing.

*Report of the Curator Museum of Economic Geology for the month of April.*

*Geology and Mineralogy.*—I have put into the form of a notice for the Journal the account of a very remarkable instance of an apparently isolated boulder of a highly magnetic Diorite which was discovered to be buried in the earth, at a surveying station near Saugor, Bundelcund, by an extraordinary deviation of the Compass. It is to Captain J. H. Campbell, B. A. Commissary of Ordnance, Saugor, that we are indebted for the information which first led to this discovery, and for the specimen of the mineral now exhibited.

Mr. J. Weaver has sent us a remarkably fine specimen of a shell conglomerate from Junk Ceylon Island.

*Museum of Economic Geology.*—Mr. J. Homfray has at my request sent us a specimen of the coal from the mine in which the Ball Coal is found, which upon examination proves to be itself a mass half composed of compressed yet regularly stratified balls, or something very like it. I have put into a paper for the Journal my examination of this coal, and trust soon to obtain a sufficient supply of the large and small balls for comparative experiment.

H. PIDDINGTON.



# Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of April, 1849.

Lat. 22° 33' 29". 33 N. Long. 88° 23' 42". 84 East. Mag. Variation 2° 28' 36" East. Mag. Dip. 27° 45'.

Days of the Month.	Observations made at sunrise.						Maximum Pressure observed at 9h. 50m.						Observations made at apparent noon.						Observations made at 2h. 40m.						Minimum Pressure observed at 4 p. m.						Observations made at sunset.						Maximum and Minimum Thermometer.			Rain Gauges.		Moon's phase. Days of the month.	
	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Maximum.	Mean.	Minimum.	Maximum.	Upper.	Elevations.							
		Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.								Of the Mercury.	Of the Air.	Of Wet Bulb.	Of the Mercury.	Of the Air.	Of Wet Bulb.		Of the Mercury.
1	29.676	78.9	79.9	77.3	S. W.	Cloudy.	29.729	87.3	87.9	78.2	S. W.	Clear.	29.699	93.9	93.8	73.9	W. N. W.	Clear.	29.641	97.9	97.0	73.0	W. N. W.	Clear.	29.624	98.2	96.2	71.7	W. N. W.	Clear.	29.624	93.0	91.7	73.6	S. E.	Clear.	98.8	89.2	79.6	119.4	..	..	1
2	750	78.8	79.3	77.3	E.	Ditto	823	86.8	87.0	79.3	S.	Cumulo strati.	791	91.9	91.3	77.7	N. N. E.	Cumulo strati.	711	95.2	93.3	80.0	E.	Cumulo strati.	697	95.2	93.4	80.4	S. S. E.	Cumulo strati.	722	89.4	88.2	79.3	S.	Cumuli.	96.3	87.9	79.4	114.2	..	..	2
3	823	78.5	78.6	77.2	E. S. E.	Clear.	874	88.0	86.2	79.0	S.	Ditto	846	93.5	91.8	79.5	S.	Ditto	751	94.7	92.8	73.6	S. S. W.	Ditto	735	91.4	90.0	78.0	S. S. W.	Cloudy.	785	86.8	85.8	74.9	S.	Cloudy.	95.3	87.1	78.8	111.2	..	..	3
4	863	68.9	68.8	65.3	S. E.	Ditto	935	84.0	82.0	72.4	N. E.	Clear.	888	89.9	89.2	76.3	S.	Cumuli.	793	92.8	92.0	76.7	S. S. E.	Cumuli.	769	92.0	89.7	76.2	S.	Cumulo strati.	797	86.8	85.8	75.3	S.	Cumulo strati.	93.8	81.5	69.2	111.2	..	..	4
5	862	75.2	75.4	73.9	S. E.	Cloudy.	906	85.3	84.0	77.6	S. S. W.	Cumulo strati.	855	90.4	90.0	77.7	S. W.	Cumulo strati.	773	93.3	91.9	77.6	S.	Cumulo strati.	..	..	..	..	..	..	773	85.8	85.6	75.9	S.	Ditto	93.8	84.4	75.0	107.3	..	..	5
6	830	77.0	77.7	74.0	S. S. E.	Cirro cumuli.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	
7	779	76.6	76.9	73.5	S. E.	Cloudy.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	7	
8	700	79.6	80.4	78.0	S. E.	Ditto	737	87.5	87.3	79.8	S. sharp.	Cumulo strati.	684	91.5	91.3	81.2	S. sharp.	Clear.	588	94.2	93.4	82.3	S.	Clear.	554	94.0	92.6	81.6	S.	Clear.	534	90.3	89.0	81.2	S.	Clear.	93.0	87.8	80.5	107.7	..	..	8
9	609	78.0	78.3	77.3	S.	Clear.	663	91.2	90.4	82.3	S. S. W.	Clear.	634	97.8	97.4	78.3	S. W.	Ditto	550	101.3	100.0	76.0	S.	Ditto	515	98.3	96.5	78.3	S. sharp.	Ditto	503	90.4	89.3	79.7	S.	Cirro cumuli.	102.2	90.4	78.6	115.5	..	..	9
10	..	..	..	..	..	..	718	96.4	96.3	80.0	S. S. W.	Ditto	718	96.4	96.3	80.0	S. S. W.	Ditto	672	100.9	99.0	81.0	S. W.	Ditto	658	99.2	97.6	81.5	S. S. W.	Ditto	670	91.8	90.5	78.8	S. S. W.	Ditto	101.9	90.7	79.4	114.2	..	..	10
11	758	79.8	80.3	77.5	E. S. E.	Clear.	823	90.6	89.4	78.9	S.	Clear.	780	96.8	95.5	73.3	W. N. W.	Ditto	697	100.2	98.7	72.0	W.	Clear.	673	100.0	98.0	71.2	S. W.	Clear.	659	94.6	91.7	76.4	W. S. W.	Clear.	101.6	91.0	80.4	122.0	..	..	11
12	735	78.2	78.7	75.9	S.	Ditto	775	91.8	91.4	74.4	S. S. W.	Ditto	729	99.0	98.2	70.0	S. W.	Ditto	651	101.7	100.7	70.4	S. W.	Ditto	621	99.4	97.7	73.9	S.	Ditto	627	91.7	90.8	74.8	S. S. W.	Ditto	103.0	91.0	78.9	120.4	..	..	12
13	690	78.5	78.8	76.8	S.	Ditto	727	89.8	89.5	80.4	S.	Ditto	684	95.7	95.3	82.8	S. W.	Ditto	598	95.7	94.9	82.4	S. W.	Ditto	568	95.9	94.9	80.1	S.	Ditto	581	89.0	87.8	80.8	S.	Ditto	97.9	88.5	79.0	109.8	..	..	13
14	653	78.9	80.0	77.8	S.	Cloudy.	717	90.8	89.7	81.3	S. S. W.	Cumuli.	684	95.0	94.8	83.0	S. S. W.	Ditto	619	96.7	95.3	82.5	S. S. W.	Ditto	599	96.1	94.3	81.3	S.	Ditto	580	88.8	87.8	79.8	S.	Ditto	98.0	88.7	79.4	110.5	..	..	14
15	759	80.5	81.2	78.3	S.	Cumuli.	800	90.2	89.5	81.8	S. W.	Cumulo strati.	773	94.7	93.8	82.9	S.	Ditto	695	97.7	96.8	82.7	S. W.	Ditto	685	96.9	94.8	82.4	S. W.	Ditto	689	90.7	89.8	80.7	S.	Ditto	98.8	89.9	81.0	112.0	..	..	15
16	759	79.7	80.2	78.0	S. S. W.	Clear.	792	91.1	90.3	81.2	S. W.	Clear.	756	96.0	95.0	83.4	S.	Ditto	687	96.0	94.7	83.2	S.	Cirro cumuli.	662	95.0	93.4	81.9	S.	Cirro cumuli.	665	89.8	89.0	81.0	S. S. W.	Cirro.	97.6	89.0	80.4	111.0	..	..	16
17	721	79.3	79.8	76.9	S. W.	Ditto	767	90.4	90.0	81.2	S. W.	Ditto	724	98.0	97.7	81.8	S. W.	Ditto	626	101.8	100.0	82.7	S.	Clear.	597	100.3	98.9	82.9	S. W.	Clear.	607	92.5	91.2	82.2	S. S. W.	Clear.	103.9	91.5	79.9	121.4	..	..	17
18	731	78.3	78.9	74.8	S. S. W.	Ditto	783	93.2	92.4	78.3	S. S. W.	Ditto	755	100.4	99.3	75.0	S. W.	Ditto	672	100.9	99.0	81.0	S. W.	Ditto	658	99.2	97.6	81.5	S. S. W.	Ditto	670	91.8	90.5	78.8	S. S. W.	Ditto	104.0	91.4	78.8	124.0	..	..	18
19	753	79.0	79.9	74.0	S. S. W.	Ditto	801	91.9	91.8	77.7	S. S. W.	Ditto	766	100.2	99.2	75.7	S. W.	Ditto	692	100.8	99.8	80.7	S.	Ditto	669	99.6	97.8	79.9	S.	Ditto	685	91.2	90.5	80.6	S.	Ditto	104.1	92.0	79.8	121.4	..	..	19
20	779	79.7	80.3	76.9	S. W.	Cirro cumuli.	864	90.2	90.4	79.4	S. W.	Ditto	816	98.5	97.2	76.2	S. W.	Cirro cumuli.	718	103.7	101.9	74.9	S. W.	Cirro strati.	700	99.2	96.0	79.6	S. S. W.	Cirro strati.	721	90.3	89.6	77.0	S. W.	Cirro cumuli.	104.3	93.8	80.3	125.5	..	..	20
21	791	79.4	80.2	76.7	S. S. W.	Ditto	850	88.0	88.1	78.0	S. W.	Cumuli.	810	94.5	93.2	77.4	S. W.	Cloudy.	743	94.0	92.8	76.6	S. S. W.	Cumuli.	714	97.2	95.0	74.9	S. W.	Cumuli.	701	89.8	88.5	80.2	S. S. W.	Ditto	97.3	88.8	80.2	116.0	..	..	21
22	768	79.9	80.3	78.0	S.	Ditto	817	89.7	89.8	79.8	S.	Cumulo strati.	779	92.0	91.4	78.9	S. S. W.	Cumulo strati.	711	90.2	89.3	77.9	S. W.	Cloudy.	716	86.3	86.2	78.3	S. W.	Cloudy.	710	80.9	81.4	73.2	S.	Cloudy.	93.0	86.8	80.5	103.7	0.00	0.06	22
23	786	78.8	79.3	75.5	S. W.	Cloudy	821	89.7	89.0	76.5	S. W.	Cirro cumuli.	784	94.4	94.2	76.0	S. S. W.	Clear.	716	95.3	94.8	77.8	S. S. W.	Clear.	692	94.3	92.3	78.4	S.	Clear.	693	87.5	86.9	75.8	S.	Cirro strati.	97.5	88.5	79.5	111.3	..	..	23
24	759	78.7	79.0	76.3	S. S. W.	Clear.	780	90.7	90.2	79.3	S.	Clear.	751	93.9	93.4	81.4	S.	Ditto	663	96.1	95.0	81.4	S.	Cumulo strati.	658	85.9	84.7	79.7	S. W.	Rainy.	617	85.3	85.										





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*Notes, chiefly Botanical, made during an excursion from Darjiling to Tongló, a lofty mountain on the confines of Sikkim and Nepal, by J. D. HOOKER, M. D., R. W., F. R. S., &c. Honorary Member of the Asiatic Society. (Communicated by the Hon. Sir JAMES COLVILLE, PRESIDENT As. Soc.*

*May 19th, 1848.*—Left Darjiling in the forenoon of this day, accompanied by my friend, C. Barnes, Esq. We took with us a small tent, about 15 Lepcha and Ghorkha coolies, together with as few servants as possible, these being bad mountaineers, and our route involving much ascent and descent. The direction is W.; the distance, in a straight line, little above 12 miles; but occupying good 3 days' march; for we have to descend from Darjiling 5000 feet to the intervening river beds, cross these and as many spurs of 1000—1500 feet, and thence ascend to a summit 10,000 feet above the sea. The route is of course wholly within the sub-Himalaya, and always through the forest region. What clear spots we saw were artificial, and large trees extend to the top of Tonglo; which is however below the lower limit of Alpine Pines in this parallel, and of the Arctic vegetation of the loftier Himalaya.

A Lepcha carries his load in similarly formed, but much ruder baskets, than those used by the Nepal races, and I observe that he uniformly used shoulder straps, with or without the belt across the forehead, which latter is most frequently wholly dispensed with.\* The weight thus

\* May not the use of the head-strap be a predisposing cause of goitre, by inducing congestion of the Laryngeal vessels? The Lepcha is certainly far more free of this disease than the Bhothea, or than any of the tribes of E. Nepal I have

transported to great distances is very surprising; on an average our Lepcha loads weighed 100 to 120 lbs. On our return we had the curiosity to weigh the then sodden tent, which was 180 lbs., and had been carried for 10 hours both up and down hill in this state. To keep the contents of the basket dry, the Lepcha makes a large hood of bamboo platting, enclosing layers of leaves of *Scitamineæ*; this fits over their heads and baskets, reaching as low as the hips, but open in front, and leaving both the upper and lower limbs free.

In point of climate Tonglo shares the excessive humidity of the rest of Sikkim, though when viewed from Darjiling it is often seen to be clear when all the northern and much nearer eastern and south-eastern mountains are wrapped in clouds. This arises from its position, and its protection from the S. E. or rainy wind. It rises as a long saddle, from that great southern spur of Kunchin-jinga, (which should bear the general name of Singalelah) and which, dividing Nepal from Sikkim throughout its whole length, extends from the perpetual snows of perhaps the loftiest mountain on the globe, to the plains of India. The direction of this ridge is of course meridional. At right angles to, and a little south of Tonglo, the Sinchul ridge of 9000 feet, meets that of Singalelah, and thus two sides of a box are formed, one of which, the meridional, encloses Sikkim to the west, whilst the other shuts it off from the plains on the south. Darjiling, placed on a spur projecting N. from Sinchul, is a ridge parallel to that of Tonglo, which bounds its western horizon. Throughout the greater part of the year the S. E. wind prevails, rising at sunrise, and its vapors are condensed at once on the forests of Sinchul; billowy clouds rapidly succeed small patches of vapor, and rolling over to the N. side of the mount, are carried N. W.,

mixed with, and he is both more idle and less addicted to the head-strap as a porter. I have seen it to be almost universal in some villages of Bhotheas, where the head-strap alone is used in carrying in both summer and winter crops, as who amongst the salt traders, or rather those families who carry the salt from the passes to the Nipalese villages, and who very frequently have no shoulder-straps, but invariably head bands. I am far from attributing all goitre, even in the mountains to this practice, but I think it is proved, that the disease is most prevalent in the mountainous regions of both the old and new world, and that in these the practice of supporting enormous loads by the cervical muscles is frequent. It is also found in the Himalayan sheep and goats, which accompany the salt traders, and whose loads are supported in ascending, by a band passing under the throat.

over a broad intervening valley, to Darjiling. There they bank on the east side of the spurs, and this being clear of trees, the accumulation is slow,\* and always first upon the rare clumps of woods. Very generally by 9 A. M. the whole eastern sky, from the top of Darjiling ridge, is a dense fog, the western exposure enjoying sunshine for an hour or two later. At 7 or 8 A. M., very small patches are seen to collect on Tonglo, which gradually dilate and coalesce, but do not shroud the mount for some hours, generally not before 11 A. M. or noon. Before that time however, masses of mist have been rolling over Darjiling ridge to the westward, and gradually filling up the valleys, so that by noon or 1 P. M. every object is in cloud.

Towards sunset it falls calm, or a light S. W. wind springs up. In the former case the mists rise, first from the S. E. mounts, and especially if the S. E. wind, exhausted of its surplus vapors, still blows. This raises the clouds first from Sinchul, and when this is not clear, Tonglo breaks through the western mists. If on the other hand a S. W. breeze sets in, or a W., or N. W., Tonglo clears first.

In descending from Darjiling the zones of vegetation are marked well at a little below 7000 feet, or between 6000 and 7000 by—(1.) The oak, chestnut and *magnolia*, the main features of 7000—10,000 feet. (2.) Immediately below 6500, the Tree-fern† appears (*Alsophila gigantea*, Wall.), a widely distributed plant, common to the Himalaya from Nepal eastward to the Malayan Peninsula, Java and Ceylon. (3) Palms, a species of *Calamus*,‡ the “Rhenoul” of the Lepchas. This, though

\* I have the singularly good fortune to occupy in Mr. Hodgson’s house the most favorable spot in the station, for watching the diurnal march of atmospheric phenomena. My host’s house is placed on an eminence, 500 ft. above the main body of the Darjiling spur, and at its upper or southern extremity;—it commands an unimpeded prospect to the N. W. and E. having the snows of Kunchin-jinga to the N. and the superb sweep of 80 miles of snow from its summit round by N. E. to E. To the S. E. Sinchul:—and to the west the Singalelah range, from Kunchin to Tonglo. The station stretches N. in full front, as a sharp ridge. I have found it difficult to make old residents of one or other side of Darjiling spur, believe, that whilst their house in the western slope is enjoying hours of sunshine the whole western side is enveloped in fogs.

† Of this I have seen but one species in the mountains, a very similar, or possibly distinct species, grows at the foot of the outer range.

‡ The fruit of all the *Calami* are eaten by the Lepchas and the stems of larger species applied to various economic purposes.



not a very large species, climbs lofty trees, and extends some 40 yards through the forest; 6500 feet is the upper limit of palms in the Sikkim Himalaya, and one species alone attains so great an elevation. Four other *Calami* range between 1000 and 6000 feet, on the outer hills, some of which are found 40 miles distant from the plains. The other Palms of Sikkim are, "Simong"—a species of *Caryota*, which I have not procured flower or fruit; it is rare, and ascends to nearly 6000 feet. *Phoenix*,\* a small stemless species, probably *P. acaulis*, Buch. (*P. humilis*, Royle?) which grows on the driest soil in the deep valleys (Schaap of the Lepchas). *Wallichia*† *caryotoides*, apparently the plant described by Roxburgh,‡ and if so, having a very wide range (Assam and Chittagong). It is the "Ooh" of the Lepchas, who make no use of it.—Dr. Campbell and myself, during a recent journey in Sikkim, found that it is an admirable fodder for horses, who prefer it to any other green food to be had in these mountains. A species of *Areca* unknown to me, is the 8th and only other Palm of these mountains, but a *Cycas* (*C. pectinata*) occurs in the deepest and hottest valleys, with the India-rubber fig,—the western limits of both these interesting plants. Of *Pandanus* there is one graceful species at elevations of 1000 to 4000 feet, ("Borr," Lepcha.)

3. The third striking feature in the vegetation in descending from 7000 feet, is a wild plantain, which ascends to above 6000 feet; ("Lukhlo," Lepcha.) This is replaced by another and rather larger species at lower elevations; both of them ripen their austere and small fruits, which are full of seed and quite uneatable; good specific characters are to be drawn both from the male flowers, and the size, form and color of the seeds. The commonly cultivated plantain of Sikkim is, I am always assured, an introduced stock, (nor have the wild species been ever cultivated,) it is very large, but poor in flavor and does not bear seeds.

The zones of these three conspicuous plants are very clearly defined in descending any where from Darjiling, and especially if the traveller, standing on one of the innumerable spurs which project from the ridge,

\* The feathery fronds of the *Phoenix* are used as screens in hunting, no other use is made of any part of the plant except the young seeds being eaten.

† Von Martins in a forthcoming part of his superb work, retains Roxburgh's generic name of *Wallichia* for this palm.

‡ Roxb. Fl. Ind. v. 3. p. 621, (*Wrightea*).

cast his eyes up the gorges of green on either hand. Firing the forest is so easy in the drier months of the year, that a good deal of cultivation is met with on the spurs, at and below 5000 feet, the level most affected by the Lepchas, Limbos and Sikkim\* Bhotheas. The mountain slopes are so steep, that these spurs, or little shelves, are the only sites for habitations between the very rare flats on the river banks, and the mountain ridges, above 6000 feet, beyond which elevation cultivation is rarely if ever carried by the natives of Sikkim. The crops are the usual ones of the plains, and the agriculture similar, with one important exception, that rice is hardly ever irrigated. This appears the more remarkable, as on crossing the Singalelah range into Nepal, in localities there as steep as those covered with rice-crops in Sikkim, irrigation is almost universally resorted to. The varieties of grain are different, but as many as 8 or 10 kinds are grown without irrigation by the Lepchas, and the produce is described as very good (80 fold). Much of this success is due to the great dampness of the climate; were it not for this, the culture of the grain would probably be abandoned by the Lepchas, who never remain for more than three seasons on one spot.

At the bottom of the valley is a small village of Lepchas, Limbos and Murmis, the tribe aggregated in groups, on one spur, and surrounded with small fields of the usual summer and winter crops of the plains. The Lepcha house is far more roomy and comfortable than that of the others; it is generally square, built on posts, with a stage in front of the door, and low-eaved thatch of bamboo stems, split and laid flat. The walls are of bamboo wattle-work. In all respects it resembles the Bhootea house, but these are larger, better, and the framework is of strong wooden beams, for it is not worth the Lepcha's while to render his habitation strong and durable. Both Limbus and Murmis build smaller houses, often on the ground, but more frequently raised; the roof is of grass-thatch or occasionally of a piece of bamboo work matting.

\* I apply the term Sikkim Bhotheas to the more recent immigrants from Thibet, who have settled in Sikkim, and are an industrious, well conducted people. The Bhotheas again of Bhotan, to the eastward, rarely reside, except at Darjiling, and bear the worst reputation (and most deservedly) of any of the numerous people who flock to this station. These should not be confounded with any other Bhothean tribes of Thibet, Sikkim or Nepal.

The soil at the bases of these hills is very fertile, owing to the washing down of vegetable mould from above, the rapid decomposition of the rocks and the ashes of the burnt forest. Beneath the mould is generally a stratum of red clay which uniformly covers the hills at all elevations, and to a greater or less depth, even 15 feet. This varies much in quality, apparently owing to the admixture of matter from the subjacent rocks. Of the latter some gneisses decompose with the greatest rapidity, others resist for ages the elements. A clayey soil covers even the sharpest ridges, retained in its position by the arboreous vegetation; much of it makes excellent bricks, from containing a very large percentage of alumina.\*

A large bamboo ("Pao," Lepcha) is the prevailing plant near the base of these valleys; it attains a height of 40—60 ft. and the culms average in thickness the human thigh; it is unarmed, deep green, or purplish, and used for large water vessels. Besides this there are nearly a dozen kinds of bamboo known to the Lepchas, and all have been pointed out to me. Whether these are different species or no it is impossible to say, for different genera are too similar in their foliage to be thereby specifically distinguished. Three kinds usually flower, one commonly, and of these, two bear no leaf on the flowering plant, which dies after seeding. A certain patch of ground or clump of plants seem to flower at the same time, but I could not detect, nor do the Lepchas recognize any cause for this isolation of the flowering plants. Bamboos, in the general acceptation of the term (for remotely allied genera bear the same trivial English name,) occur at all elevations below 12,000 feet, forming even in the Pine-woods and above their zone in the skirts of the *Phododendron* scrub, a small and sometimes almost impervious jungle. It would take many pages to describe the numerous purposes to which the various species, even in Sikkim, are put. In an economical point of view they may be classed into those which do, and those which do not split readily. The young shoots of one or more are eaten: and the seeds of another, raw, cooked, and made into a fermented drink.

*Gordonia* is here the common forest tree; (*G. Wallichii*?) an erect and singularly handsome tree, much prized in all parts of the sub-

\* Nearly 30 per cent. according to the analysis of my friends, J. and C. Muller, Esqs.

Himalaya, and universally adopted for ploughshares and other purposes requiring a hard wood: it is the "Sing-brang-kun" of the Lepchas, and ascends 4000 ft. on the mountains. In very dry soils it is replaced by "Sal" (*Vateria robusta*), and more rarely by the *Pinus longifolia*.

"Toon" (*Cedrela toona*) "Simalkun," Lepcha, and another species, probably *C. serrata*, Royle, accompany the *Gordonia*, as does *Englehardtia*, which ascends to 6000 ft. and several leguminous trees, *Acacia*, *Dalbergia*, *Terminalia* and a *Sonneratia*. Oaks at this elevation occur as solitary trees, of species different from those of Darjiling. There are 3 or 4 with a corn-formed fruit at this elevation, and 3 with spinous cups enclosing the nut, which generally affect a dry clayey soil.

*Phyllanthus emblica*, *Grislea*, *Symplocos* and other small trees and bushes of the plains, occupy the more open spaces near the streams. *Cucurbitacea*, *Marlea* and scandent *Leguminosa* skirt the forest. *Tici* and *Cloranthus* with Ferns inhabit rocky places, and an amaranthaceous plant (Arrua?) climbs over the loftiest trees; its copious inflorescence, like hops, whiten the forest in some places. *Sterculia*, of 2 species, are common, as is *Pæderia foetida*, which, as well as many *Cucurbitaceæ* peppers, *Gnetum*, *Porana*, a few *Convolvulaceæ* and many *Asclepiadoideæ*, *Hoya*, &c. climb high.

Though the temperature of the air was only 77° at noon, these valleys are close and oppressively hot: the streams small and varying in temperature, according to the exposure of their banks; that of the first we crossed was 70°.

Some low steep spurs which we crossed, were well cultivated, though the angle of the field was upwards of 25°. The crops, chiefly maize, now sprouting. The maize is occasionally hermaphrodite in Sikkim, the bisexual flowers forming a large drooping panicle and ripening small grains. This is a rare occurrence, and the specimens are highly valued by the people.

On the ridge a "Semul" tree (*Bombax*) grows, at upwards of 3000 ft.; it is a very rare tree at this elevation, or any where else within the mountains. *Mussaenda* is conspicuous for its white calycine leaves snowing the tree. A *Lysimachia*, very like the *L. nemorum* of Europe, grew near its foot.

Descending to another stream, the path led through a low dense



jungle of bamboo and figs\* of several species. Indeed the general prevalence of these and their allies, the nettles, is a remarkable feature in the botany of the Sikkim Himalaya, up to nearly 10,000 ft. Of figs there were here 5 species, some bearing eatable fruit of enormous size and very palatable, others with the fruit small and borne on prostrate creeping leafless branches, which spring from the root of the tree and creep along the ground. The wild Mulberry is a common small tree in these situations, with three species of nettle,† several of *Bœhméria*,‡ *Procris*, *Trophis*, *Celtis* and *Conocephalus*. Of shrubs are *Randia*, *Gardenia*, and *Rondeletia*, *Citrus*, *Rotlera* and other *Euphorbiaceæ*, some *Sapindaceæ* and *Terebinthaceæ*. *Scitamineæ* were not above ground, grasses are rare, and indeed most monocotyledonous plants at this season. Of terrestrial *Orchideæ* there are several species, *Dendrobium* takes the place in the valleys of *Cœlagyne*, the common epiphytical genus at Darjiling.

A troublesome Dipterous insect swarms on the banks of the stream, it is very small and black, floating like a speck before the eye. The bite of this (the "Peepsa") leaves a small spot of extravasated blood under the cuticle, very irritating if not opened.

Temperature of the water (the Little Rungeet river) 69° at 4 p. m., and of the air 75°.

Crossing the Little Rungeet we ascended another steep spur from the base of Tonglo, and camped.

Night calm and clear, with a little cirrus, but no dew formed. A Thermometer sunk 2 feet in rich vegetable mould stood at 78° two hours after it was lowered, and the same after ten hours interval on the following morning. This probably indicates the mean temperature of the month at that spot, where, however, the dark color of the exposed loose soil must raise the temperature considerably.

May 20th.—Temperature at sunrise 67° ; morning bright, clear overhead, but the mountains looked threatening. Darjiling perched on a ridge 5000 ft. above us, has a singular appearance. Descended from the

\* One species of this very tropical genus ascends almost to 9000 ft. on the outer range of Sikkim.

† Of two of these cloth is made, and of a third cordage. The tops of two are eaten, as are several species of *Procris*?

‡ Two species yield a fibre, one the "Poa."

spur to a narrow ravine, choaked with *Calami*, Figs, and the *Wallichia*, and crossing a stream ascended the Simonboug spur of Tonglo, so called from a small village and Lama convent of that name on its summit. The cultivation is of rice, murwa (*Eleusine*), millett, yam, brindjal, bhang, buckwheat of 2 species, fennell and cummin, &c. A white flowered Rue, *Ruta albiflora*, is sometimes cultivated, and very common; truly wild at elevations of 3 to 7000 ft.; it is commonly used for all diseases of fowls, mixed with their food.

*Aquilaria*, *Myrsine*, *Embelia*, *Ardisia* and *Mæsa* all occur at 3 to 6000 ft., and we passed through groves of a handsome shrubby *Tephrosia* in full purple flower. Near the top of the spur *Rubi* and *Osbeckia* appeared, the former of several species; and hence upwards the brambles are very frequent, to 12,000 ft., between which and this level upwards of 12 species occur. These flower at different seasons, one was already in fruit, bearing large-sized well-flavored yellow fruit, as big as a raspberry.

At noon, arrived at the top of the spur, and passing some chaits,\* gained the Lama's residence and temple. The latter, nothing more than a rather large wooden Bhothea house raised on a stone platform. As we stopped here on our way down I shall allude to it afterwards more particularly.

Two species of bamboo, "Payong" and "Praong" of the Lepchas, here replace the "Pao" of the foot of the hills. The former flowered abundantly, the culms, 20 ft. high, being wholly a diffuse panicle of inflorescence. The "Praong" bears a round head of flowers at the apices of the leafy branches. Wild strawberry, violet, *Lysimachia* of several species, *Geranium*, *Polygona*, *Veronica*, &c. announced our approach to the temperate zone. In the outskirts of the temple were potato crops and peach trees. The potato thrives extremely well in Sikkim, though I think the root cultivated in Purneah district, from the Darjiling stock, is superior both in size and flavor.

Peaches never ripen in Sikkim, apparently from the want of sun;

\* The chait of Sikkim (borrowed from Thibet) is a square pedestal, surmounted with a hemisphere, the convex end down and terminated with a cone, crescent and disc. These are erected as tombs to Lamas, and in memory of illustrious people, and are venerated accordingly, the people always passing them from right to left, often repeating the invocation "Om mani Padmi hom."

the tree grows well at 3—7000 ft. and flowers abundantly, and its fruit makes the nearest approach to maturity (according to the elevation) from July to October. At Darjiling it follows the English season, flowers in March and fruits in September, when the scarce reddened and still hard fruit falls from the tree.

It is curious that throughout this, the temperate region, there is hardly an eatable fruit except the native walnut.\* English cultivated fruits are extremely poor; the native are confined to the walnut, some poor brambles, of which the “yellow” and “ground” raspberry is the best, some insipid figs and a very austere crab-apple. The European apple will hardly ripen, pear not at all. Currants and gooseberries shew no disposition to thrive, and strawberries, which grow well, ripen a flavorless berry. Vines, figs, pomegranates, plums, apricots, &c. will not succeed even as trees.

European vegetables again grow and thrive remarkably well throughout the summer of Darjiling, and the produce is very fair to look upon, sweet and good, but inferior in flavor to the English.

Of tropical fruits cultivated below 4000 ft. the orange and banana alone are frequent, with lemons of various kinds. The season for these is however very short, that of the plaintain might with care be prolonged, but the fruit, as I have said above, is poor; oranges abound in winter, and are excellent in flavor, but neither so large or free of white pulp as those of South America, the W. Indies or W. coast of Africa. Mangoes are brought from the plains; they do not thrive in the valleys, and though I have seen the pine-apple plant I never have its fruit.

A singular and almost total absence of sun's-light in the fruiting season, and of the heat of his direct rays, is the cause of this dearth of fruits. Both the farmer and orchard gardener knows full well in England, the value of a bright sky as well as a warm autumnal atmosphere. Without this his corn does not ripen and the fruit trees blight. The winter of the plains of India, being more analogous in its distribution of moisture and heat to an European summer, such fruits as the peach, vine and even plum, the fig, strawberry, &c. may be brought to bear

\* The walnut of Sikkim has the shell extremely hard, of Bhotan as remarkably thin, in both the kernel is excellent; but not worth the trouble of freeing from the shell in Sikkim. Bhotan walnuts are largely exported from that country, and are in all respects excellent.

well in March to April and May, if they are only carefully coaxed through the previous hot and damp season, which is, in respect to the functions of flowering and fruiting, their winter.

Hence it appears that, though some English fruits will turn the winter solstice of India (November to May) into summer, and then flower and fruit; neither these nor others will accept the summer of 7000 feet on the Himalaya, though its temperature so nearly approaches that of England, as a compensation for the accumulated evils of its excessive rains and fogs. Further, they are often exposed to a winter's cold no less rigorous than the average of that of London, the snow lying for a week on the ground, and the thermometer descending to 25°. It is true that in no case is the extreme of cold so great here as in England, but it is sufficient to check vegetation, and to prevent fruit trees flowering till they are fruiting in the plains. There is a great difference herein between the climate of the central, and eastern and western Himalaya, at equal elevations. There the winters are colder and more comfortless than in Sikkim. The summer warmer and less humid. The rainy season is shorter and the sun shines so much more frequently through the heavier showers, that the apple and other fruits are brought to a much better state. It is true that the rain gauge shews a greater fall there, but this is no measure of the humidity of the atmosphere, or still less of the amount of the sun's direct light and heat intercepted by aqueous vapor. It takes no account of the quantity of moisture suspended in the air, nor of the depositions from fogs, which are far more fatal to the perfecting of fruits, than the heaviest brief showers.

In the valley of Nepal, Mr. Hodgson informs me, that at 4000 feet the apple, though flavorless, ripens well and is a good fruit, as are two varieties of the European fig, but these follow the seasons they do in the plains, the winters being so mild that snow is hardly ever seen, and never lies on the ground. There however the plantain and mango do not ripen, nor the orange always. It is too warm for gooseberries, currants and raspberries, and too rainy for the vine. Apricots may be produced with care, but hardly peaches.

The Indian solstices, which are marked by one season of excessive drought, and the other of excessive humidity, can never be favorable to a copious fruit market. The obstacles to the produce of good Euro-



pean fruits, either in the plains or hills is manifest, nor do the tropical flourish as in other quarters of the globe, where the seasons are not so contrasted. Hence there is not one good fruit peculiar to the country, and perhaps but one which arrives at the highest perfection; I mean the mango. The plantains are good, so are the oranges, pine-apples, but all these are far more abundant, most of them of much better kind, and all of them enjoying a much longer season in other warm climates. Who that has walked the fruit-markets of South America, the West Indies, or Western Africa, has not been struck with the perennial profusion of all the above fruits, and many more besides, which are unknown to India.

On ascending Tonglo, we left cultivation, and the poor groves of peaches at 4—5000 ft., and this on the eastern exposure, which is a good deal the sunniest, and at the average level to which agriculture reaches in Sikkim. Both in Bhootan and in E. Nepal cultivation is carried much higher, the more flourishing salt trade, and probably easier nature of the passes, favoring the formation of fixed habitations much nearer to the perpetual snow than in Sikkim, where the enormous mass of Kunchinjinga, intrudes its snows considerably south of the main range, and forbids cultivation within upwards of fifteen miles from its summit, in any direction. The uniform clothing of the forest too allows of no pasturage.

Above Simonborg the path to Tonglo top is little frequented, and chiefly as one of the many routes between Nepal and Sikkim which cross the Singalelah spur of Kunchinjinga, at various elevations, generally less as they are remote from the Himalaya crest, and varying from 6000 to 7000 ft. As usual, the track runs along ridges wherever these are to be found, very steep, and narrow to the top; through deep humid forests of oak, and *Magnoliaceæ*, many *Lauri*; both *Tetranthera* and *Cinnamomum*, one species of the latter ascending to 8500 ft., and of *Tetranthera* to 9000. Chesnut and Walnut here appeared, with *Elæocarpus*, and some leguminous trees, which however did not ascend to 6000 ft. Scarlet flowers of *Vaccinium serpens* strewn about, an epiphytical species, and above these the great blossoms of a *Rhododendron* and *Magnolia* lay together on the ground. The *Rhododendron*\*

\* A drawing and description of this are preparing for publication in England under the name of *R. Dalhousiæ*.

is a beautiful epiphytcal species, growing on the larger oak limbs, and bears clusters of 6—8 flowers of greater dimensions than any known species; these are pure white and deliciously scented of lemon. This *Magnolia* forms a large tree very densely foliaged, the leaves a deep shining green. Most of the flowers drop unexpanded from the tree, and have a very sweet aromatic smell; they are as large as the human fist, the outer sepals purple, the inner pure white. Ovaria collected into an ovate, acute, very short, dense head. It may be the *Liriodendron litifera*, Wild. (Rox. 2, p. 654). The fruit differs from either *Magnolia* or *Michelia*, and I need not say equally so from *Liriodendron*. In every flower I picked up, there was either a coleopterous grub, or lamellicorn beetle, in the centre of the receptacle.

Heavy rain came on at 3 P. M. obliging us to take insufficient shelter under the trees, and finally to seek the nearest camping ground. For this purpose we ascended to a spring, called Sinasibong, at an elevation of 6000 ft. The narrowness of the ridge prevented our pitching the tent, small as it was, but the Lepchas rapidly constructed a house, and thatched it with bamboo and broad leaves of the wild plantain. A table was then raised in the middle, of 4 uprights and as many cross pieces of wood, lashed with strips of bamboo. Across this pieces of bamboo were laid, ingeniously flattened by taking lengths, crimping the cylinders all round, and then cutting it down one side, so that it opens into a flat slab, several inches across. Similar but longer and lower erections, one on each side the table, formed couch, bed or chair; and in one short hour, half a dozen men, with only the long knife and active hands, had fitted us with a tolerably water-tight furnished house. A thick flooring of bamboo leaves keeps the feet dry, and a screen of these and other foliage all round, renders the habitation tolerably warm.

It is at a little below this elevation, 3—5000 ft., that great scandent trees of the forests, enveloping trunks of others wholly or twisting round them, strangle the greatest of these, which decaying from out their folds, leave the reticulated sheath of climbers, as one of the most remarkable vegetable phenomenon of these mountains. Such belong to several orders, and may roughly be classified in two groups, 1. those which merely twine, and by constructing certain parts of their support, produce death; 2. those which form a reticulated mass or network round the trunk, by the coalescence of their lateral branches and rootlets, &c.

These wholly envelope and often conceal the tree they enclose, whose leafy bowers then appear aloft far above those of its future destroyer. To the first of these groups belong many natural orders, of which the most prominent are *Leguminosæ* (*Bauhinia*, *Cæsalpinia*, *Dalbergia*, *Galedupa*, *Butea*, *Robinia*, *Mimosa*). Vines, *Pothos*, *Bignoniaceæ*, *Menispermaceæ*, *Malpighiaceæ*, and a few other natural orders. The inosculating branched ones are almost all figs.

At night the Lepchas sit late chatting round the fire, wretchedly housed, miserably clad, and very insufficiently fed. A more thoroughly happy people it would be difficult to find any where; they very rarely quarrel amongst themselves, and their disposition is singularly cheerful and lively. The flute is their favorite and only musical instrument; it is of bamboo, has only 4 equi-distant holes, situated far below the mouth-hole, which again is remote from the butt end of the instrument. It is very difficult to sound, the tone low and sweet. I have often listened with real pleasure to the simple music of this rude wind instrument; its voice is singularly æolian, as are the airs usually played, which fall by octaves; it seems to harmonize with the solitude of their primæval forests.

A thermometer sunk 2 feet 4 inches in the deep vegetable mould and clay, fell to 62°, and stood at 61.7 on the following morning.

Except for the occasional hooting of an owl, the night was profoundly still for several hours, after dark, it being too early in the season for the Cicadas. A dense mist shrouded every thing and the rain pattered on the leaves of our hut. At midnight a tree frog broke into the stillness with his curious metallic clack, and others quickly taking up the burthen, they kept up their strange intercourse till morning. This is called the "Simook" (Lepcha), and like so many Butrachians, has a voice less like that of an animal, than any organized creature I know. The cries of beasts, birds and insects are all more explicable to our senses, and we can recognize most of them as belonging to such or such an order of animalia. But the voices of many frogs are like nothing else, and allied species utter noises which betray no affinity between them. In some, as this, it is the sound of the concussion of metals, in others of the ringing of steel or brass, any thing but the natural effects of lungs, larynx and muscles.\*

\* A very common Tasmanian species, utters a sound that appears to ring in an underground vaulted chamber beneath the feet.

May 21st.—Early this morning we proceeded upwards, our prospects more gloomy than ever. The road, still carried up steep ridges, is very slippery, owing to the rain upon the clayey soil, and only passable from the hold afforded by interlacing roots of trees. At 8000 feet some enormous detached masses of micaceous gneiss rise abruptly from the ridge; these are covered with mosses, ferns, *Cyrtandrea* and *Begonia* and creeping *Urticeæ*. Such masses occur on all the sharp ridges, and at all elevations, they project awkwardly through the soil, and are strangely confused and distorted in the stratification, down even to the ultimate lamination of the mica, felspar and quartz. They are split and never in situ, generally strangely shattered, and are evidently not the mere exposed top of any continuous rock forming the nucleus of the mountain. The invariably sloping faces of these hills and spurs, never broken into precipices, and never presenting flats or table-lands, are signs of their internal composition being a shattered mass. A uniformly dipping stratified rock of any extent would, if raised at the angle of the slopes of these hills, present a precipitous face somewhere; but the ranges of 4—8000 ft., ramify and inosculate in all imaginable directions, without presenting a bold face any where near Darjiling. The road cuttings from the plains to the Sanatarium, as well as the landslips, reveal highly inclined continuous strata, all variously distorted and much dislocated, but these are only at the foot of the hills. Above 4000 ft. all appears a strangely piled mass of gneiss rocks, with no uniformity of dip. Amongst these the red clay lies deeper or shallower as the masses are so disposed as to retain it or otherwise.

These rocks are sealed by the roots of trees, and from their summit (7000 ft.) a good view of the surrounding vegetation is seen. The mass of the forest is formed of (1) oak, 3 species of which, *q. annulata*? with immense lamellated acorns, and leaves sometimes 16 inches long, is the noblest in stature and the most abundant. (2) Chestnut. (3) *Laurineæ*, of several species, beautiful forest trees, straight-holed and umbrageous above, chiefly *Tetranthera* and *Cinnamomum*. (4) *Magnoliacæ*, three species of *Michelia*. Other trees are *Pyries*, *Saurauja*, both an erect and climbing species, *Olea*, Cherry, Birch, Alder, Maple, (*Acer*), *Hydrangea*, and one species of Fig, Holly, several *Araliaceous* trees, *Sambucus* arborescent *Rhododendrons* commence here with the *R. arboreum*, which only occurs at one spot near Darjiling, (Mr.



Hodgson's grounds on Jillapahar, 7500 ft.,) *Helwingia*\* and brambles are the prevalent shrubs. Ferns are not fully expanded yet, and the tree ferns upper limit is passed. This is the region of pendulous mosses, lichens, and many herbaceous plants; of which latter, except *Arums*, few had yet appeared above ground.

The pendulous mosses are chiefly species of *Hypnum*, *Nerkena*, &c. the Lichens, *Borrera* and *Usnea*. Of *Arums*, a *Speciosum* particularly effects this level, with some green spotted compound leaved kinds, and the small *Remusatia* (*vivipara*) on the rocks and trunks of trees. Neither *Pothus* (*Scindapsus*) *officinalis*, *decursiva*,† nor *Scandens* are found higher up the mountain; *Arum curvatum*, Roxb., and several species of *Arisæma* are very frequent. *Calla*, *Colocaria* and *Lasia* are confined to lower levels.

Peppers reach this elevation, but no higher, whilst very prevalent shrubs are *Adamia cyanea*, *Pittoporum*; *Eurya* and *Camellia* in drier places. *Hypericum japonicum*? Some species of *Vitis* ascend thus far, and several *Cucurbitaceæ*, *Zanthoxylon* and *Sapindaceæ*. Still ascending along very slippery paths, a considerable change is found in the vegetation of the following thousand feet, from 8000 to 9000. In the forest trees, by two gigantic species of *Magnolia*, replacing the *Michelias*, and just past flowering. The *Quercus annulata* is less abundant. Chesnut disappears, with several *Lauri*; other kinds of Maple are seen, and the *Rhododendron arboreum* is replaced by a much larger species, with capitula of very large white flowers and magnificent foliage, 16 inches long. *Corneæ*, *Viburnum*, and *Lonicera* are frequent, with two or three *Hydrangeas*; many *Laurinæ* and some new oaks.

*Helwingia* is still more abundant as a bush, with climbing and shrubby *Smilacineæ*, epiphytical and other *Vaccinia* and *Qualtheriæ* *Stauntonia* forms a handsome climber, with beautiful pendent clusters of lilac blossoms. The *Arabaceæ* are chiefly scandent species, and

\* A new species of this most remarkable genus, which I propose naming after M. Decaisne, the able describer of the natural order, which hitherto included but one species, a native of Japan. The natural order, whose place in the vegetable kingdom has been considered doubtful, I regard as next to *Araliaceæ*.

† The juice of this is used by Lepchas and Botheas for fixing the poison of *Aconitum*, and other plants, on to their arrow-heads. It is said to increase the effect of the poison.

herbaceous, as *pseudo-ginseng*. *Symplocas*, *Limonia* and *Celastrus* are common shrubs, and small trees. *Cipus capreolata* clothes the trees up to this height. I have not observed *Cyrtandraceæ* or *Begonias* to ascend higher than this.

At 9000 ft. we arrived on a long flat spur or shelf of the mountain, covered with lofty trees, and a dense jungle of small bamboo. *Magnolias* here formed the majority of the trees, with a few oaks, (*annulata* very rare). Great *Pyri* and two other species of *Rhododendron*, both attaining the height of 30 to 40 feet, *R. barbatum*, Wall., and *R. arbo-reum*, Wall., var. *roseum*, D., *C. Kadsura* and scandent *Arabaceæ* and a *Saurauja* climb the loftiest trees: *Stauntonia* crawls round their base, or over lower bushes. *Limonia* is the common shrub and *Symplocos*. A beautiful orchidæous plant, with pale purple flowers (*Cælogyre Wallichii*?) grows on the trunks of all the great trees, and perhaps attains a greater elevation than any other epiphytical species, for I have seen it at 10,000 ft. A very large, broadly cucullate spathed *Arisæma*, first appears at 8000 ft. and is abundant thence to the top of the mountain, where smaller kinds also abound at 10,000 ft.

It is to be remarked that *Leguminosæ* nowhere appears in Sikkim above 6000 ft. except the *Parochetus communis*, which however I did not see on this ascent. This total absence of one of the largest and most ubiquitous natural orders, through 4000 ft. of elevation, is most remarkable, and characterizes the whole Himalayan range of Sikkim. I know of no parallel case to this any where on the globe. In the equally humid forests of South Chili and Fuegia, the order is extremely rare, but species do exist, and the whole flora of those countries is much poorer than this, in numbers of plants. Grasses also are extremely scarce, anywhere above 4000 ft. and below 10,000 ft., always excepting the ubiquitous bamboos, which by their giant dimensions may fancifully be supposed to compensate the want of many herbaceous species: or it may perhaps be stated better thus:—where the proportion of trees is very great, both in number, species and individuals, arboreous grasses replace the herbaceous species of less jungly regions.

A loathsome tic infests the small bamboo, and a more hateful insect I never encountered. The traveller cannot avoid these coming on his person (sometimes in great numbers) as he brushes through the forest. They are often as large as the little finger nail, get inside one's dress

and inserts the proboscis deeply without pain. Buried head and shoulders, and retained by a barbed lancet, it is only to be extracted by main force, which is very painful. I have devised many tortures, mechanical and chemical, to induce these disgusting intruders to withdraw the proboscis, but in vain.

Leeches\* swarm at below 7000 feet, a small black species above 3000, a large yellow brown solitary one below that. They are troublesome, but cause no irritation. In August and September these absolutely swarm, and are no less troublesome to man than to the feet of ponies.\*

The rain continuing heavily, we rested the men by some large pools on the flat. A small *Lobelia*, *Chrysosplenium*, *Procris*, and *Callitriche*, formed a sward on the banks, amongst which some *Ranunculus* grew (*Diffusus*, Wall, and a similar species) a large and handsome *Carex*, flourished in the water.

*Ranunculus*, though so common a genus literally almost everywhere else, is extremely scarce in the temperate and tropical zone of the Sikkim Himalaya; *R. scelevatus*† abounds in the plains close to the foot of the hills, but between that elevation and 10,000 feet, I have nowhere seen this or another species. Here and probably elsewhere in the Himalaya, the genus is very rare in this zone, though perhaps more abundant in the Asiatic zone above.

*Cruciferae* is another natural order very frequent in the temperate and mountainous regions of all the world, except the Himalaya. A variety of *Cardanime hirsuta*? is absolutely the only plant of this order, occurring wild between the plains of India and the summit of Tongló.

\* I cannot but think that the extraordinary abundance of these *Annelides* in all the grazing ground of Sikkim, may cause the death of many animals. Some marked murrains have followed very wet seasons when the leeches swarm more than ever, and the disease in the cattle described to me by the Lepchas as in the stomach, in no way differs from what leeches would produce. It is a well known fact that these creatures have lived for days in the fauces, nares and stomachs of the human subject, causing dreadful sufferings, and death in the latter case. I have seen the cattle feeding where the leeches so abounded, that 50 or 60 were frequently together on my ancles.

† I never could satisfy myself that this most abundant gangetic plant was truly wild in India. The natives have no name for it; it especially swarms in fields of wheat, flax, mustard, &c. and along the borders of greater and smaller rivers, near or below cultivated spots.

*Compositæ* again are far from represented in the scale they are everywhere else. Though about Darjiling, where clearances have been effected, the amazing prevalence of *Gnaphalium* and *Anaphalis*, &c., give this an appearance of the usual abundance of *Compositæ*, these very species will be found elsewhere scarce in the temperate zone of Sikkim.

*Labiataæ* are also poorly represented, except in clearances.

As far as I can guess, this paucity of representatives of orders for which the temperature of the Sikkim Himalaya is admirably adapted, can best be attributed,—(1.) to the uniform luxuriance of the arboreal vegetation, and the absence of either precipices or naked spots of any kind. (2.) To the humid atmosphere; for some of these groups, as *Leguminosæ*, are very rare in the only temperate climates which in the respect of humidity and equability of temperature, can be compared with Sikkim, namely New Zealand and Fuegia. There, as here, *Cruciferaæ*, *Compositæ*, *Rammeuli*, *Labiataæ*, and above all, *Leguminosæ* and grasses are very rare in the forest region.

Our ascent to the summit was by the bed of a watercourse, now a roaring torrent, for the rain was heavy and incessant. A small *Anagallis* (like *tenella*) and a scapeless *Primula*, grew by its banks, also some smaller *Carices*, and an *Androsace*. The top of the mountain is another flat ridge, with depressions and broad pools or small lakes, in which grew an *Iris*. A square platform (raised by the Surveyor General, whose party were the only Europeans who had previously to ourselves visited this mountain) and which had been cleared from jungle, only the 8 months before, was already fast getting choked with bamboo and various trees.

Upon the very top, though only 500 feet or so above the flat, the number of additional species was great, and all betokening a rapid approach to the alpine or arctic region of the Himalaya, though large forest trees still abounded. In order of prevalence the trees are *Rhododendrons* of 4 species. (1) *R. arboreum*, var. *roseum*,\* which covered the ground as large bushy trees, 40 ft. high. These ramify from the ground, the lower branches being low and patent, and the apices of all loaded with the superb scarlet inflorescence. (2) *R. barbatum*, a tree of nearly the same height, but not so spreading; flowers as copious and

\* Leaves rusty colored underneath, and cordate at the petioli; probably a new species.



beautiful, but foliage brighter, more luxuriant and handsome. (3) *R. Falconeri*,\* MSS., in point of foliage the most superb of all the Himalayan species; trunks inclined, 30 ft. high, branching but little, bark very smooth and papery. Branches naked, except at the apices, where clusters of small white flowers are borne; the corollas are 10 cleft and the stamens numerous. Leaves 18 inches long, very thick above, deep green and wrinkled underneath, covered with a rich deep chesnut-brown tomentum. Next in abundance to *Rhododendrons* are shrubs of *Limonia*, *Symplocos* and *Hydrangea*, forming small trees, but there are still a few *Magnolias*, very large *Pyri*, of three species, and Yew,† the latter 18 ft. in circumference; besides these, *Anisodus luridus*, now in flower, *Pieris*, *Andromeda*, *Olea*, *Celastrus*, *Cerasus* and *Daphne cannabina*. A white flowered rose, *R. sericea*?‡ was very abundant, growing erect, its numerous inodorous flowers pendent, apparently as a protection from the dashing rain. *Kadsura*, *Ochna*, *Stauntonia* and *Clematis acuminata*, were the prevailing climbers. I met with a cucurbitaceous plant at this great elevation, a *Smilax* and *Asclepiadeous* genus (*Holostenura*?). A currant was common, always growing epiphytically on trunks of large trees. Two or three species of *Berberis*, and maple, I think nearly complete the list of woody plants. Amongst the herbaceous and smaller shrubby plants, were many of great interest, as a Rhubarb, *Rheum* (Webbianum?) *Aconitum palmatum*§ a very pretty species, which as well as an undescribed congener, yields the "Bikh" poison of E. Nepal, Sikkim and Bhotan. *Thalictrum*, one species. *Anemone vitifolia*, *Fumaria*, two *Viola*, *Stillaria*, *Hypericum*, *Geranium* 2 species, 2 Balsams. *Epilobium*, *Potentilla*, *Paris* (7—10,000 ft.) *Panax pseudoginseng*, and another species, *Meconopsis Nepalensis*, 2 species of *Gen-*

\* I have now upwards of 20 distinct species of this superb genus from the Sikkim mountains alone.

† The red bark of the Yew is used as a dye and for staining the foreheads of the brahman Ghorkkas in Nepal.

‡ This is the only species of rose occurring in Sikkim below 10,000 ft.

§ Probably Bikh is yielded by various *Aconita*. The name of both the Sikkim Aconites is Bikh-gniong by Lepchas and Bhotheas, who do not distinguish the two species by the roots. Another, far more powerful Bikh, is yielded by a plant of the order *Compositæ*, which I have gathered abundantly at 10 and 9000 ft. and it requires care to distinguish its root from that of the Aconites; when mixed the Bhotheas could not separate them.

*tiana* and 2 *Crawfurdia*, 2 *Arisaema*, *Anagallis*, *Ardrosael* and *Ajuga*, *Disporum*, and three *Comallaria*, one with verticillate leaves, whose root is another "Bikh," and considered very virulent. *Graminæ* were very few in number, but a large *Carex* covered the ground, amongst the bamboo.

Still the absence or rarity of several very large natural families at this elevation, which have numerous representatives at and much below the same level in the Western Himalaya, indicates a certain peculiarity in Sikkim. These are the following :—*Ranunculaceæ*, *Fumariæ*, *Cruciferaæ*, *Alsineæ*, *Geraniæ*, *Leguminosæ*, *Potentilla*, *Rosa*, *Epilobium*, *Crassullaceæ*, *Saxifrageæ*, *Umbelliferaæ*, *Lonicera*, *Valerianeæ*, *Dipsaceæ*, various genera of *Compositæ*, *Campanulaceæ*, *Lobeliaceæ*, *Gentianæ*, *Boraginææ*, *Scrophularinææ*, *Primulaceæ*, *Gramineæ*.

All the above are genera of the north temperate and subarctic zones, which seek a much higher level in Sikkim than in the Western Himalaya or Bhotan. The difference in this respect being very much greater than the small disparity of latitude, will account for, or than any (if there be any) difference of mean temperature, for the snow line is certainly very little different here, from that of the N. W. Himalaya. On the other hand, certain tropical genera are more abundant in the temperate zone of the Sikkim mountains, and ascend much higher there, than in the Western Himalaya. Of this fact I have cited conspicuous examples in the palms, plantains and tree fern ascending to nearly 7000, and in the presence of many other orders at great elevations, figs, peppers, *Lauri*, &c. ; and to these could be added many others, none more remarkable than *Balanophora*, of which there are several species above 4, and even 6000 ft. one ascending to 8000.

This ascent and prevalence of tropical species, is due to the uniform humidity and the equability of the climate in this temperate zone, and is perhaps the direct consequence of these conditions. An application of the same laws accounts for the extension of similar features (tropical) of vegetation so far beyond the tropical limit in the southern ocean; where various natural orders which do not cross the 30th and 40th parallel of N. Latitude, are extended to the 40th, 50th and 60th in Tasmania, New Zealand, the so-called Antarctic Islands south of that group; and to Cape Horn itself in Fuegia.

The forest region, encroaching so far upon, and in fact covering the

temperate zone of the Sikkim Himalaya, and the snow level not being proportionally higher, it follows that, *cæteris paribus*, the belt occupied by upland alpine and the Arctic species, is more confined, and in all probability less prolific in species than it is in the N. W. Of this the rarity of Pines (themselves indices of a severe drought in the air or soil) would appear to afford a proof; for between the level 2500, the upper limit of the *P. longifolia*, and the *Taxus*, 10,000, which also coincides with the lower limit of *Abies*, there is no coniferous tree whatever in Sikkim; except perhaps in the mountain faces immediately subtending the perpetual snow; and there they may descend 1000 ft. lower. There are only 6 species of *Coniferæ*, including *Taxus* and *Juniperus* in Sikkim, of which two are not common to the N. W. mountains, and these six are by no means abundant in individuals; I shall however soon have the honor of laying before the Society, a short sketch of the limits of these, and shall therefore suppress further details here.

We encamped amongst the *Rhododendron* trees, on a spongy soil, of black vegetable matter, so oozy that it was difficult to keep dry-shod. The rain poured in torrents all the evening and thus, the calm, and wetness of the wood prevented our enjoying a fire. Except a transient view into the Nepal, a few miles west of us, nothing was to be seen, the whole mountain being wrapped in dense masses of vapor. Gusts of wind, not felt in the forest, swept over the gnarled and naked tree tops, and though the temperature was 50° this produced cold to the feelings in walking about, and exposure to it.

Our poor Lepchas were miserably off, but always happy under four posts and a bamboo-leaf thatch, and with no covering but thin single cotton garment. They crouched on the sodden turf joking with the Hindus of our party, who, though supplied with good clothing and shelter, were doleful companions.

I made a shed for my instruments under a tree; Barnes ever active and ready, floored the tent with logs of wood, and I laid a "corduroy road" of the same to my little observatory.

During the night the rain did not abate; the tent-roof bagged and leaked in torrents, so that we had to throw pieces of wax-cloth over our shoulders as we lay in bed.

*May 22nd.*—There is no improvement whatever in the weather. Two of the Hindus crawled into the tent during the night, with fever and

ague.\* The tent being too sodden to carry, we had no choice but to remain where we were, and there being abundance of novelty within 20 yards of the tent, there was no difficulty, with such a pursuit as Botany, in getting through the day. Observing the track of sheep we sent two Lepchas on the scent, who after being absent the whole day, returned from some miles west in Nepal, with two sheep and as many lambs. The shepherds were Goorongs of Nepal, who were grazing their flocks on a grassy mountain top, from which the woods had been cleared; probably by fire. These to the Lepchas was a great boon, but the Hindus would not touch the flesh, and several more sickening during the day, we had the tent most uncomfortably full.†

Our inability to obtain a view was extremely disheartening, the mountain commanding a superb prospect. It embraces nearly 100 miles of the snowy range, from far west in Nepal, to Kunchinjinga and its five sister-peaks, varying from 20,000 to 28,000 ft., and from which an unintercepted succession of snowy ridges sweeps round to east. The culminant points of this rise several to 21,000, and many to upwards of 18,000 ft. Chamalari, on the Thibetan plain, rears its head above the eastern amphitheatre of snows, at a distance of 80 miles. S. E. are the sub-Himalayas of Bhootan, and all between the billowy mountain masses of Sikkim. South, the eye should have ranged over the plains of India, the courses of the Teesta, the Konki, the Cosi, and the innumerable smaller streams which debouche on the plain.

During the whole of the 22nd, from 7 A. M. to 11 P. M., the Thermometer never varied 6° 5 degrees, ranging from 47.5 in the morning to 54°, its maximum, at 1 P. M., and 50.7 at night. At 7 the following morning it was the same. A Thermometer sunk 2 ft. 6 inches in deep vegetable mould and clay, maintained for two days the constant

\* It is a remarkable fact, that both the natives of the plains under many circumstances, and the Lepchas, when suffering from protracted cold and wet, take fever and ague in sharp attacks. The disease is wholly unknown amongst Europeans residing above 4000 ft., similar exposure in whom, brings on rheumatism and cold, even in constitutions predisposed to the former, by repeated attacks of fevers in other climates.

† This was a most convenient hill tent, kindly lent us by Major Cromelin of Darjiling; it goes on one man's shoulders, and accommodates two persons with a little management.



temperature of 50.7. In spite of the heavy rain and fog the dew point was always below the temperature, with which I am somewhat surprized, for more drenching weather could not well be. The mean dew point was 50.3, and consequent humidity 0.973.\*

These observations, and those of the Barometer, were taken some 60 feet below the summit, to which I moved the instruments on the morning of the 28th. At a much more exposed spot, the results would have differed no doubt. A Thermometer then sunk to the same depth as that below, stood at 49.7; or one degree colder than 60 ft. lower down.

The summit of Tonglo, by my Barometrical observations, taken simultaneously with those of Calcutta, gives the height 10,078.3 ft. Col. Waugh's, by Trigonometry, 10,079.4 ft., a marvellous instance of the perfection to which these instruments are brought, and above all of the accuracy of the tables† from which the altitudes are deduced. I hope shortly to have the honor of laying before the Society some proofs of the accuracy with which elevations by the Barometer may be obtained, together with some account of the most recent tables now in use, and which are no less remarkable for their comprehensiveness than simplicity.

*May 23rd.*—We spent a few hours of alternate fog and sunshine on the top of the mountain, vainly hoping for the most modest view. The air, which was always foggy, was alternately cooled and heated, as it blew over the trees, or the open space we occupied, sometimes varying 5° and 6° in  $\frac{1}{4}$  hour. Whenever a lull occurred the fog was sensibly heated by the sun's rays.

The number of mosses, *Hepaticæ* and *Lichens*, growing near and on the summit, is very remarkable. There were various species of Ferns, and a small *Agaricus* grew on decayed twigs; Lichens infested the naked branches of the Rose, Barberry and Cherry. The trunks of both the *Rhododendrons*, owing to their smooth papery bark, and the bamboo, are remarkably free from Cryptogamic vegetation.

Having partially dried the tent in the wind, we commenced the

\* As expressed by the quotient of the tension at the temperature of the dew point divided by that of the air.

† There are Bessel's Tables, translated by Col. Sabine, and published in the — number of Taylor's Scientific Memoirs.

descent, which owing to the late torrents of rain, was most fatiguing and slippery ; it again commenced to drizzle at noon, nor was it till we had descended to 6000 feet, that we emerged from the region of clouds. Then I met with a species of *Balanophora*, pushing through the soil ; it is a new species, monoicous, the earliest flowering of any in Sikkim, and may be distinguished from its congeners by its cyathiform involucre round the middle of the pedicel.

By dark we arrived at Simonbong, having descended 5000 feet at the rate of 1000 feet an hour, and here we were kindly received by the Lama, who gave us his temple for the accommodation of the whole party. We were surprised at this, both because the Sikkim authorities had falsely represented the Lamas as very averse to Europeans, and because he might well have hesitated, before giving ingress to a promiscuous horde of some 30 people, into a sacred building, when the little valuables on the altar, &c. were quite at our disposal. He made but one request, that the Hindus should not smoke their hookahs inside.

Simonbong is one of the smallest and poorest Gumpas (or monasteries) in Sikkim,\* unlike the better class, it is built of wooden beams only, and has no monuments, except the Chaits mentioned on our way up the mountain. It consists of one large room, with small sliding shutter-windows, raised on a stone foundation, and roofed with shingles of wood ; opposite the door, which is at one end, (the east,) the altar is placed, of wood, chequered with black white and red diagonally ; to the right and left are shelves with a few MS. books, wrapped in silk ; a model of Symbonath at Nepal, in wood ; a praying cylinder, and some implements for common purposes, bags of Juniper, &c. On the shelves are English wine bottles and glasses, with tufts of *Abies Webbiana*, *Rhododendrons* and peacocks' feathers.

On the altar seven little brass cups are ranged, full of water ; a large shell carved with the sacred lotus ; a brass jug from Lhasa, of beautiful

\* There are upwards of 20 Lama establishments in Sikkim, numbering 800 monks. Many of these are of excellent masonry, Chinese in architecture, gorgeously decorated, and for so poor a country, richly endowed. During my more recent travels in Sikkim I have visited many, been an inmate in the monasteries, and met with the greatest kindness and hospitality from the good fathers. As the first European who has ever lived with the monks, this was the less to be expected. Dr. Campbell, who afterwards joined me, and whose delightful society I visited others, records the same opinion of these good-humored people.

design, and a human thigh bone, hollow and perforated through both condyles. The shelves above contained various trifles, clay ornaments and offerings, and little Hindu idols brought from the Hurdwar fair.

Facing the altar is a bench and chair, and on one side a huge tambourine, with two carved iron drum sticks. The bench was full of mysterious implements, bells handsomely carved with idols, censers with juniper ashes, the dorge which the priest holds in his hand during service, and various water vessels; on the stool or chair was a large platter, with a brass egg-cup inserted in it.

Of these the human thigh-bone is by much the most curious; it is very often that of a Lama, and the longer they are the more value is put upon them. As however the Sikkim Lamas are burned, these relics are generally procured from Thibet, where the corpses are said to be cut in pieces and thrown to the kites, or into the water.

The Lama was consecrated at Chungachelling, one of the oldest Sikkim convents (three centuries) and unfortunately was not an educated or intelligent fellow.

Two boys usually reside in the temple, and their beds were given up to us, which being only rough planks laid on the floor, proved clean in one sense; but contrasted badly with the springy couch of bamboo the Lepcha makes in your tent, and which renders carrying a matress or aught but blankets superfluous.

*May 24th.*—We were awakened this morning by the discordant orisons of the Lama, these commenced at sunrise by the boys coming in and beating the great tambourine close to our ears for several minutes; then blowing the conch shells, and finally the thigh-bone, each as long. Shortly the Lama entered, clad in scarlet, shorn and barefooted, with a small red silk cap. He walked along, slowly muttering and groaning his prayer to the end of the apartment, whence he took a small red bag in which were a brass bell and dorge. Sitting down he commenced matins before the chair with the brass cup, which he filled with water and placed again in the platter,—took off his beads and continued counting them or beating the bell, uttering most dismal prayers in a very deprecatory tone, of which “*Maliva oh Maliva,*” was the burthen. After various disposals of the water-jugs, cups and platter, which were filled and refilled, rice added and sprinkled about,—a large bell was violently rung for some minutes, himself snapping his fingers and uttering most



unearthly sounds. Having put away those instruments, incense was brought, of charcoal with juniper sprigs. This was muffled about, and put through many evolutions, and finally, with the water, thrown out of the window, when to our great relief the morning service was concluded, for the noises were quite intolerable.

After breakfast the Lama came to visit us, bringing rice, a few vegetables, and a large basket of fermented Murwa; the latter is invariably given to the traveller, either in the state of the fermented grain, or more commonly in a bamboo jug filled right up with warm water and grain; the fluid sucked through a reed is a refreshing drink.

A species of *Ptris* at Simonbong (which is very common elsewhere in Sikkim,) attains a height of 14 feet, as great as I ever remember having seen itself or congeners in New Zealand.

Leaving Simonbong, we descended to the little Rungeet, and crossed it lower down than before, thus avoiding some troublesome spurs; the heat of the valleys is very great, 80° at noon, and of the stream 69°; the latter an agreeable temperature for the coolies, who plunged teeming with perspiration into the water, catching fish with their hands.

We reached Darjiling late in the evening, and again drenched with rain, our people, Hindus and Lepchas, imprudently tarried for the night in the valleys below. Owing probably as much to the great exposure they had lately gone through and the sudden transition from a mean temperature of 50° in a bracing wind, to a hot close jungly valley at 75°, no less than seven were laid up with fever and ague.

Few excursions from Darjiling can, for their length, give a better idea of the general features and rich luxuriance of the Sikkim sub-Himalaya than one to Tonglo. I was amply rewarded, and my ever cheerful and active companion, pronounced himself so too, though we both had fully expected better weather, and some, however transient or confined, a prospect. It is always interesting to roam with an aboriginal, and especially a mountain people, though their thinly inhabited valleys, over these grand mountains, and to dwell alone with them in these forests, however gloomy and forbidding. No thinking man can do so without learning much, though slender be the resources at his command for communion. A more interesting and attractive companion in this respect than the Lepcha, I never lived with; cheerful, kind and patient with a master he is attached to: rude but not savage, ignorant



and yet intelligent ; with the simple resource of a plain knife, he makes his house and furnishes your's, with a speed, alacrity and ingenuity that steals away that well known long hour, when the weary pilgrim frets for his couch. In all my dealings with them they have proved scrupulously honest. Except for drunkenness and carelessness, I never had to complain of any of the merry troop, some of whom, bare-headed and bare-legged, with *absolutely* nothing but a cotton garment and long knife, followed me for 3 months (on a recent occasion, from the scorching plains to the everlasting snows ; ) ever foremost in the forest or bleak mountain, and ever ready to help, to carry, to encamp, collect, or cook, they cheer on the traveller by their unostentatious zeal in his service ; and are spurs to his progress, for who would not go forwards where such followers are behind.

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*The Polecat of Tibet, n. s. By B. H. HODGSON, Esq.*  
*With a Plate.*

Every addition to the Mammalogy of Tibet is of high interest from the light it is calculated to reflect upon those very subtly varying circumstances which determine parity of climate in relation to organic development and distribution ; and I have therefore much satisfaction in presenting to the Society the following description of a new species of Weasel, bearing nearly the same remarkable resemblance to the ordinary Polecat of England as do the Raven, Magpie, Chough and Nutcracker of Tibet to those of our own country. Ere long, when the results of the recent scientific expedition to Gnári shall have been placed before the public, the mean elevation and temperature, the moisture and the soil of the Western Province of the great transnivean plateau will, it is hoped, no longer remain matters of speculation and doubt. But we possess not, nor have any prospect of soon obtaining, similar data in reference to the central province of U'tsáng, or to the eastern province of Khám. Humboldt has, indeed, assigned 10,000 French feet for the

*Corrections to Mr. HODGSON's paper on the Polecat of Thibet.*

Page 446, *last* line, for 10,000, *read*, 9000.

„ 447, *first* line, for inferentially only, *read*, the environs of  
Lassa are comparatively low, *vide* M. Huc's narrative An.  
Propag. pp. 236-7.

„ 447, line 6 from top, for nearer 15,000 feet, *read*, at least 3  
to 4000 feet above Humboldt's estimate above cited,

„ 447, 8 lines from bottom, for 16,642, *read*, 16,700.

„ 447, 7 lines from bottom, for 15,746, *read*, 17,500.

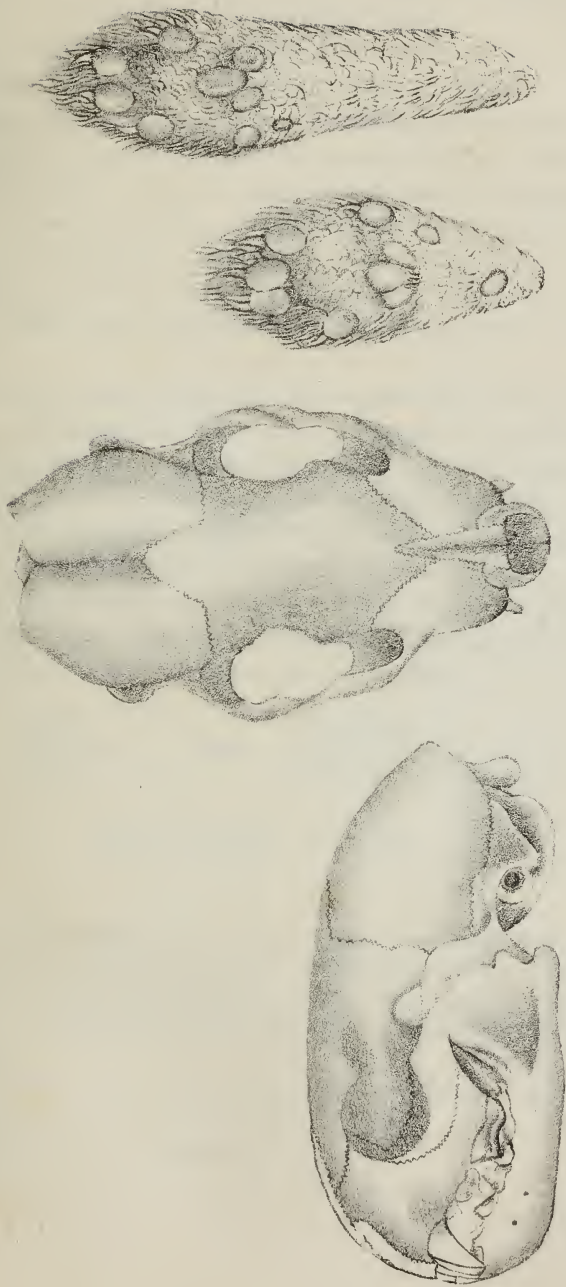




THE POLECAT OF TIBET.









elevation of Lassa, but inferentially only; and it is difficult to advert to what we now know of the surpassing elevation of the Himálayan peaks and gháts opposite to U'tsáng,\* in connection with what is credibly alleged of the very trivial descent from those gháts† to the plain of U'tsáng, without coming to the conclusion that the mean height of the central province of Tibet must be nearer 15,000 feet. On the other hand, the received ratio of decrement of heat with increasing elevation‡ would, on such a supposition, reduce the temperature of U'tsáng to an arctic rigour inconsistent with much that is alleged of the vegetable productions of that province, and with much that is known of its wild animals, among which antelopes and large felines make a conspicuous figure.

The whole of my quadrupeds and birds of Tibet were procured in U'tsáng. Amongst the latter I have just adverted to four species, than which none are more common in, and characteristic of, Britain at once and Tibet. Nearly the same thing may be said of that singular Tibetan analogue of our familiar English Polecat, which I am now about to describe, merely observing in the meanwhile that a Boreal, though not a strictly British character, is strongly impressed upon the general contents of my Tibetan Catalogue and upon the additions since made to it, as recorded in the Journal between 1843 and 1848.

Felidæ.	}	Gray.	{	Carnivora.	}	Waterh.
Mustelina.				Mustelidæ.		
Putorius.				Mustela.		

Putorius Larvatus.	}	n. s.
Mustela Larvata.		

\* Peak of Kángcháng 28,176. Ghát of Wallúngchúng 16,642. Ghát of Kánglachéma 15,746, the former determined by Col. Waugh, the latter by Dr. Hooker. Peak of Dhavalagiri 27,000, (Herbert.) Of Chumalári, 24,000, (Waugh.) To all which add Deodhúnga, a peak which (as well as Dhavalagiri) is believed to rival Kángcháng.

† Journal, No. 197, pp. 495 and 499, and 499, and Turner's Tibet, at entrance into Tibet.

‡ Herbert's Report on Darjiling, p. 3.



*Black-faced Polecat of Tibet.*

Tail one-third of the entire length. Soles clad. Fur long. Above and laterally, sordid fulvous, deeply shaded on the back with black. Below, from throat backwards with the whole limbs and tail, black. Head pale with a dark mask over the face. Snout to vent 14 inches. Head less 3. Tail only 6. Tail with hair, 7. Palma  $1\frac{3}{4}$ . Planta  $2\frac{3}{8}$ .

Habitat, the plain of central Tibet.

My specimen of this interesting animal was obtained in the district of U', on the south of the Sápú, and was brought to me this spring along with a second specimen of the Tibetan Badger (*Taxidea Leucurus*.) The skin was in good condition, and had the limbs and skull complete. It is seemingly a male, and certainly, a mature animal. The length from snout to vent is 14 inches and the tail is 7 more, so that *Toufæus* only of Tibet, and *Flavigula* of the Himálaya, can compare with it in size. The copious pelage more resembles that of the Yellow-neck of these mountains than that of the Sable-like Tibetan species. The fur is of two kinds, or hair and wool, both abundant, especially the wool; and the hair is as much longer than the wool as it is less thick. The structure of the animal is typical. The face short and bluff, the head long and depressed ovoid, the neck of medial length, and as thick as the head, the body very long, the tail longish and cylindrico-tapered; the ears, as usual, remote, truncately rounded and fissured behind; the limbs short and strong, the fore digits being rather the larger, and the hind limbs more plainly the longer, of the two. The soles of the feet, fore and aft, are completely furred, save only the digital balls and a very small carpal one; and this would seem to be the case with most of the mustelines, our *Cáthia* and the Javanese nudipes appearing to be quite exceptional in regard to the nakedness of the soles of their feet. The digits of the Tibetan Polecat are andromorphously gradated upon the whole; but the two central fingers are more nearly equal than in the human hand, and the inner digit or thumb is small and remote, as usual with the congeners of this species. The nails, by their length and acuteness, indicate scansorial habits more proper to the Martens than to the Weasels, strictly so called, though the number and character of the molar teeth leave no doubt that our animal belongs to the latter division. The ample pelage has the hairy piles  $2\frac{1}{4}$  to  $2\frac{3}{4}$  inches long upon

the body. Upon the tail they are shorter, and tend to a point at its extremity, where however they do not much surpass the true tail, less so than in the English Polecat. Upon the head and limbs the hair is short, harsh and void of woolly subfleece. Elsewhere the hair is long, fine, straight, elastic, glossy, but much scantier than the very thick, soft woolly piles below it. The colour of the animal is a sordid fulvous, deeply shaded with black. The limbs and tail are wholly black, and so is the whole under surface of the body, save a narrow band proceeding from the fulvous flanks round the centre of the belly. A black mask covers the face, as far as the eyes, inclusive, and the nostrils exclusive. And this dark mask is rendered more conspicuous by being completely surrounded by the pale fulvous hue, which prevails over the lips, chin, cheeks, ears and crown of the head. The dimensions of the animal and of its skull are given in detail below. But I may here add in reference to the skull that it has greater height and greater arcuation along the culmen line than in most other true weasels, the English Polecat perhaps included. The teeth are  $\frac{6}{6}$ .  $\frac{1}{1}$ .  $\frac{7}{1}$ .  $\frac{4}{5}$ .  $\frac{4}{5}$ . The incisors above are disposed in line; but below, the intermediate teeth stand interiorly to the rest. The canines are large and somewhat curved, especially the lower ones, which however have no heel at their base. The first molar above is simple, conic and small. The next also conic, is larger with a quasi heel before and behind the cone. The third or carnassial tooth has two cutting, compressed lobes and a small internal heel placed antea. The 4th or tubercular molar of this jaw, is transversely set, parallelogramic in form, and shows two blunt and rugged conic processes centrally divided by a transverse dip. In the lower jaw the three first molars are conic and uncompressed with more or less of heel before and behind the central lobe of their crowns. The 4th or true carnassier is, in this jaw, very trenchant, and much compressed, with three lobes, of which the hindmost is the least. This tooth has no trace of an internal heel, but its postea lobe assimilates somewhat with the tubercular of this jaw, which is a small round flat-topped tooth fitted for crushing only. The excellent drawings appended to the above description will, I hope, complete whatever more is needful to an accurate appreciation of the species.

*Dimensions of the Animal.*

Snout to vent, .....	1	2	0
Head, less, .....	0	3	0
Tail and hair, .....	0	7	0
Tail only, .....	0	6	0
Palma, with nails,.....	0	1	$\frac{3}{4}$
Planta, with nails,.....	0	2	$\frac{3}{8}$

*Dimensions of the skull.*

Length, .....	0	2	$\frac{5}{8}$
Height, .....	0	1	$\frac{3}{8}$
Width between zyg. arches, .....	0	1	$\frac{5}{8}$
Width between bases of parietes, .....	0	1	$\frac{2}{8}$
Length of upper jaw, symp., intermax to hind edge of last molar, .....	0	1	0
Length of lower jaw to last molar, .....	0	1	$\frac{1}{16}$

P. S.—The following enumeration of the Mustelidæ of Tibet and the Himálaya may be serviceable:—

1. *Martes Toufous*.
2. *Martes Flavigula*.
3. *Mustela Erminia*.
4. *Mustela Canigula*. *Hodgsonii* of Gray.
5. *Mustela subhemáchalana*. *Humeralis* of Blyth.
6. *Mustela Cáthia vel auriventer*.
7. *Puttorius larvatus*.

1, 3 and 7 are confined to Tibet. The rest are Cisnivean, but belong in general, exclusively to the northern region of these mountains; 5 and 6 however are also found in the central region, and 2 is almost confined to that region. None are found in the southern region.

*On the Aborigines of Nor-Eastern India. By B. H. HODGSON, Esq.*

Pursuant to my plan of furnishing to the readers of the Journal a glance at the Ethnic affinities of the Aborigines of India, from the snows to Cape Comorin, I have now the honor to submit a comparative vocabulary, uniform with its precursors, of the Dhimál, Bódó and Gáró tongues, preceded by the written and spoken Tibetan, for a reason that will presently appear.

I regret that I could not on a recent occasion, nor can now, give the Chépáng vocables on this model. But it is many years since I have had access to that secluded people, and I cannot now calculate on having it again.

As I have already, in a separate work, given the Dhimál and Bódó languages upon a scale much ampler than the present one, and as I have, moreover, in that work demurred to the sufficiency of summary vocabularies, it may be asked why I repeat, myself, on the present occasion, and in the very manner I have myself objected to? My answer to this question is ready, and I hope will prove satisfactory. Three years have now elapsed since I published the work alluded to, and in that time I have had ample opportunity to observe the general indisposition to enter the field of Indian Ethnology, bent upon serious labour like the author of that work. Now, general co-operation is the one thing needful in this case: and, since I feel certain that there is no want of mental vigour in this land, I am led to ascribe the slackness I have experienced in obtaining co-operators according to the suggested model, to the novelty of the subject, whence it happens that few persons can perceive the extensive bearings and high interest of that subject.

By the present series of summary vocabularies I hope to make these points apparent, when I confidently anticipate that many able men who could not be won to give their time and attention to the elucidation of the barbarous jargon of this or that insulated and petty tribe of aborigines, will yet be stimulated to efficient exertion upon being made aware that the question, in fact, relates to the fate and fortunes, the migrations and improvement or deterioration, of the largest family of human kind. No question of ethnology is insulated. It is quite the contrary, and that by its very nature. So that wherever we begin,



even with the humblest tribe, we must soon find that we are dealing with the history, and with a material portion of the history, of some great mass of the human race. Thus, the latest investigators of the general subject of human affinities include in the great Mongolian family, not merely the high Asian Nomades, or the Túrks, the Mongols and the Tangús, but also (with daily increasing, though not yet conclusive, evidence) the Tibetans, the Chinese, the Indo-Chinese, and the Tamúlians. The Tamúlians include the whole of the Aborigines of India, whether civilized or uncivilized, from Cape Comorin to the snows ; except the inhabitants of the great mountainous belt confining the plains of India towards Tibet, China and Ava. These last are, in the Nor-West, derived from the Tibetan stock ; and in the South-East, from the Indo-Chinese stock ; the 92° of East longitude, or the Dhansri river of Assam, apparently forming the dividing line of the two races, which are each vastly numerous and strikingly diversified, yet essentially one, just as are the no less numerous and varied races of the single Tamúlian stock. Thus, we cannot take up the investigation of a narrow and barren topic like that of the Kúkí, the Chépáng, or the Gónd tribe without presently finding ourselves engaged in unravelling some, it may be, dark and intricate, but truly important, chapter of the history of one of those large masses of human kind, the Indo-Chinese the Tibetans, or the Tamúlians. Nor can one prosecute this investigation far without perceiving that our subject has yet ampler relations, connecting itself by indissoluble yet varied links with those tremendous warriors who planted their standards on the walls of Pekin and Dehli, of Vienna and Moscow. Much of their fate and fortunes belongs to history, but much more to pre-historic times, when vast bodies of these so called Mongols poured themselves upon India, from the North and from the East, both before, and subsequent to, the great immigration of the Arian Hindús. Have you no curiosity to learn what may be learnt anent these important, and for us British denizens of India, domestic, events ? Or do you doubt the validity of any available media of proof ? If the latter, as is probable, be the ground of your objection to such inquiries, I would say, in the first place, look steadfastly at any man of an aboriginal race (an ubiquitous Dhánger for instance) and say if a Mongol origin is not palpably inscribed on his face ? Or, again, take a score of words of his language and compare them with their equi-

valents in Hindí, Úrdú, or any other Prakrit, and say if you are not sensible of being in a foreign realm of speech? And what can that realm be but the North and Nor-East, the Nor-West being no way available to your purpose? In the second place I would observe that every medium of proof which has been employed to demonstrate the unity of the Iranian family is available to demonstrate the unity of the Turanian; whilst, with regard to *prima facie* improbabilities, much greater ones once encompassed the now admitted fact that Hindús, Persians, Germans, English, Irish, Russians, are members of one family, viz. the Iranian, than can attend any similarly perfect demonstration, that Tamulians, Tibetans, Indo-Chinese, Chinese, Tangús, Mongols and Túrks are so many branches of another single family, viz. the Turanian. Nor are these questions of interest only to the speculative philosopher. They are, on the contrary, of vital importance to the Statesman who may be led into the most serious practical errors for want of such lights as Ethnology affords. I will give a striking and recent instance. The Chief Secretary of the Government, who is likewise one of the most able and accomplished men in India, in speaking of the educational improveability of the Hindús, has formally alleged the *impossibility* of making them worthy and vigorous men and citizens by reason of their race,\* when it is really as certain as that 2 and 2 make 4, that the race of the Hindús is identical with Mr. Elliot's own! Glottology and Anatomy combine to place this great truth (and in every educational view it is pre-eminently such for all those who are now seeking to make this splendid country capable of adequate British, and eventually in the fullness of time of self-government) upon an unshakeable foundation. Would that the science of Law, national and international, stood upon an equally stable basis of numerous, largely and irrefragably inducted facts.

Having said so much by way of encouragement, upon the extensive bearings and high importance of Indian Ethnology, I will now add a few words by way of caution. Mr. Robinson, in a recent paper upon sundry of the border tribes of Assam,† has not scrupled confidently to

\* Preface to the Moslem Historians of India. I cordially assent nevertheless to the justice of Mr. Elliot's strictures. But I find the cause of the actual evil elsewhere.

† Journal, No. 201, for March 1849.

assert the affinity of these tribes (the Bodo and Gárá amongst others) with the people of Tibet. This may, or may not, be so. But I apprehend that this alleged affinity demands larger and more careful investigation than Mr. Robinson has yet had leisure to apply to it, and that in thus deciding upon a most interesting and difficult point, he has adduced maxims which are not very tenable. In the first place, he has wholly neglected the physical and psychical evidence which are, each of them, as important as the glottological towards the just decision of a question of ethnic affinity. In the next place, whilst adducing a copious vocabulary which makes against, and a curt survey of the mechanism of language which (we will allow) makes for, his assertion, he proceeds to lay down the doctrine that the former medium of proof is worthy of very little, and the latter medium of proof (thus imperfectly used and applied) is worthy of very much, reliance. In the third place, whilst insisting upon the indispensableness of a written and fixed standard of speech, he has neglected the excellent standard that was available for the Tibetan tongue, and has proceeded to rest upon two spoken standards, termed by him Bhotia and Chángló, but neither of which agrees with the written or spoken language of Lassa and Digarchi. In the fourth place, he speaks of Bhót alias Tibet, and Bhútán alias Lhó, as the same country; and also gives his unknown Changlo a position within the known limits of Bhútán,\* without the slightest reference to the latter well-known country; besides, speaking of the cis-Himálays and sub-Himálays (p. 203) as separate races!

These remarks are by no means captiously made. But some sifting of the evidence adduced is surely indispensable when a question of delicacy and difficulty is (I must think) prejudged upon such grounds.

Mr. Robinson is possibly not aware how much of the mechanism of the whole of the Turanian group of languages is common to every one language of that group, nor that the Tamulian and Tibetan languages are held to be integral parts of that group. Yet such are apparently the facts,† whence it must surely result that a cursory and exclusive view of the organization of one of these languages, such as Mr. Robinson gives and rests on, cannot be adequate to settle the Tibetan affinities of the Bódós and Gárós (interalia), since the points of lingual

\* Viz.  $92\frac{1}{4}$  East longitude.—*Pemberton's Report*.

† Prichard, Vol. IV. p.—, and Bunsen's Report.



agreement cited may be neutral quantities, that is, characteristics common (say) to the Tamulian and Tibetan tongues, or to the Chinese and Tibetan : and certainly some of them are so far from being diagnostically, that is, exclusively, Tibetan, that they belong to Hindi, Urdú and even to English ! We have yet much to learn touching the essentials of the structure of the Indo-Chinese tongues, the Chinese and the Tibetan ; and until a philosophical analysis shall have been made of these languages it will be very hazardous to rest upon a cursory view of the supposed distinctive (structural) characters of Mr. Robinson's exclusive standard, or the Tibetan ; in regard to the structure of which tongue, moreover, he has scarcely more fully availed himself of De Cörös' grammar than he has in his vocabulary of De Cörös' dictionary. Under these circumstances I am disposed to place at least as much reliance upon Mr. Robinson's copious list of vocables\* as I can do upon his incomplete analysis of structure ; and with regard to Mr. R.'s disparagement of the words of any unwritten and uncultivated tongue as evidence of ethnic affinity, I must say there seems to me a good deal of exaggeration.†

Whoever shall take an adequate number, not more than Mr. Robinson's, of well selected words, and shall take them with such care as to be able to reach the roots of the words and to cast off those servile particles, whether prefixes or postfixes, among which deviation is ever most rife, may confidently rely upon his vocabulary for much sound information respecting ethnic affinities, supposing of course that he has a good

\* This list seems to gainsay Mr. R.'s theory, for if the Bódós (for example) were of Tibetan origin, it is hardly credible that their ordinary vocables should not more plainly reveal the fact, seeing that they have never been out of actual contact with races of the same descent as that ascribed to them. The sub-Himálayan dialects differ from the trans-Himálayan standard : but identity is here shown in the roots as well as in the mode of agglutinating the servile particles ; not to mention that the snows form such a barrier in this case as exists not in regard to the Bódó intercourse with tribes of Tibetan origin.

The same general result follows from a careful examination of the vocabularies now forwarded. Apparently the Tibetan, like the Hindi, words, are adopted ones.

† Mr. Kemble has lately made most important use of the Saxon of the Hephtharchy, of its words, and words only, Saxons in England. A yet higher and strictly ethnological use has been made of the vocables of the old Iberian tongue, by the younger Humboldt, who was yet reduced to glean these vocables from maps ! What would not Bunsen give for 100 plain words of the old Egyptian tongue, as spoken.



standard and makes the proper use of it. Of course, I reject, with Mr. Robinson, as neutral quantities, all adopted, imitative and interjectional words. But when I find Mr. R. insisting upon "casual" resemblances as a class of words equally worthless with the three above enumerated, I desire to know what this chance means; for, one of the highest of living authorities on Ethnology and Glottology, and one too who insists almost too much upon the mechanism of language,\* declares that "the chance is less than one in a million for the same combination of sounds signifying the same precise object."† With these cautionary remarks, which are given in a spirit of perfect courtesy towards Mr. R. I now conclude, any further observations being unnecessary to explain my purpose in appending the written and spoken Tibetan, the former from De Cörös; the latter, from a native of Lassa, to my present series of vocables.

*Comparative Vocabulary of the Tibiten, Dhimál, Bódó and Gáro tongues.*

English.	Tibetan.		Dhimál	Bódó.	Gáro.
	Written.	Spoken.			
Air	rSúngma	Shákpá	Birima Bhirma	Bár H	Lampár
Ant	Grogma	Thómá	Nhá múi	Hásá brai	Góngá, Sám búr
Arrow	mDáh	Da	Khér	Balá	Phéé
Bird	Byú	Chyá	Jihá	Dou-chen	Tou-chap
Blood	Khráng	Thák	Hiki	Thóí	Chí
Boat	Grú	Koá, Syén	Náwár H	Nou H	Rúng
Bone	Rúspa	Rúkó	Hará H	Bégéng	Kéréng
Buffalo	Mahí. s.	Máhé	Díá	Moisho	Moishí
Cat	Byila	Simi	Mén khou	Mouji	Myou
Cow	Bá	Phá chúk	Piá	Mash-hú-jo	Máshú
Crow	Kháta	Ablak	Kawá	Dou-khá	Koura
Day	Nyinmo	Nyi mo	Nyi tima T	Shyán	Rasán, Sán
Dog	Khyi	Uyó	Khíá T	Choí má	Kai T
Ear	Sá	Amchó	Nhá tóng	Khoma	Máchór
Earth	rNá	Sá	Bhónoí	Há	Há
Egg	sGóngá	Gong ná	Túi	Dou-doi, <i>(fowl's water)</i>	Tou-chí, <i>(fowl's blood)</i>
Elephant	gLángchén	Lámboché	Nária	Moi gédét	Nápló
Eye	Mig	Mik	Mí T	Mogon	Makar
Father	Phá	Pálá	Ábá	Bípha	Ábá
Fire	Má	Mé	Mé T	Wat	Ver, Wal
Fish	Nyá	Gná	Haiyá	Ná T	Ná T
Flower	Métog	Méntok	Lhép	Bíbar	Parr
Foot	rKángpá	Kángó	Khókóí	Yáphá	Chaplap

\* See Bopp's remarks on the structural diagnostics of Sanscrit and Arabic — *Comp. Gram.*

† Bunsen's Report to the Brit. Assoc.

English.	Tibetan.		Dhimál.	Bódó.	Gáro.
	Written.	Spoken.			
Goat	Rá	Rá	E'échá	Búrmá	Púrún
Hair	sKrá, sPú	Tá. Krá	Múi tú	Khanai, Kho- mon	Kaman, Houru
Hand	Lág pá	Lángó	Khúr	Akhai	Chákréng
Head	mGó	Gó	Púring	Khóró	Dakam
Hog	Phag	Phak	Páyá	Yóma	Vak
Horn	Rá	Rajo	Dáng	Góng	Korong
Horse	rTá	Tá	Onhyá	Kórai H	Ghora H
House	Khyim	Náng	Chá	Noö	Nagou
Iron	lChags	Chhyá	Chír	Chúrr	Shúrr
Leaf	Lómá	Hyómá	Lhává	Lai	Léchak
Light	Hod	Hwé. Eu	Sánéká	Chúráng, Shráng	Klángkláng
Man	Mi	Mi	Wával, Diáng	Híwá Mánshi*	Míva
Monkey	sPrébú	Tyú	Nhóyá	Mókhará	Kouwé
Moon	zLáva	Dáwá	Táli	Nókhábir	Ráng rét
Mother	Ama	Ámá	Amá	B má	Ama
Mountain	Rí	Rí	Rá T	Hájó	Há chúr
Mouth	Khá	Khá	Núi	Khouga	Hótóng
Moschito	Súnbú, mChurings	Syé dongma	Jáhá	Thámphói	Sotsá
Name	Ming	Ming	Ming T	Múng T	Múng T
Night	mTshanmo	Chénmó	Nhishing	Hór	Phar
Oil	hBrúmár	Num	Chúiti	Thou	Tél H
Plantain	Caret	Grálá	Yúmphí	Thálit	Laktai
River	gTsáng po	Cháng pó	Chí	Dói	Chí
Road	Lam	Lani	Dámá T	Lámá T	Lam T
Salt	Tshá	Chhá	Désé	Shyúng karé, Sayúng kri	Syang
Skin	Pág spa	Pág-pa	Dhálé	Bígúr	Holop
Sky	Nam kháh	Nam	Sórgi H	Nó khoráng	Sórg H
Snake	sBrúl	Deu	Púnhá	Jíbou	Dúpú
Star	sKarma	Karma	Phúró	Háthot khi	Laitan
Stone	rDó	Dó	Unthúr	Onthai	Lóng
Sun	Nyimá	Nyí má	Béla H	Shán	Sán, Rasán
Tiger	sTag	Tak	Khúná	Mochá	Matsá
Tooth	Só	Só	Sí tong	Hathai	Phá tóng
Tree	lJonshing	Shin dong	Shing T	Bong-pháng	Pan
Village	Yúl tsho	Thóng	Dérá H	Phará H	Sóng
Water	Chhú	Chhú	Chí T	Dói	Chí-ká T
Yam	Dóvá	Thó má	Ling	Thá	Han
I	Ná	Gnyá	Ká	Áng	Áng
Thou	Khyod	Khé	Ná	Náng	Náng
He, she, it	Kho	Khú	Wá	Bí	U
We	Nachag	Gnánjo	Kyel	Jong	Ning
Ye	Khyodchag.	Khenjo	Nyel	Nang chúr	Nanók
They	Khochag	Khonjo	Ubal	Bí chúr	O'nök, Wonók
Mine	Nahi. Nayi	Gná yi	Káng	Angni	Angni
Thine	Khoyod kyi	Khé yi	Náng	Nangni	Nangni
His, &c.	Khoyi, Khóhi	Khó yi	Wáng	Bíni	U'ni
Our's	Nachaggi	Gnánjo yi	King	Jong ni	Ning ni
Your's	Khyod, Changgi	Khenjo yi	Ning	Nang chúrni	Nanókni.

\* Diáng and Mánshi express mankind, met. F. Wával and Hiwá, man only.

English.	Tibetan.		Dhimál.	Bódó.	Gáro.
	Written.	Spoken.			
Their's	Khochaggi	Khonjo yi	U'bal ko	Bíchúrní	O'nôkni
One	gChig	Chik	E'-long	Man-ché T	Gó-shá
Two	gNyis	Nyi	Nhé-long T	Man-né T	Gi-ning, A-ning
Three	gSúm	Súm	Súm-lang	Man-tham	Ga-thám, A-thám
Four	bZhi	Zhyi	Diá-long T	Man-bré	Bri
Five	Hna	Gná	Ná-long T	Man-bá	Bóngá
Six	Drúk	Thú	Tú-long T	Man-dó	Krók T
Seven	bDún	Dún	Nhí-long	Man-chini	Sining
Eight	br Gyúd	Gyé	Yé-long	..	Chét
Nine	dGú	Gúh	Kúhá-long	..	Jú T
Ten	bChú,	Chúh	Té-long	..	Chí T
	Thámhá				
Twenty	Nyi shú	Nyi shú	E'long bísá	Chokai-bá Bi-sha-ché	Rúng shá*
Thirty	Súmchú	Súmchú	Caret	Caret	Rúng shá chi
Forty	bZhibchú	Hip chú	Nhé bísá	Bishá né	Rúng ning
Fifty	Hnabchú	Gnap chú	Caret	Caret	Rúng ning chi
Hundred	brGyátham-bá	Gyá, Gyá thambá	Ná bísá	Bishá bá	Rúng bóngá
Of	Kyi, Gi, Hi, Yi	Gi	Kó	Ní	Ní
To	Lá, Tú, Dú, Ra, Sú	Lá	E'ng	No	Ná
From	Nas, Las	Né, Diné	Shó	Phrá	Prá
By, inst.	Kyis, Gin S. His, Yis	I	Dóng, Ou	Jóng	Man
With, cum, Sáth in Hindi and Urdú	Lhanchig	Lá, Dá	Dópá, Dósá	Lago, Jong	Mon
Without, sine, Bina in Hindi	..	Thána	Mánthú	O'ngá, Géyá	Tóng chani ga-mang
In, On	Lá, Ná	Lá	Rhútá	Chon, Nou, Ou	Púm vai, Pir vai
Now	Déngtsé, Dég	Thándá	E'lang	Dánó	Tayan
Then	Dé tsé	Thi dwi	Kólá	Obéla H	Té éng
When ?	Gang tsé, Nam	Khádwí	Hélou	Mábéla	Bíba
To-day	Déring	Thíring	Náni	Diné H	Tingní
To-morrow	Sáng, Thoré	Sáng	Júmni	Gábún	Ganáp
Yesterday	mDáng	Dáng	Anji	Mía	Mí vai
Here	Hadina	Dicho	I'sho	Imbo	Yayan
There	Héna	Hácho	U'sho	Hobo	Wáng
Where ?	Gangna	Khacho	Hésho	Mouha	Bié
Above	sTengna	Teng, Ghe yégi	Rhútá	Chhá	Pír vai
Below	Hogna	Wó, Syú, Magi	Létá	Syng	Chúrik vai

\* Bísá, Bishá vel Rúng is a score, and the system of enumeration is one score, one score and ten, two score and so on to 5 score for 100.

Cho kai ba in the Bódó column is 5 groats or Gandas for 20.

English.	Tibetan.		Dhimál.	Bódó.	Gáro.
	Written.	Spoken.			
Between	Bar, du	Bhar	Májhata H	Géjér	Majár vai H
Without,	Phyi, rohna	Chi	Báhiro H	Báhiro H	Báhír vai H
Outside					
Within	Nang, na	Náng	Lipta	Singou, Sing	Púma vai
Far	Né, Nyé	Tháring	Duré H	Gajáng	Pijáng
Near	Ring	Tháni	Chéng só	Khátai	Katai
Little	Nyúng	Nigúva	Átoisá	Tísí, Kitisi	Kiték si
Much	Máng, Tu- mo	Má guá	E'shúto	Gabáng	Takkri
How much?	Tsam, Tso- ma	Khá chevé	Hé joko	Béché báng	Bipáng
As, rel.	Hadétsúg	Khánda	Jédóng	Jirin	Jégándá
So, corr.	Détsúg	Théndá	Kódóng	Urin	Ugándá
Thus, poz.	Jitsúg	Dindá	Udóng	Urin	Ugándá
How?	Tsúg, Chit- sug	Kháché, Khánda	Hé sá, Hé dong	Bré	Bigándá
Why?	..	Khá ín	Haipáli	Mánó	Átáng
Yes	..	Ín	Jéng*	O'ngó*	Há
No	Má, Mi	Mén	Má, Manthú T	Ongá	Ahá
(Do) not	..	Má	Má T	Dá	Tá
Also, and	Yáng	Yáng	Caret	Bi, Bo	Bá
Or	..	Mo	Ná	Ná	Ná
This	Hadé	Di	Íthoĩ	Imbé	Ímara
That	Dé	Phi-di	Uthoĩ	O'bé	O'mara
Which, rel.	..	Thinda	Jédong	Jé, Jai H	Jón H
Jón					
Which, corr.	..	Thé	Kódong	Bi, (that)	Wón H
Tón					
Which?	Gáng	Khangí	Hai, Hétí	Má	Áto, Bíyó
Kón					
What? Kya	Chi	Kháng	Hai	Má	Átó
Who? Kón	Sú, Kha	Khangi, Sú	Hétí	Chúr	Cháng
Any thing,	Chizhig	Khá ín	Hété, Haidong	Múngbó, Jish- láp	Harj múrj
Kúcch					
Any body,	Súzhig,	Sú ín	Hété	Jishláp	Já-tá?
Kóĩ	Kháchig				
Eat!	Zo	Só	Chá	Já	Sá
Drink!	hThúng	Thúng	Ám	Lúng	Lúng
Sleep	Nyan	Nyé	Jím	Múdúláng	Gúr
Wake	..	Caret	Lho	Jakháng	Sarai
Laugh	hGad	Gá	Léng	Mini	Mini
Weep	Nú, Shúm	Gnó	Khár	Gáp	Hép
Be silent	Khrog	Chúm	Chiká pahi, Mádóp	Srithá	Tápchilip tong
Speak	brJod, Smrós	Caret	Dóp	Rai	Brot, Borot
Come	Hóng, sByon	Syo	Ló	Phoi	Phoi
Go	Sóng, Gró, Gyú	Gyó	Hadé	Tháng	Loi
Stand up	hChhár	Lóng	Jáp	Jakháng	Chap
Sit down	hDúg	Deh	Yong	Jó	Abak
Move, Walk	hGro	Gyó	Tí, Hadé	Thó, Tháng	Loĩ

\* Jéng and O'ngó mean rather it is, hast in Persian, than simple assent.



English.	Tibetan.		Dhimál.	Bódó.	Gáro.
	Written.	Spoken.			
Run	rGyúg	Gyúgé, Chong	Dháp	Khát	Talok
Give	hBúb, Phúl, Thona	Phing	Pí	Hot	Há
Take	bLán, Júng, Hén	Léng, Yá	Rhú	Lá, Ná T?	Lé, Lau
Strike	bDún, rDig	Dúng	Dánghai T	Sho	Tok
Kill	Shig, Sod, hGúm	Sé	Sé T	Shothát	Tok tat
Bring	hKhyon, sKych	Bá syo	Chú má	Lá bo	Láphá
Take away	hKhúr, hKhyer	Bák song	Chúng pú	Láng	Léláng
Lift up, raise	hDég, Slon, sNyob	Khúr	Lhopá	Bokháng	Paicho
Hear	Nyám, gSon	Nyén	Hin	Khaná chong	Natám
Understand	Soms, Go	Sám	Bújhté rhú	Bújilá H	Bújai H
Tell, relate	bShod, hChhod	Láp, Chwé	Dop	Rai	Borot
Good	Bazáng-po	Yappo	Elká	Gham	Péném
Bad	Náng-po	Dúkpo	Máélká	Hamma	Sarchá
Cold	Gráng-po	Thammo	Tírká	Gúshú	Chikrop
Hot	Tshá-po, Dropo	Chábo	Cháká	Gúdúng	Gútúng
Raw	..	Zyémbo	Sinkhá	Gatháng	Piting
Ripe	Sminbo	Chémbo	Minká	Gamang	Papman
Sweet	..	Gnármó	Tááká	Gadoi	Shamá
Sour	..	Caret	Dakká	Gaphá, Gakhói	Phakká
Bitter	..	Kháko	Khákká T.	Gakhá	Háni
Handsome	Dsésmo, sTúgpo	Jébo	Rémká	Majáng	Némá
Ugly	Midesma Mistúgpo	Mén jébo	Máremká	Chapma	Sarchá
Straight	Dránpó	Thángbo	Ghenká	Thúng júng	Préng dén
Crooked	sGúrbo, Túdpó	Kákpo	Kyoká	Khúngkrá	Kákrói
Black	Nágpo	Nákpo	Dááká	Gatcham	Pénék
White	dKárpo	Kárpo	Jééká	Gúphút	Bok láng
Red	sMúkpo	Márpo	Íká	Gajá	Písak
Green	hJáng khú	Jhángú	Nélpá	Samsram, Kháng shúr	Héng jeléng
Long	Ringpo	Rimbo	Rhinká T	Galou	Pillo
Short	Thúngpo	Thún dúng	Tótóká	Gúchúng	Bandók
Tall, } man	..	Thombo	Dhángáká	Gajou	Pillo
Short }	..	Mábó	Bángaraká	Gahai	Bandók
Small	Chhúng, Phra	Chún chún	Mhoiká	Múdúí	Pamar
Great	Chhénpo, sBombo	Bombo	Dhamká	Gédét	Gódá
Round	zLumpo	Riri	Gúrmaká	Dúllút ni, To- lotni	Góglot ni
Square	Grúb zhi (angles 4)	Thúzi (angles 4)	Dia thúni ká (angles 4)	Kónámanbréni (kóná is H)	Koná bri ni (kóná is H)
Flat, } Level }	..	Caret	Sáriká	Somán ni H	Gakshan
Fat	rGyagspo	Thó thembo	Dhámká	Gúphúng	Kánéntwa
Thin	Srobbo, Ridpo	Mábó ?	Syénká	Gaham	Jot kréng
Weariness	..	Gyák	Caret	Myéng dúng	Réwé kou
Thirst	sKóm	Khakúm	Chí ámli	Gáng dúng	Chíka láng nóitwa
Hunger	ITógs	Tok	Mhítú	U'nkwi dúng	Máyú phítwa

N. B. T post-fixed indicates a Tibetan etymon for the word, and H post-fixed, a Hindí or Urdú origin.

Thus it appears that there are, out of the above 190 words, derived from Hindí or from Tibetan, in Dhimál, in Bódó and in Gáro, as follows :—

	Hindí	Tibetan	} Out of a total of 190 words of prime use and necessi Ergo, these are adopted words ?
Dhimál	8	19	
Bódó	10	6	
Gáro	8	7	

*Journal of a passage down the Nerbudda, from Chikuldah to Baroach, with notices of the most important obstructions to the Navigation. By Captain FENWICK. Communicated by order of the Hon'ble the LIEUT.-GOVERNOR, N. W. P.*

No. 127 of 1849.

*From A. SHAKESPEAR, Esq., Asst. Secy. to the Government, N. W. P.  
To the Secretary Asiatic Society, Calcutta.*

*Dated Agra, the 1st Feb. 1849.*

*General Department, N. W. P.*

SIR,—In continuation of the letter to you from this Department, No. 746, dated the 31st May last, I am directed to forward, for submission to the Asiatic Society, a copy of Captain Fenwick's Journal of his passage down the Nerbudda, from Chikuldah to Baroach, in charge of boats laden with coal.

2nd. I am desired at the same time to forward the accompanying copy of an abstract of the two Journals which has been prepared in this office, and contains a notice of the most important obstructions to the navigation, which are met with in the course of the river. The matter contained in the Journals has not been found sufficiently full or connected to admit of the compilation of a clearer narrative.

3rd. It is probable that the Society may not consider Captain Fenwick's Journal, or even the abstract, sufficiently important to merit publication, yet as much regarding the navigation of the Nerbudda has already appeared in the Society's Journal, the Lieutenant-Governor is desirous to place on the records of the Society, the fullest information upon the subject, and hopes that some prominent notice of Captain Fenwick's passage and of its result may appear in the Journal.

I have the honour to be, Sir,

Your most obedient servant,

A. SHAKESPEAR,

*Asst. Secy. to the Govt. N. W. P.*

*Agra, the 1st Feb. 1849.*

Copy.

July 29th, 1848.—Left Chikulda at 8 A. M.

*Miles.*12 To *Dhurmrall*. Not a rock nor a ripple.1 *Hurnphal*. No rocks in the channel nor any difficulty.

$\frac{1}{4}$  Enter the *Borekheree* rapids. Had all the boats put to on the right bank, and taking with me four of the best boatmen, viz. Mudun, Bholoo, Bunnia, and another, proceeded in my boat to examine the passage.

1 *Borekheree*. Channel at the narrowest part about 60 feet very bad from the high waves. The boatmen sent back for the rest of the boats. All shipped in water. The double boat the most.

2 River studded with bluff rocks, some of them several feet above the water, some just under the surface. This is a very bad passage. The channel in some places 40 feet wide; waves very high. All the boats shipped in water.

$\frac{1}{2}$  *Very, very bad*. High waves. Channel very rapid. Rocks every where, and with difficulty avoided. One of the boats got fixed on a rock in the middle. Other boatmen had to swim to it, and it took some time to get it off.

1 Very bad rocks. The Channel very winding, intricate and dangerous.

$\frac{1}{2}$  Rapids. Very bad channel. Studded with rocks; 30 feet passage. Just below it a boat was dashed on a rock and completely lost; 38 bags of coal gone. The boatmen swam ashore; a bildar, who could not swim, was left on the rock during the night and brought off the next morning. Could not do it in the dark of the evening.

$\frac{1}{4}$  Put to on rocks; no village. The fleet separated for the night: 3 boats got down  $\frac{1}{4}$  mile. Mine and two others below the rock and rapid, and three boats above it.

July 30th.—Put off at 8 A. M.

$\frac{1}{2}$  Some rocks in the channel and rapids; a very small pointed rock in the middle of the river which widens here, and becomes free from dangerous rocks on each hand.

3 Clear and deep, only two or three rocks visible.

*Miles.*

A huge barrier of rocks across from bank to bank ; 30 feet channel near the right bank. This place is called *Kalee Kuraie*. High waves, rather bad ; no other practicable channel.

At 300 yards a bad rock in the middle under water, very dangerous. Current very rapid and rushing on it.

- 1 Isolated rocks all the way. Channel not bad, being broad and deep, near the left bank.

- 1 Clear and deep. Bluff high rocks in several places ; three channels, not difficult. The left hand one is the best.

A whirlpool, but not bad at present.

- 1 Clear.

A rapid head of the Dussana barrier and falls. Dangerous rapids from the channel not being well marked. *Very* high waves for 400 or 500 yards. All the boats shipped in water, except the large boat, Rewa Sunkur. The double boat the most.

- 1 A field on the right bank belonging to Dussana.

$\frac{1}{2}$  *Dussana*.

A rapid.

$\frac{1}{2}$  High waves the whole way ; rocks in the channel, which is 40 feet wide, 10 feet deep, as almost all the channels are just now.

- 1 Rocks the whole way, but passage not difficult or dangerous, being broad and deep.

A rapid, but not dangerous, deep water and good channel.

$\frac{1}{4}$  Bad rocks in the middle of the channel.

- 1 Not difficult.

A rapid for 300 yards ; waves ; a whirlpool, but not bad just now. Rocks under water, channel broad and deep.

- 1 Deep water ; rocks immersed and isolated all across ; waves. The river has widened for the last two miles.

Bad rocks, some under water, some appearing. The channel near the right bank ; deep and good.

*Kurhall*, on the left bank. Found the lost boat on a rock, one side smashed in altogether, totally useless.

- 2 Clear. Abundance of water.

Some rocks in the middle of the river and near the right bank, passage wide and easy ; ripples.



Miles.

- 2 Clear, deep and broad.

A huge, rock island on the right hand at the confluence of the Hutnee Belin rocks on the left hand. Passage broad and deep.

- 2 Clear and deep from bank to bank.

A village, or cultivations on the right bank.

A bluff, long, rock, island near the left bank. Broad, clear and deep stream on the right hand.

- $\frac{1}{4}$  A long range of bluff rocks in the middle of the river, deep ; good channels on either side.

- $\frac{1}{4}$  A rock island near the right bank. Passage on the left hand.

- $1\frac{1}{2}$  A barrier, and rapid. Rocks and waves across from bank to bank.

Channel on the left hand near the shore—only 20 feet wide.

- $\frac{1}{4}$  The head and first of the Bheetara barrier, falls and rapids ; *very, very bad*. The river studded with low rocks, from bank to bank, and apparently no passage.

Six bags of coal were taken out of the double boat this morning and put on some of the others. Rewa Sunkur taking 4 maunds more, making her cargo 5 marrees and 10 maunds.

Put to at  $\frac{1}{2}$  after 2 P. M. on rocks on the left bank opposite Bhutara.

- $\frac{1}{2}$  *Strong current*. The boats let down with ropes, brushing along the sides of perpendicular precipices 20 to 30 feet high, along the left bank ; the current rushing towards the barrier.

This barrier, or ridge of rocks, extends for about 300 yards. Studded with rocks, some just above the water, some under ; no practicable channel. The boats were let down with ropes, and by the hand, knocking and bumping on the rocks the whole way, and in some places dragged over ; 20 bags were taken out of Rewa Sunkur and carried over the rocks for about 150 yards. It and the double boat were taken over with much labour and difficulty, and we did not get over the work before 12 o'clock.

This passage is very tedious, but not so dangerous, or attended with the same risk, as in that below the Hirnphal for about 6 miles. *Three* ropes cannot be used, or punting be resorted to, and the oars are not powerful enough to command the boats

*Miles.*

through the winding channels—the current rushing on rocks on all hands.

$\frac{1}{2}$  Pretty good.

*The Beytana Ghat barrier.* Rapids and falls; put to on the right bank to examine them. Forbidding and fearful. The main stream is on the left hand, *very, very, very bad* for 300 yards. High waves. Almost a direct fall, carried my boat over with 4 of the best boatmen to test it. The boat nearly filled. The laden boats could not have been taken down by this channel; examined a narrow passage between rocks for 300 yards on the right bank. This is bad too, but there is no other; it is about 18 feet wide.

All the Chikuldah boats were lightened of 12 maunds each, Rewa Sunkur 13 maunds, and the double boat 24 maunds. The two latter and two of the Chikuldah, largest and best boats, were taken down the left or main channel, and four of the latter by the narrow one. The latter were managed with bamboos, the former with oars and paddles. Ropes cannot be used here. All shipped in water, and the double boat, as usual, a good deal.

The right hand channel is dangerous, from not being more than 18 feet wide, with pointed, projecting rocks on either hand. In one place the waves, here too, were very high. Almost a direct fall. The water several feet deep. The coal, which was landed, was carried over the rocks for some 500 yards.

- 1 Put up on the rocks on the right bank a little below the village of Bheetara and the rapids, the boatmen being knocked up and it being late.

Left from below Bheetara at 7 A. M. The river has fallen about 2 feet since yesterday evening. Leaving the rest of the boats moored, I proceeded in my boat with Mudun, Bhooloo, Bunnia and another, to examine the passage below, which appeared to be full of rocks and rapids.

At 300 yards there is a pointed rock in the middle of the passage, badly situated, just above the surface, the current rushing on it with great force; deep water.

- 1 Rocks and rapids the whole way, channel not well defined. My boat was put to and the boatmen sent back for the others.

## Miles.

1 *Hailkurree*. A gut or strait, between perpendicular, precipitous cliffs, 20 and 30 feet high, near the right bank. Deep water and slight current; width 70 or 80 yards. A very remarkable passage.

$\frac{1}{2}$  High rocks on either hand; channel about 150 yards or so; deep water; a bad place for whirlpools, as the villagers say.

Serkurree, on the right bank.

Serkurree barrier and rapid, called *Gulchee Ghat or Tar*, a very, very, very bad passage: rocks across from bank to bank, some just above the water, some under. The latter are the worst; only one difficult channel in the middle about 40 feet wide; deep water. Current rushing. Half the day lost in bringing the boats over.

For 100 yards channel from bank to bank, then rocks. A whirlpool and then a very deep pool.

A deep broad pool, a formidable, large whirlpool, dangerous; a single mango tree on the left bank points out the spot.

At 400 yards the village of Sadree on the left bank. A broad, deep pool.

At 300 yards a rapid, broad channel in the middle of the river.

On either hand very bad rocks.

A village just below on the right bank. A little cultivation on either hand.

$\frac{1}{2}$  Deep pool. Several isolated rocks. Channel deep and broad in the middle.

Rocks and ripples.

$\frac{1}{4}$  For first 300 yards, broad and deep channel on the left hand.

$\frac{1}{4}$  Deep pool.

Rocks on the right hand. A rock island, channel on each side.

$\frac{1}{2}$  A pool.

A bad rock in the middle just above the water, a very little ripple to denote it.

A village on the left bank; a deep pool; rocks on the right hand.

Fields on the left bank.

$\frac{3}{4}$  Clear.

Rocks on the right hand.

## Miles.

$\frac{1}{2}$  *Nanka Ghat*, barrier, rapids, &c. *very, very, very bad*. The boatmen compared it to *Shabe Surannah*; I examined the largest channel, which is in the centre, in my boat, and found it fearfully obstructed with rocks, rapids, rushing current, and their attendant perils; waves peculiarly high, and little whirlpools, or eddies. The water swelling and curving over the rocks and then falling headlong into a deep trough. All this extends for  $\frac{1}{4}$  mile. *Rewa Sunkur* was dashed against a rock and nearly lost. Luckily none of the laden boats came down by this channel. Signals were made in time to prevent them. They took to the left bank and came through another passage along the shore. Shallow, with rocks, and waves, but nothing to be compared to the other.

Put to at sunset below the falls, on the left bank, *Selakda* village; on the right bank *Gunnoo Patail*.

*2nd August, 1848. Left at 6 A. M.*

$1\frac{1}{2}$  A deep pool.

A bad rapid channel near the left bank.

$\frac{1}{2}$  A very bad rapid and whirlpool; obliged to use ropes.

$\frac{1}{2}$  A pool.

A very bad rapid; high waves; passage along the left bank.

$1\frac{1}{4}$  Rocks, rapids and high waves; a very bad passage. I came down in my boat by the left-hand channel, which we found not practicable for the laden boats; sent back the boatmen to bring them down by the right-hand channel, which is very shallow.

$\frac{3}{4}$  Deep strong current, clear channel.

Put to to examine below; rocks everywhere; one of the boats, the *Pundeth*, struck a rock and was nearly lost.

The village of *Chipha* on the right bank.

$1\frac{1}{2}$  Half the way clear, then bad rocks, rapid and high waves.

As usual, I took my boat down with *Mudun*, *Bholoo*, *Bunnia* and others, to examine the passage; found *this one* not practicable for the laden boats. The channel to the right was selected, and they went back for them. To prepare for accidents I had my boat ready below the rapid in the worst place. Ropes could not be used. There is a whirlpool under the fall or rapid; one



*Miles.*

of the laden boats first coming down, struck on the rock in the middle and at the head of the channel, but got off; and was enabled to reach the shore and land the coal before it filled. Shortly afterwards two boats, although they avoided the rock, were dragged into the rapid and waves, swamped and went down bodily; nothing more seen of them; then some of the boatmen swam ashore. Some were picked up by my boat; one young man got into the whirlpool and I gave him up for lost fortunately he got hold of an oar, and being an expert swimmer, landed himself low down. One of the two latter boats being under water for some time, rose again to the surface, almost erect in the centre of the whirlpool, and was brought to land. All this happened in the evening about 1 mile above Hanep.

61 maunds or bags of coal lost to-day.

Some of the builders and several of the boatmen have lost every thing they had—pots, pans, clothes, &c.

This morning, when leaving Selakda, the following arrangements were made and orders given accordingly:—Mudun was appointed chief, Bholoo and Bunnia his deputies. My boat was to lead at 200 or 300 yards or more in advance, according to circumstances. Rewa Sunkur to follow, then the Sangur or double boat. The rest were named too, and to come next according to their appointed order. The Karkoon's boat with only 5 bags of coal, was to bring up the rear; a red, a black and white flag was kept in my boat to make signals; on the red being hoisted all the boats were to pull ashore to the left bank instantly. The black pointed to the right bank, and the white directed to follow my boat.

*3rd August, 1848.*

Left above Hanep at 9 A. M. The two boats were repaired, 13 bags of coal put on board the small one, and 23 bags on the other, and 7 bags were taken in my boat. The Sangur, or double boat, was also, consequently lightened.

1 A deep pool.

A bad rapid. Rocks just above the water in the middle.

*Miles.*

Bhurroorgam, on the left bank.

- 2 A strong current and whirlpool.

*Bhallagooree* called *Byjee ka Phur*, a very narrow passage. High rocks on each hand, a very bad and dangerous whirlpool, very high waves ; some of the boats had narrow escapes.

- 1 A narrow passage. Huge rocks on either hand ; stopped here of two hours and sent on boatmen to examine the rapid and passage below.

$\frac{1}{4}$  A very bad channel near the left bank. A bluff rock island.

- 1 A bad rock in the middle of the channel. High rocks on each hand. A whirlpool.

- 2 Strong current ; a whirlpool ; a rapid. Two rocks in the middle. High waves.

$\frac{1}{2}$  Rocks, rapids and waves. A very bad and difficult passage. Peepulchope on the left bank.

- 1 Put to at 5 P. M. on the left bank.

Half of the boat which was lost yesterday, found here.

4th August, 1848.

Left below Peepulchope at 7 A. M.

The river has risen a good deal.

- 1 Stream rapid and broad.

A rock island on the right hand.

$\frac{1}{2}$  Rocks in the channel. A rapid and waves.

$\frac{1}{2}$  The same as above. There are two channels here, some of the boats came down by the right hand one, and some by the left passage. The latter is the worst.

$\frac{1}{2}$  Clear. Put to to examine below.

Rocks and strong current in the channel.

- 1 A rapid ; rocks on the right hand.

- 1 A rapid ; rocks on the left hand. Cultivation along the right bank teak trees.

$\frac{1}{2}$  A bad rock on the right hand, the current rushing on it.

A village on the right hand.

A rapid and high waves.

$\frac{1}{2}$  A bad rock in the channel ; a rapid ; high waves. Two date trees on the left bank. Cultivations.

## Miles.

A large bad whirlpool.

$\frac{1}{4}$  Put to to examine the rocky passage below.

$\frac{1}{4}$  Strong current. A rapid; very bad rocks in the middle of the channel. Bamboo bushes begin to appear.

$\frac{1}{2}$  High rocks almost across the river. Put to on the right bank to examine the passage. Channel along the left bank, not bad.

2 Clear channel along the right bank and middle, very strong current. A village on the left bank. River rising.

$\frac{1}{4}$  Rocks in the middle of the channel. Put to examine and allow the boatmen to take their breakfast.

1 Rocks, rapids, waves, *very* bad; my boat was dashed against a small pointed rock in the middle of the channel. It filled partially, heaved, swung round and plunged into the trough and waves below, but got out again; a laden boat would have gone down.

Put to to examine below.

$\frac{1}{4}$  A very bad rock, and below it a whirlpool,—very formidable. Almost all the boats got into it, were taken round and round for several times, dashed against each other, and got jammed on the vortex for a minute or two.

$\frac{1}{4}$  Bad rocks and rapids. River still rising.

$\frac{1}{4}$  Very bad, whirlpools, waves, &c.

$\frac{1}{4}$  A very bad rock in the middle of the channel, and a strong current rushing on it very dangerous.

Put to to examine the channel below.

$\frac{1}{4}$  A rock on the right hand of no consequence.

$\frac{1}{2}$  Beautiful plantations along the right bank, of palms, mangoes, Mowah trees and cultivations, interspersed with huts the whole way.

Two bad rocks in the middle of the stream.

$\frac{1}{2}$  Rocks in the middle, strong current, plantations, &c., continuing along the right bank, belonging to the village of Gudier.

1 Clear broad stream; put to to examine a rapid below.

Strong current, rocks on either hand but not dangerous. River still rising slowly.

1 *Very, very bad* rocks, a rapid and whirlpools, Surpon barrier, &c. Sulpan or Surpon; Mahadeo temple on the left bank.

Put to under Surpon at 5 P. M.

## Miles.

5th August, 1848.

8 A. M. at Surpon, boatmen attending the temple. The river has risen a little during the night. Heavy rain all night and now continued.

Put off at 9 A. M. Took another boatman on my boat to-day, having hitherto had only three.

Rocks on the left hand to be avoided ; strong current.

$\frac{1}{4}$  Rocks on the right hand. Current strong.

$\frac{1}{4}$  Rocks ; a rapid ; caution required. Dangerous waves and a bad whirlpool.

$\frac{3}{4}$  Rocks on each hand. Channel good.

A pagoda on the right bank.

A village on the left bank ; palms, mangoe trees, and cultivations and huts along the right bank.

2 Rapids ; currents and rocks but not bad.

Commencement or head, of the *Mookree Ghat*, *Phal Tar* or *barrier* falls, &c.

Put to to examine the passage. Huts, palms, &c. &c., along the right bank.

Rocks all over and across the river. Channel in the middle 40 or 50 yards wide, very strong current and high waves.

$\frac{1}{4}$  Clear.

Strong current ; a rock on the right hand ; channel along the left bank.

$\frac{1}{4}$  Strong current the whole way ; very bad rocks in the middle. Channel near the left bank.

A whirlpool in the middle, rather formidable current rushing towards rocks on the right hand, very dangerous ; numerous eddies or little whirlpools.

$\frac{1}{2}$  Mookree village, on the left bank.

Rocks, rapids, waves, whirlpools ; all very bad.

A large, huge rock island in the middle ; my boat took the left channel, which proved to be very bad and dangerous. Whirlpools, waves, strong current, &c. all very formidable ; we thought ourselves in peril for awhile. The boat was whirled and spun round and round, nearly filled by the waves and was dragged



## Miles.

towards some rocks on the right hand, and just escaped by a few feet from being dashed to pieces. The boatmen, especially Bhooloo, shewed great energy and presence of mind, and expertness, on this occasion. His coolness was completely unmoved by the eminent danger; with a few strokes of the paddle he kept the head of the boat off from a rock which we expected it would be impossible to avoid.

- $\frac{1}{2}$  Put to on the left bank; all the other boats were carried or forced into the right hand channel, which luckily proved to be not so bad; got down safely and put to on that bank.

River studded with rocky channels. Current rushing through them with sluice force, *all very bad*. It took some time to make a selection by trying an empty boat over some of them.

I consider this Mookree barrier as one of the very worst in the Nerbudda. I had a good view of it and the river for two miles or so, above and below, from a high rock, and it certainly looked quite frightful. The boatmen think the river half full, and say that it was higher when Captain Evans went down last season.

The Karkoon's boat was first taken down, the boatmen returned and carried over three others, *with 6 men to each*, and so got the whole down safely. My boat came into the right hand channel with a great deal of difficulty.

- $\frac{1}{2}$  *Very, very bad* rocks. A rapid and a whirlpool at the bottom of the channel, all the above from the upper part of the Mookree falls, &c. There is a *worse* passage yet below. At 2 P. M. all the boats arrived below the above whirlpool, and put to on the right bank.

- $\frac{1}{4}$  Strong current, a *torrent*, rapid waves, &c. &c. along the left bank, and in the middle; no boats could possibly live there just now, and this is the *main channel*. The boats were let down with ropes, along the rocks, and over shallows on the right bank; tedious work.

The main channel, or stream on the left, above alluded to, is studded with destructive rocks, the waves raging and lashing over them in spray and foam, numerous little whirlpools, or eddies

*Miles.*

moving down in circular sweeps, and bubbling up from the bottom with a roar.

From nearly the middle of the river, to the right bank, there are bluff rocks with narrow passages of 10 and 12 feet, with little falls, of 2 and 3 feet, and then suddenly deep.

$\frac{1}{4}$  Along the left bank the *torrent passage* continues worse than ever ; nothing could live in it.

Neemree on the right bank. Thonia on the left bank, abreast of the worst part of the channel.

Just below there is the *fearful whirlpool*. It embraces the whole bed of the river, and I think we have scarcely encountered any thing so awful and terrific. The boats were let down with ropes along the rocks, on the right bank, still with much apprehensions, for had they come within its influence nothing could have saved them. I take the river at this place to be between 300 and 500 yards wide or more.

$\frac{1}{4}$  Rocks on either hand.

For 400 yards strong current. Eddies and little whirlpools.

Deep pool, no rocks in the river. The hills are receding, villages, cultivations, plantations and topes and palms and other trees, all the signs of civilization and of a thriving people, are here exhibited on both banks of the river.

Fine broad little pools.

$\frac{1}{2}$  Last of the hills on the left bank.

2 Pool ; a noble stream.

1 Current and waves, sunken rocks dangerous from their not being visible.

A pagoda on the right bank.

$\frac{1}{2}$  Rocks and rapids, dangerous from the rocks not being seen, but immediately under the surface.

$\frac{1}{2}$  Put to at Emrio ; on the right bank Rajpeela Elayua, at 6 P. M.

Just at this moment the empty boat with the Pundeth struck on a rock  $\frac{1}{2}$  mile above, filled and got fixed. Luckily the river is falling. Took my boat with seven selected boatmen. Mudun and Bholoo, Bunnia, Gylia and others, and after great exertions got up to the rock, when it became completely dark. In trying

*Miles.*

to approach it near enough to throw over a rope, we found it could not be done, the current dashed us away past it, and we were obliged to leave the Karkoon and the three boatmen to their fate for the night, relying upon the river not rising, in which case they would be quite safe.

However to provide against every thing, I had one of the boats emptied forthwith, and kept ready to pick them up in the event of the boat floating off the rock. At this moment (it was pitch dark) we heard a shout, and soon after the voices of persons in the water, and shortly after all the four landed safely where we had put to. The boat having missed them. The Karkoon too had managed to reach the shore with the help of a couple of bamboos lashed together, but he was nearly exhausted. The rock is in the middle of the river, and the stream here is  $\frac{1}{2}$  mile broad, or more.

*6th August, 1848.*

The boat was brought off from the rock this morning.

Left Emrio at 10 A. M., having repaired the boat as well as we could, but it is quite shattered and will barely keep afloat.

- 1 Rocks in the middle, a pagoda on the right hand. Small sunken rocks and ripples over them on the right.
- 1 Gurhasur; on the right bank a Gurhee on the top of a small hill and a pagoda at the foot. Some sunken rocks and ripples along and near the right bank.
- 1 Aktesur pagoda on the right bank; nothing to remark, not a rock nor a ripple; smooth stream, from bank to bank; arrived at Chaudode in the evening and put up in an old house of the Guikwars.

*7th August, 1848.*

Left Chaudode at sunrise and arrived at Leeloora, or Lalore, at 5 P. M., on the right bank.

*8th August, 1848.*

Left Lalore at 4 A. M. Inspected the Kubar Bar on Muhunt's Island. Put to on an island at 4 P. M.

*9th August, 1848.*

Left the island at 6 A. M. and reached Baroach at 8 A. M.

*Note on Captain FENWICK'S passage down the Nerbudda in charge of boats laden with coal.*

Captain Fenwick (late of the Nizam's service) started with ten boats laden with coal, from below the Dharee falls, on the 5th of April, 1848, under instructions from the Resident of Indore, and has noted minutely in his journals all the difficulties and obstacles which he met with, but as we have ample information regarding the river from the Dharee falls to Hirunphal, and as it is allowed that no absolute obstructions to navigation exist in the lowest portion, i. e. from Tulluckwarrah to the sea, it will be sufficient to notice here only the most prominent points connected with those parts, and confine ourselves chiefly to the portion between the Burkhery rapids, just below the Hirunphal, to near Tulluckwarrah, respecting which we possess the least information, and which at the same time is evidently, (irrespective of the detached obstructions, such as those at the Dharee and Sahesurdarah falls, and at Hirunphal), by far the worst part of the river to navigate.

Captain Fenwick reached Chikuldah from the Dharee falls without any accident, on the 20th of April, having been 15 days on the way. The distance he calculated to be  $86\frac{3}{4}$  miles, which he divided as follows :—

*April 5th.*—To Sillanee  $9\frac{3}{4}$  miles ; no unusual difficulty met with.

*April 6th.*—To Alliagaum,  $12\frac{1}{4}$  miles. A narrow passage with four feet water and 3 turnings, difficult for laden boats, which were let down with ropes ; met with 2 miles from Sillanee ;  $1\frac{1}{2}$  mile further on Bhalerai rapid, very difficult passage, extending for more than 100 yards ; from this to Katghurra  $7\frac{3}{4}$  miles, nothing particular. The Katghurra rapid extended for about 600 yards, studded with rocks, channel dangerous, with 4 or 5 feet water. Laden boats eased down with ropes.

It appeared to Captain Fenwick that in the then state of the river between Dharee and Alliagaum, boats of more than 6 feet beam, 30 or 35 feet long, with  $2\frac{1}{2}$  feet wall sides, flat-bottomed, the bottom side planks of one log, scooped out, would be the only ones that could be generally used. During the monsoon he thought no boats could live at some of the places, where most dangerous whirlpools and high waves would be formed at that season. The boatmen corroborated this opinion.



*April 8th.*— $7\frac{3}{4}$  miles to Murdana Ghat. Several places mentioned as dangerous from rapids, rocks, and shallow water.

*April 9th.*—To Mundlusur, distance 12 miles, Murdana rapid extending 300 yards, channel in some places 8 feet wide with 2 feet water. For 2 miles before reaching Soolgaon, rocks all the way and shallow in many places.

*April 13th.*—To Myhesur  $3\frac{1}{2}$  miles.

*April 15th.*—To Suhesurdhara, one mile ; falls, rapids and very bad rocks in the channel, empty boats eased down with ropes with great difficulty.

*April 16th.*—To Akburpore, 5 miles ; chief difficulty a rapid about half way. Channel 8 feet : four feet fall and 2 to 3 feet water. Very bad rocks on either hand. The boats were half emptied and let down with ropes, men holding on each side, and reladen at the end of the rapid, which winds along for 30 or 40 yards, dashing against the rocks on either hand with great force.

*April 17th.*—To Kuttora,  $8\frac{1}{2}$  miles. At Akburpore changed two of the boats, which were old and in a leaky state. Several rapids and shallows in this portion, of which the Bhownesur rapid was the worst. Length 40 yards, 2 feet water over the rocks, eight feet passage, channel winding, difficult and dangerous, boats let down with ropes with much trouble. "This is one of the worst rapids in the river. At the bottom there is a fall of 3 feet, 7 feet passage, rocks on each hand, and a very bad and dangerous one in the middle of the outlet, to be feared the most. This rock should be removed."

*April 18th.*—To Kirnee,  $12\frac{1}{2}$  miles. Several troublesome obstructions met with. The boats were taken over one fall of 2 feet on bamboo poles.

*April 19th.*—To Lahna-Burda, 6 miles. Very shallow water in several places ; below Oordunna "a very shallow part, 9 inches water. A channel had to be made by removing the loose stones from the middle and piling them up on each side for 150 yards, to deepen the stream to 15 inches, when the boats were dragged over. Half the day taken up in the above work." Two more similar shallows overcome in the same way, about  $\frac{1}{4}$  of a mile lower down, and then a bad rapid to be worked through very cautiously, succeeded by rocks and shallows.

*Note by Captain Fenwick.*—"The laden boats require 18 inches of

water to float freely. The largest boat is 31 feet long and less than 5 feet wide, laden with  $2\frac{1}{2}$  marries.

*April 20th*.—To Chikuldah,  $8\frac{1}{2}$  miles. The navigation characterized by the usual impediments. A very bad rapid met with below Piplade, 15 inches water, rocks in the channel, against which the current rushed with great force. A fall of 3 feet, over which the boats were dragged.

*April 22nd*.—Captain Fenwick started from Chekuldah with a single boat, measuring 30 feet in length by  $4\frac{1}{2}$  wide, to examine the Hirunphal, which he describes thus:—Deep channel, 8 feet wide, current not strong in fall. Two bluff rocks in the middle of the river, one on either hand from the Phal.” Deep channel between rocks, 10 or 12 feet wide. Deep narrow pool, slight current; Hirunphal Ghat, a fall of 6 feet in 30, passage 8 or 10 feet, with projecting pointed rocks on each side, very bad and dangerous, 100 yards rapid.”

On the 23rd of April Captain Fenwick returned to Chikuldah, and appears to have proceeded shortly afterwards with two carts laden with 48 maunds of coal to Tulluckwarrah, and had reported his arrival at Ali-Rajpore on the 30th of April, and expected to reach Tulluckwarrah on or about the 6th of May. It was after his return to Chikuldah from this journey, I conclude, that he again embarked in charge of some boats laden with coal on the 29th of July 1848, from which date the second portion of his journal dates.

*July 29th*.—Left Chikuldah, and as far as the Hirunphal, 13 miles, met with no rocks in the channel nor any difficulty. Entered the Bhurkhery rapids, very difficult navigation. A boat, carrying 38 bags of coal was dashed on a rock and completely lost. Distance traversed  $18\frac{1}{2}$  miles by guess. Put to for the night on rocks.

*July 30th*.—After a short distance the river widened, but then came “a high barrier of rocks across from bank to bank, 30 feet channel near the right bank. This place, called *Kalee-Kuraee*. High waves, rather bad, no other practicable channel. At 300 yards a bad rock in the middle, under water, very dangerous. Current very rapid and rushing on it; about 3 miles further a rapid. Head of the Dussana barrier and falls. Dangerous rapids from the channel not being well marked, very high waves for 400 or 500 yards. All the boats shipped in water, except the large boat, the double boat the most.” From this no particular difficulty till within  $\frac{1}{4}$  of a mile of Bheetara, on the right

bank, where the falls and rapids were very bad. "The river studded with low rocks, from bank to bank, and apparently no passage. The cargo of the large boat was here increased by 4 maunds, (taken out of the double boat, making her cargo 5 marries and 10 maunds.) Distance traversed 20 miles by guess. Put to on rocks on the left bank opposite to Bheetara.

*July 31st.*—At  $\frac{1}{2}$  mile distant "a strong current. The boats let down with ropes, brushing along the sides of perpendicular precipices, 20 or 30 feet high, along the left bank. The current rushing towards the barrier. This barrier, or ridge of rocks, extends for about 300 yards, studded with rocks, some just above the water, some under, no practicable channel. The boats were let down with ropes and by the hand, knocking and bumping on the rocks the whole way, and in some places dragged over. Twenty bags were taken out of Rewa Sunkur (the large boat) and carried over the rocks for about 150 yards. It and the double boat were take over with much labour and difficulty, and we did not get over the work before 12 o'clock. This passage is very tedious, but not so dangerous or attended with the same risk as in that below the Hirunphal for about 6 miles. *There* ropes cannot be used, nor punting be resorted to, and the oars are not powerful enough to command the boats through the winding channels, the current rushing on rocks on all hands." For half a mile, pretty good and then the "Beytana Ghat barrier. Rapids and falls. Put to on the right bank to examine them. Forbidding and fearful. The main stream on the left-hand, very bad indeed for 300 yards. High waves. Almost a direct fall: carried my boat over with 4 of the best boatmen to test it. The boat nearly filled. The laden boats could not have been taken down by this channel. Examined a narrow passage between rocks for 300 yards on the right bank. This is bad too, but there is no other; it is about 18 feet wide."

All the Chikuldah boats were lightened by 12 maunds each. Rewa Sunkur (the large boat) 13 maunds, and the double boat 24 maunds. The two latter and two of the largest and best Chikuldah boats were taken down the left or main channel and four of the latter by the narrow one. The latter were managed with bamboos, the former with oars and paddles. Ropes cannot be used here. All shipped in water, and the double boat, as usual, a good deal.

“The right hand channel is dangerous from not being more than 18 feet wide, with pointed, projecting rocks on either hand. In one place the waves here too were very high. Almost a direct fall. The water several feet deep. The coal which was landed was carried over the rocks for some 500 yards.”

Put up on the rocks on the right bank, a little below the village of Bheetara and the rapids, the boatmen being knocked up and it being late. Distance traversed in the day, 2 miles by guess.

*August 1st.*—The river had fallen about 2 feet since the preceding evening. Leaving the rest of the boats moored, Capt. Fenwick proceeded in his boat to examine the passage below, which appeared to be full of rocks and rapids. Rocks and rapids and usual obstacles met with for about  $2\frac{1}{2}$  miles, and then an extremely bad barrier and rapid at Sirkurree. Half the day spent in bringing the boats over.

At  $\frac{1}{2}$  mile from Silakda, where they put to, another extremely difficult barrier Nanka ghat. “The boatmen compared it to Sahesur-darah. I examined the largest channel, which is in the centre, in my boat, and found it fearfully obstructed with rocks, rapids, rushing current and their attendant perils; waves peculiarly high, and little whirlpools or eddies: the water swelling and curving over the rocks and then falling headlong into a deep trough. All this extends for  $\frac{1}{4}$  mile. Rewa Sunkur (the largest boat) was dashed against a rock and nearly lost. Luckily none of the laden boats came down by this channel. Signals were made in time to prevent them. They took to the left bank and came through another passage along the shore. Shallow, with rocks and waves, but nothing compared to the other.”

Distance gone in the day  $5\frac{1}{4}$  miles by guess.

*August 2nd.*—The whole distance of six miles traversed on this day was characterized by serious impediments, several of which were happily surmounted without mishap, but at one mile from Hanep they were not so fortunate. On examining Captain Fenwick found that the left hand channel was not practicable for laden boats, and the right was selected. “To prepare for accidents,” Captain Fenwick writes, “I had my boat ready below the rapid in the worst place. Ropes could not be used. There is a whirlpool under the fall or rapid. One of the laden boats, first coming down, struck on the rock in the middle and head of the channel, but got off and was enabled to reach the shore



and land the coal before the boat filled. Shortly afterwards two boats, although they avoided the rock, were dragged into the rapid and waves, swamped and went down bodily, nothing more seen of them then. Some of the boatmen swam ashore, some were picked up by my boat. One young man got into the whirlpool and I gave him up for lost. Fortunately he got hold of one oar, and being an expert swimmer, landed himself low down. One of the two latter boats being under water for some time, rose again to the surface, almost erect, in the centre of the whirlpool, and was brought to land. All this happened in the evening about 1 mile above Hanep." 61 maunds of coal were lost on this occasion, several of the boatmen and bildars losing every thing they had.

*August 3rd.*—Before starting "the two boats (which had been damaged) were repaired; 13 bags of coal put on the small one and 23 bags on the other, and 7 bags were taken in my boat. The Saugor, a double boat, was also considerably lightened. At Bhallagooree, a very narrow passage, high rocks on each hand, a very bad and dangerous whirlpool; very high waves; some of the boats had very narrow escapes." Similar difficulties were found in the whole of this day's voyage, which was calculated at  $8\frac{3}{4}$  miles.

*August 4th.*—Left below Peepulchope and went about 14 miles to Soolpan, about 5 miles from which place Capt. Fenwick's boat had a narrow escape—"A laden boat would have gone down." At a short distance below this almost all the boats got into a formidable whirlpool, in which "they were taken round and round for several times; dashed against each other and got jammed in the vortex for a minute or two." Some very bad rocks, a rapid and whirlpools near Soolpan.

*August 5th.*—To Emrio, on the right bank, about  $10\frac{1}{2}$  miles. At the Mokree barrier, "rocks all over and across the river." After passing the village, a large rock island in the middle of the river. "My boat took the left channel, which proved to be very bad and dangerous, whirlpools, waves, strong current, &c. All very formidable. We thought ourselves in peril for a while. The boat was whirled and spun round and round, nearly filled by the waves, and was dragged towards some rocks on the right hand and just escaped by a few feet from being dashed to pieces. The boatmen, especially Bholoo, shewed great energy and presence of mind, and expertness on this occasion. His coolness

was complete. Unmoved by the eminent danger, with a few last strokes of the paddle he kept the head of the boat off from a rock which we expected it would be impossible to avoid. "All the other boats were carried, or forced into the right hand channel, which luckily proved to be not so bad: got down safely." River studded with rocky channels, current rushing through them with sluice force. All very bad. It took some time to make a selection by trying an empty boat over some of them."

"I consider this Mokree barrier to be one of the very worst in the Nerbudda. I had a good view of it and the river for two miles or so, above and below, from a high rock, and it certainly looked quite frightful. The boatmen think the river half full, and say that it was higher when Captain Evans went down last season. The Karkoon's boat was first taken down. The boatmen returned and carried over three others, with 6 men to each, and so got the whole down safely. My boat came into the right hand channel with a great deal of difficulty."

Three quarters of a mile below, the main channel or stream on the left, is studded with destructive rocks, the waves raging and lashing over them in spray and foam. "Quarter of a mile further worse than ever; nothing could live in it. A little below there is a fearful whirlpool. It embraces the whole bed of the river, and I think we have scarcely encountered any thing so awful and terrific. The boats were let down with ropes along the rocks on the right bank; still with much apprehension, for had they come within its influence nothing could have saved them. I take the river at this place to be between 300 and 500 yards wide or more."

Close to Emrio, on the right bank, where they put to for the night, one of the boats struck on a rock in the middle of the river, filled and stuck fast. The four boatmen and the Karkoon got safely to land fortunately, and the boat was brought off from the rock next morning.

*August 6th.*—Passed Gurreysir and Aktesur, and stopped at Chaudode.

*August 7th.*—From Chaudode to Leelore on the right bank.

*August 8th.*—Put to on an island beyond the Muhunt's island.

*August 9th.*—Reached Baroach.

Mr. Hamilton, the Resident at Indore, in forwarding this Journal, reported that 11 tons and 10 cwt. of coal had been delivered in the dock yard at Bombay by Capt. Fenwick.

*Journal of a trip to Sikim, in December 1848, with sketch map. By  
Dr. A. CAMPBELL, Member of the Asiatic Society.*

I had long wished to visit Sikim, but in vain. At last it came about as follows. In September last the Governor General, Lord Dalhousie, in reply to an application of mine for his authority to procure the permission of the Sikim Raja for Dr. Hooker's travels in his territory, directed me to address the Raja, and inform him that his Lordship expected, as an earnest of his constant professions of friendship for the British Government, that he would afford Dr. Hooker every facility for the prosecution of his scientific researches in his territory.

The Raja was addressed by me in suitable terms, but the result was in reality a flat refusal; although it was speciously attempted to be concealed under various pretexts, the chief of which related to the dreaded wrath of the guardian deities of Sikim if their sacred land should be invaded by an English gentleman.

The whole of Sikim was said to be thus sacred; the *most* sacred, and most jealously guarded of all its parts was Kunchinjinga,\* and this was the special object of the traveller's research, as I had informed His Highness.

On the receipt of this letter I expressed to the bearer of it, and to the Raja's Agents with me at Darjeeling, how fully and palpably it displayed the real unfriendliness that existed at the Raja's Durbar, instead of the kindly feelings the Governor General had relied on, as evidenced in the Raja's correspondence with me, and with my Government. I pointed out how forcibly this view of the matter would strike His Lordship: and if the Raja was desirous of standing well with my Government, I informed them that no means could have been better devised to thwart the intention than the refusal of this simple, but direct request to His Highness. They expressed their entire coincidence in my view of the case, and urgently begged of me not to report the Raja's answer to Government until they could refer to the Durbar, and get fresh orders. This they expected would take 10 days; and the Agent assured me that the required permission would in all probability be accorded. I waited accordingly for the required time, but to no

\* Elevation of Kunchinjinga, 23,176 feet.

purpose, and was just despatching a letter to the Raja fully explaining my opinions on his Agent's proceedings, and on his own letter, when fresh orders arrived. They were not of a much more friendly tenor than the letter to myself, at least as they were communicated to me by the Agent ; but the upshot was, after much expostulation, and every effort made by me to ascertain the real nature of the orders, that the Agent agreed to allow Dr. Hooker to proceed, and to procure safe conduct and good treatment for him through Sikim to the Nipal frontier of Kanglanamoo via Paimiongchi and Jongri. It was Dr. Hooker's purpose to go on from Kanglanamoo to the Kanglachema pass of the snowy range, and to enable him to do this I had previously procured the consent of the Nipal Durbar through the Resident, and a guard consisting of a Havildar's party came from Ilamgurhy\* to Darjeeling to escort him.

After all the preparations were made the Raja's Agent raised a new and unexpected difficulty. He refused to allow the Nipalese guard to pass through Sikim with Dr. Hooker, and by this means fairly, or rather unfairly discomfitted me ; for I did not feel quite at liberty to say that his objection to the passage of the Nipalese, although forming part of Dr. Hooker's escort, was altogether unreasonable, and as he rested the ruin of the project on this only, he gained his point—which was delay. I ascertained to my full satisfaction, that from the beginning he had no intention of allowing the journey, and I believe that the objection to the Nipalese was a mere pretence to save himself from openly refusing the permission he had previously granted.

I had long ago made up my mind to the impossibility of carrying on business satisfactorily with the Sikim Raja, through his officers, until they should be differently and better instructed. The death in 1847, of the Dewan Ilam Sing, removed from the Raja's counsels the only man of any honesty, or to be at all trusted, in word or deed. Of this I have ample evidence, and was fully satisfied,† and as the Agent on refusing leave to the passage of the Nipalese guard, asked my permission to return to the Durbar, I gladly gave it, and wrote to the Raja an account of his proceedings, and said that what I had long felt as to the impossibility of transacting business with his officers would now

\* Nipalese post, on eastern frontier.

† See my Office Records, *passim*.



be apparent to himself, and that as his Agent had left me, I should report the whole affair to the Governor General, and await his orders. I did so through the private Secretary, pending my formal report, and asked permission to visit the Raja, as the only means I now had of ascertaining his real sentiments and feelings towards our government. With a confidence in my good intentions, for which I feel most grateful, His Lordship readily gave me the required permission to visit the Durbar, but without any specific diplomatic powers for the occasion. This permission reached me on the 22nd November, my preparations were put in hand at once, and on the 29th I despatched a letter to the Raja communicating my purpose of visiting him. I informed him that I should leave Darjeeling about the 6th of December, and at the same time that I had that day sent 30 porters with grain, &c. in advance under charge of a Havildar, and 8 Sepoys, and I requested the Rajah's officer at Namgialachi to let the party proceed as far as the Teesta River, there to await my arrival.

On the 3rd, at daylight, when I was at Kursiang, I received a letter from my Moonshi with the food and guard at Namgialachi, as follows :

“Starting from Darjeeling on the 29th, and arriving at this place on the evening of the 1st instant, I made over your Honor's Purwannah to the Neboo of Namchi, as well as the letter for the Sikim Raja, and I informed him of my orders to proceed as far as the Teesta river, to which he replied, that he was unable to let me proceed without his Raja's orders ; that he would report the same, and further consult with the Mahapun Kada, and 2 or 3 other officers, whose arrival he was expecting that day ; further, he said that he would not allow you, Sir, to proceed, but that if you wished to go by force then they would lose their lives.”

This was a bad beginning. I returned from Kursiang at once, hurried all my preparations, and started from Darjeeling at 2 P. M. of the 4th December for the guard-house above the Rungeet river, where I arrived at 5 o'clock, and found my servants and all things ready to receive me. My equipment is as follows :—A tent made of two Nipal blankets, which when pitched covers 10 feet of ground by 8, and with the poles and carpet is an easy load for one man. It contains my bed, a chair, and a 3-foot square table. I have two ponies, two table servants, a valet, 4 Chuprassies, a Moonshi, an Interpreter ; a guard of 8 Sepoys,

and a Havildar, 38 porter loads of rice, flour, salt, gram and choorah, with 20 more loads of personal baggage of my own and the servants, and 3 sirdars for their coolies. A double-barrel gun, a brace of pistols, a compass and thermometer, and a Nipal dandy or litter—in case of illness, or accidents end the list. The further sinews of travel are 400 rupees, principally in small coins, and some articles for presents, consisting of broadcloth, beads, snuff, rum, coral, rings, and some crystal vessels.\*

At the guard-house, elevation 1600 feet, the feeling of warmth was delightful. The Thermometer stood at 68° and fell 4° only during the whole night; I hate cold, and all below the sixties is of this sort. It is greatly the fashion in the east to praise the weather when you are half frozen. Give me a temperate clime for comfort and pleasure; any thing lower than 60° of Faht. feels cold, and cold, except in the subsequent re-action, is decidedly uncomfortable. It was a lovely morning on the 5th, a thin light purple fog rose from the noisy Rungno at daylight, and spreading itself over the deep valley of this stream to the south of the guard-house, had scarcely enveloped our gipsy-like encampment, when the sun, rising in perfect splendour, instantly dispelled it.

Not a drop of dew was formed at our encampment during the night. The grass was quite dry and the standing hairs of my blanket tent were without a globule. I do not understand this; but will consult Hooker about it. I very much wish that he was with me. We were on a ridge half a mile lower down on the side of the spur, and all the way to the Rungeet there was a heavy dew.

The Pooah Hemp plant, *Bœhmeria nivea*, is very abundant, and grows luxuriantly between the guard-house and the river.

We started at  $\frac{1}{2}$  past 7 and had crossed 2 ponies by swimming, and 30 loaded men by a bamboo raft to the left bank of the Rungeet by  $\frac{1}{2}$  past 9. The cane bridge—elevation above the sea 1000 feet—is in a very rickety state indeed; but I ordered the Badamtam Lepchas, who came down to ferry our party, to remain there a couple of days, and repair it. It was their duty under the old regime, Sikim Rajahs, to do this annually, and it may well be the same for the future. The Lepchas are expert enough ferrymen with the raft. It is made something like a boat, but more like a wedge, for it is very wide and open behind. The

\* These particulars may be useful to future travellers.

water rushes through it, and over it too; but it is quite safe. It is pulled to and fro across the river by a party on either bank. Strips of the large bamboo are used instead of rope for this purpose. Horses are badly and cruelly used in ferrying by the Lepchas, who give this noble beast no credit as a swimmer. They take him along side of the raft, holding his head high on the bamboos, and thus tow him across. The following is a much more simple plan, and causes little delay to the traveller. Take a log-line in your hand and cross on the raft; let it be long enough to stretch across the river, leave one end on this side, and pay it out as you proceed. When you have landed look out for a good landing place for the horse some yards lower down. With the log-line tied to his bit let him be pushed into the stream, and you can with perfect ease guide him to the spot you have fixed for landing him, and he swims all the way unhampered and unchoked. My Lepchas never saw ponies swim alone before. They greatly praised the nautical performances of mine to-day.

When across the Rungeet you find a road running parallel to the stream S. E. and N. W.; the turn to your left leads to Namgialachi; the right one viâ Chadam to the Teesta and Dukeeling. After  $\frac{1}{2}$  a mile or so of level road you ascend in an easterly direction along a steep path through long grass, and Sal trees, for a couple of miles, when you cross a bubbling brook running rapidly down the hill from the south of you. Beyond this brook the hillside is a fine open expanse of small bamboo grass with Fir\* and Sal trees; the soil, whitish clay, dry and hard; and it continues so for 3 or 4 miles, when you top the ridge of Meksneeoo. Here the road takes a northerly direction, you lose the Sal, Pines and grass, and have the vegetation of 3000 feet. I have noted bearings from this spot, which are appended. The road continues to skirt the south face of Meksneeoo and Silukfoke, which is rocky and precipitous, until you come to an open space at the west end of a ridge, which running east connects Namgialachi with Silukfoke and Tendong. Namgialachi is about half way between Silukfoke and Tendong, and about 3000 feet I think lower than Tendong. Not being able to reach Namgialachi on the 5th, we halted at a spring of pretty good water, about 4 miles short of it. There was scant room to pitch the tent, but my bed and table were levelled with stones,

\* Cheer, or *Pinus longifolia*.



and I was soon quite snug. The Thermometer did not fall below 50° during the night, but it felt nevertheless very cold ; started at  $\frac{1}{2}$  past 7 of the 6th, and reached Namgialachi viâ Silukfoke at 11 A. M., distance 4 miles. The road from the Rungeet is generally rideable. The distance may be 12 miles. The whole tract is very poorly supplied with water ; there are but 3 streams I think altogether. A little repair to the road and alteration of the line in some places would render it a pleasant day's trip from Darjeeling. At Namgialachi there is not much to be seen. The encamping ground is overrun with high wormwood jungle. The top of Silukfoke however is well worth visiting. It is the round green knoll commonly called Namgialachi at Darjeeling, and very conspicuous from its smooth grassy look. The Lama of Namchi, (abbreviation for Namgialachi,) was waiting for me where the road turns off to his house, and accompanied me to the top. I reckon it to be 500 feet lower than Darjeeling. It is a very sacred peak, and like Kunchinjinga, is probably reckoned so because it is not fit for the plough or spade. There is no water for irrigation, and the soil is so dry and barren that it is not fit for crops of any sort. It is an open, and very level expanse of 20 acres or so, all under a coarse sort of grass. The view is very fine in all directions ; the valley of the Rungeet apparently, right up to the snow, Singalelah, Phuglout, Tonglo, and the crest of Sinchul to the westward,—Sandoopchi, Tendong, Numdoomrum, Sankarjong and Lakharri to the eastward, and Darjeeling, with the Jilla Pahar, Tugvor, and Lebong offshoots, is an exceedingly pretty landscape to the west ; Kunchinjinga was not out ; but I have noted a bearing of the snowy peak, "D 2" of Waugh's Chart, as well as bearings of the hills to the west and east. Numdoomrum is a level saddle, running north and south and connecting Sandoopchi on the north with Lingdam to the south, Sankarjong is the southern continuation of Tendong, and is a very red wall-like ridge visible from the Darjeeling hill ; Lakharri is a rugged and higher peak which terminates Sankarjong to the south ; both overhang the Teesta, which runs east of them. The "Manpeen" stream rises from Sandoopchi, and after receiving a tributary which rises at Numdoomrum, runs westerly to fall into the Rungeet a mile below the cave bridge ; Manbroo is the ridge stretching from Tendong to the N. W., and its highest point is named Tingbi. I walked out at Namgialachi in the evening and had a fine prospect of the country



to the N. and N. West, the monastery of Pemiongchi, the ridge of Rinchinpoong, with the valleys of the Kullait, Roho, Ratong and Rumman. The Kullait, rising in Singalelah, runs in an easterly direction to the great Rungeet, and south of the Pemiongchi ridge. The Roho, nearly parallel, runs south of Rinchinpoong. I have noted bearings of these places. The only cultivation at Namgialachi is wheat, which is just now springing above ground. The Meboo, or local officer of the Raja stationed here, and 8 or 10 other Bhotiah families have rather extensive fields well tilled and fenced in round their respective houses, which are of wood on raised posts and thatched with split bamboo. The land is fertile. A light loam, and with manure of cow-dung, yields an annual crop of wheat; rice is grown a little lower down. There are some good turnips here, and the light yellow hill plantain ripens also. A plant named "Moon," the grain of which is like millet, is grown for the oil of its seed. The whole of the cultivated ground is overrun with rank wormwood. The Meboo Lama, and others, have fine herds of cows, and butter is procurable at 3 seers, (6 lbs.) per rupee. A little rice is also procurable from the neighbouring hamlets at 18 seers per rupee. I heard nothing of the Raja's officers all day, nor did any of them come near me. As they had stopped my advanced supplies here for 6 days, thereby putting me to heavy charges for the hire of 40 coolies who are setting idle, and had thus done my journey all the harm in their power, I had no wish to have more to do with them. After dark they sent to say they would visit me, but I declined on account of the lateness of the hour, and as they had left me all day to shift for myself, I preferred doing so for the night also. If an answer to my letter to the Raja announcing my visit had reached them, it would have been announced. From them therefore I anticipated no offers of civility, and I avoided proffered incivility, with a good excuse for putting off their visit.

The Lama of Silukfoke is the most polite man I have yet met with, although I have fallen in with but one saucy fellow; and more than a hundred Sikimites met us yesterday en route to Darjeeling. A string of 50 stout Meches returning from Namgialachi having deposited loads of rice, sugar, tabacco, and other produce of the Morung there in transit to the Raja; and about 20 or more Lepchas loaded with oranges from Temi Burmeok and other places near the Teesta, proceeding to Darjeel-

ing, formed the bulk of them. The encounter with the saucy fellow was as follows. He was a young Bhotia of jaunty air, and considerable pretension. We met in a very narrow path, I was at the head of my long line of companions, he was heading half a dozen of his ; a few paces behind me was my Lepcha interpreter. The gentleman brushed past me rather rudely, and with hat in hand made a very low obeisance to the interpreter. "That is my servant," I said, pointing to the interpreter ; "am I no one, and who are you to behave so rudely?" He became flurried, and said ; "I did not see you." "You see me now, and my servant has told you, who I am, I expect you in common courtesy to salute me as well as my follower ; it is the habit of all the world for men to interchange salutations when they meet in this way, and not pass like pigs or horses. Is it not so?" He agreed, and blushing deeply, while his companions laughed heartily at him, he salaamed ; and then we chatted amicably altogether. His manners were probably borrowed from the Sikim officials ; and theirs to European gentlemen are very indifferent, otherwise I could not have pained myself as I did by this shew of exigency.\* Now to the civil Lama of Silukfoke. He is as fat as Falstaff, and puffed most effectingly as he followed my long strides up the mountain. We passed his house soon after he met us, and as I halted to look at it, he sent a messenger within who speedily re-appeared with two Choongas of fresh Murwa Beer, each rolled up in a clean piece of new American sheeting, and followed by a boy carrying two drinking reeds with the mouth-pieces rolled up in bits of fresh plantain leaf, I was presented with one, and the Kaji, my interpreter with the other. I drank to our host, and found the beverage far from bad. The Lama was communicative on all subjects, without any restraint, and on our return from the top of the hill he took me to his house, and I sat half an hour with him in his study, where his books and professional paraphernalia made a very respectable appearance. On the shelves was one religious work just received from Thibet, of which I have a half promise, "The Bhoom," in 12 large volumes. Then there was the large double-headed drum, like two Tambourines joined together, with a long handle to it ; a couple of bells ; a couch of two human thigh-bones

\* P. S. This was the first and the last rudeness I met with during my trip, and I have no doubt that my notice of it reached the Durbar, and brought about the non-repetition of it.

rolled round with brass wire, and trumpet ended with brass used for calling to prayers. A bamboo quiver for holding the little rods of spikenard used as incense ; some flowers fresh laid on the table, and a bottle of milk. As we entered the sanctum a young and blooming woman slipped out past us. Mayhap the flower girl of His Holiness. Silukfoke is infested with leopards or lynxes, who often carry off the Lama's young pigs and goats. His cows are numerous and healthy. I asked him about the murrain which is occasionally so fatal at Darjeeling, and is raging there now. He knew of it, and attributes its spread to the cows grazing where people urinate, who have eaten of the flesh of animals dead of the disease.

A party of Thibetans has arrived here to-day en route to Darjeeling, and the Titalya Fair. They have 30 baggage sheep and goats, and with 20 women, children of all ages, and as many men, they form the dirtiest Kafilā I ever set eyes on. They make their way by begging, and have a good deal of merchandise in musk, chowrees, salt, blankets, turquoise and striped woollens. There is the ruin of a monastery here of some size. It is of stone, very well built, without mortar, three storied, 75 feet long by 33, with narrow Gothic arched windows, and divided into one large centre and two smaller end apartments. No one can tell how long it has been abandoned, or when it was built. Probably the Goorka conquest of Sikim was the date of the former. There is a row of barberry trees round it, and some pink-flowered Cinchona trees, Sumbrung Koong, near at hand. The present Goomba is a stone building not half the size of the old one, badly built and disproportioned. It is more like a lime-kiln than a monastery, and has an ugly grass thatch roof withal. The ruin reminds me greatly of the Old Roman Catholic Churches in the Highlands of Scotland, which have been converted into places of burial by the Protestants, who, it would appear, from their abandoning them as places of worship for the living, were still tolerant enough to retain them for the use of the dead.

The prettiest thing at Namgialachi is a long solid stone edifice on the road, with a pathway on either side of it. It is called a "Mundong." It is 64 feet long by 10 or 12 broad, and 16 high. It is a solid stone edifice, covered with engraved slabs, which are let into it. Most of these slabs have merely the "Om, mane paime, Om," in the Thibetan charac-



ter on them. The others have various texts from the Thibetan scriptures. On the flat top of the "Mundong" are five little Chaityas, of the usual round shape; at the east end of it are two large Chaityas, and at the south another.

So much for Namgialachi, which I purpose quitting to-morrow, and which has turned out to be of greater interest than I had anticipated.

*Temi, December 7th.*—Started from Namgialachi at 6 A. M., and having gone over the top of Tendong and descended to the Temi road on the N. W. face of the mountain, arrived here at 4 P. M. I reckon the distance by the regular road 12 to 14 miles. It is passable for ponies, and one half of it may be ridden over easily enough.

Two hours and a half of steep ascent brought us to the top of Sundoopchi. This peak overhangs Namgialachi. The whole way is finely wooded; near the summit oaks, five species, are abundant. From this the road runs along the ridge which connects Sundoopchi with Tendong, it is an avenue of fine trees all the way to "Lamchook," and may be 4 miles long; total distance from Namchi about 6 miles. About half way between Sundoopchi and Lamchook there is an immense mass of quartz, about 30 feet high and twice that length. Its shelter is used as a resting place, and called a "Lahup," or cave; a mile nearer Lamchook there is a fine flat spot on the ridge with water close by, and well suited for encamping on. It is named Baktchin.

At Lamchook, which the term implies, two roads diverge. That to the left is the high road to Temi, the other leads right up Tendong and over its summit to Burmeok, the residence of a Kaji, and above the Tuksmapoo, or Tuk ghat of the Teesta.

The top of Tendong, 8600 feet, is a spacious flat 100 yards square or more, with fine swelling shoulders on all sides. There is a stone Chaitya in the centre, about 20 feet high, and some remains of a Goomba which was commenced a few years ago, but sunk in its foundations. A Lama is stationed here for two months during the rains to perform religious exercises. There is a spring of excellent water near the top, and the forest, which is gigantic, is almost entirely composed of oaks, and 3 species of *Rhododendron*, viz: the scarlet, the large and the smaller white. I have collected a large quantity of the seed of the two last in fine order. The other striking plants are the Hally, a *Penax*, with large plumes of purple seeds, *Hypericum*, the large-flowered species of a small



plant covering the ground with scarlet berries, and raspberries. Descending on the north side of the mountain, which is quite precipitous and rocky, yet bearing gigantic oaks and Rhododendrons we reached the Temi road in half an hour. I never travelled on a steeper path ; it is what the Yankees call Slantindicular, i. e. more than perpendicular ! My knees will ache for a fortnight, whenever I think of it. After joining the Temi road we came on a portion of it roughly flagged with stone. This was pointed out as the work of the Bhootanese, who it appears made an inroad into Sikim as far west as the old Durbar, before they were repulsed. This was in the time of the present Raja's grandfather.

At "Atooknot," 8 or 9 miles from Namchi, a road goes off to the left leading to Daling Goomba, and Yangang, and a little further on the descent begins which continues to Temi, it took us upwards of 2 hours and a half without any halts, direction easterly. I never saw a nobler forest than it is all the way from Lamchook. The chesnuts and oaks of great girth and shaft, are finer than anywhere I have been yet ; I measured the former to 26 feet in circumference, and the latter to 22 feet.

From a knoll above the station of Temi I had an extensive prospect, although the snowy mountains were not visible. The Teesta running southerly, and I reckon 4000 feet below us, is a fine stream even at this distance.

The valley of it appears to stretch N. 29° E. right up to the snow,\* with numerous spurs from lofty mountains on either side running down to it. On the west the peak of Mainomchoo, bearing N. to W. is the most conspicuous to the N. E. and forming the opposite bank to this is Badong (A.) Further to the east is the Goomba of Rumtik, brilliantly white in contrast with the wooded ridge it stands on. It is 2 journies from this across the Teesta, and on the N. bank of the Rungbo river. To the east is another Badong, a fine mountain, probably 7000 feet high ; also across the Teesta, and to the south east is Burmeok the residence of a Kaji, and a spur from Tendong.

Tendong, elevation 8660 feet, as it is the most remarkable feature in the country between the Rungeet and the Teesta, on account of its eleva-

\* See Journal of Dec. 12. This is the Rungmo or Rungmon feeder, rising in Kali Kongri, that bears N. E. from Temi.

tion, and rounded form, is also remarkable as the centre of a number of prominent spurs and ridges.

To the south it throws off Sankarjong and Lakharry; to the west Sundoopchi and the Namgialachi ridge, which connects it with Silukfoke to the N. W. and N. Manbroo, and Atooknot to the S. E. the spur of Burmeok. The whole of this extensive tract is, I think, remarkable for scarcity of water at high elevations. Certainly so as compared with the Sinchul or Darjeeling division of Sikim. The road travelled to-day, not including my topping of Tendong is nowhere, I think, of a higher elevation than 7000 feet, yet in 12 or 14 miles there are, but two springs of water, i. e. at Baktchin and Atooknot, and they are some way below it. On the Auckland road, Darjeeling, 6900 feet, which runs for 3 miles round the west of the Jilla Pahar, which is only 7600 feet; there are at least half a dozen of springs, and all of them rising well above the road. Tendong has the rock cropping out freely on the N. and west faces indeed it is very rocky, whereas the Jilla Pahar is on its N. and W. sides covered with deep soil, and hence perhaps the difference. The same peculiarities as contrasted with the Tendong region apply to Sinchul. From Atooknot to Temi, direction E., the soil is rather stiff, reddish and clayey. Temi is the station of a Phipun; he is subordinate to Mahapun Kada, who manages the country between the Teesta and Namchí, exclusive of Burmeok, which is under the Kaji of that name.

We heard to-day that they have had great doings lately at the Raja's on the occasion of his eldest son's marriage. The bride is a Thibetan lady, fresh imported for the occasion. Her relations have accompanied her to the Durbar to grace the bridal ceremony with their presence, *and* to carry back the remainder of the endowment money, (Vulgo, purchase money.)

In 1841 the second son, and heir-apparent of the Raja, died without issue. The eldest, Tubgain Lama, was the high priest,—head Lama of the kingdom,—and bound to celibacy, so that there was no presumptive heir except a boy of illegitimate birth, the nephew of Dunia Namgay, now the chief minister. It was first recommended that the Raja should take unto himself a young wife in the hope of raising an heir to his house, and he did so: but to no avail. Then it was tried to procure the recognized succession for the illegitimate son, but this has failed

also ; almost all the chiefs of the country, the priesthood generally, and the people, as far as they care at all about the matter, were strongly in favor of Tubgain Lama's succession, and they carried the point, he being nothing loath ; but he required a dispensation from the Pope at Lassa to enable him to resume secular pursuits, and to marry. This was sometime ago obtained, and the marriage is the first result.

There was great feasting, and some rejoicing ; all the chiefs of fitting degree, amounting it is said to 150, were entertained by the Raja for 18 days, the proper period, from the Royal Kitchen, and served in a large hall ; the chief minister, and the Lama of Pemiongchi presiding.

As I was starting this morning the Meboo\* of Namchi, came with a letter to me from the Raja, which he said he had received during the night, and that it was the Raja's wish that I should stay at Namchi for sometime, or go on to Burmeok, one march, and stay there. Thus advised of the probable contents of the letter, I told the Meboo I would take it on with me to Temi, and read it there, and as some of my people had started on that road, I should do so too rather than go by Burmeok. I was lead to this by a feeling amounting almost to certainty that it was a plan to delay me, and it has so turned out, for I hear that two officers are gone from the Durbar to that place to meet me, and endeavour to put obstacles in the way of my journey. Under what pretext, I do not know, nor do I desire the knowledge. I bade good bye to the Meboo, and gave  $\frac{1}{4}$  and  $\frac{1}{2}$  anna pieces to some old women and children, who brought me eggs, fowls, and some rice.

*Namphok right bank of Teesta, 8th December.*—Was up, and dressed before sunrise, and if not rewarded for my vigilance by any new and grander view of the snows, I was so fully by the prospect up the valley of the Teesta, and by the gradual illumination of the snowy peaks at its source.† An hour later, and from a point above and another below Temi, I had a fine view of Kunchinjinga, and of a peak which is not visible from Darjeeling. It is E. of the highest points of Kunchin, and appears to be behind it. It may be Biddulph's Pundeem, which was seen from Changachiling, and which is not Waugh's peak of that name. The mountain of Mainomchoo shuts out the full view to the base of the E. faces of the Kunchin

\* Officer of Police.

† See entries in this journal of the 12th, for these peaks.

peaks. The prospect thence must be superb, and I hope to live to see it. That, and a clear day on Tendong, would satisfy me for a long time to come. I am now on the best road to Mainomchoo, which is reached viâ Yangang Goomba, close above this.\*

From Temi the descent of yesterday is continued, and very steep the whole way to the Rungni, which is the first western feeder of the Teesta met with on this route. It is 4 hours' work. The direction as far as Turke is northerly, thence it runs north and parallel with the Teesta, descending steeply to near the junction of the Rungni with the Teesta. Cross Rungni to Beng, and in a northerly direction close to Teesta you have a beautiful level ride of a mile through an open forest of Toon, and other tropical trees, to the Rungpo, a second western feeder of the Teesta. This is a deep, and brawling stream, and crossed on a bundle of long bamboos with a rail to hold by.

From the Rungpo to this place there is a short steep ascent, and bad road to the Yangang spur—direction north. The Teesta is close below us, bright green, and very noisy. Orange groves are abundant in the Teesta valley; principally close to the river, and two species of oak are most abundant here, and all the way from the Rungni. One of them is now in flower; Pooah abounds; but not a tree, (Fern) since we left Lebung. Elevation I reckon *not* 1,000 feet above the river. The Rungni falls into the Teesta at its bend to the eastward round Badong. Temperature of air at Rungni 11 A. M. 66°. Temperature of the stream 61°.

The following are the ghats, (Ferries)—of the Teesta, from the south:—

1. Katong Sampoo, (for Chadam road.)
2. Rushap, a little above the former.
3. Tuk-Sampoo, (for Burmeok, and Temi road to Tumlong and Chola.)
4. Lingjoo, just below Temi.
5. Bangsong, (for Temi road to Tumlong, the Raja's residence.)
6. Balla Samdong, below Gorrh.

At the Rungpo, I was met by the Lassoo Kaji, and the Lama of Pemiongchi. They were ordered by the Raja to come so far to meet me, and accompany me onwards; but I had come upon them rather

\* See further on for visit to Mainomchoo.



suddenly, as it was intended I should travel by the Burmeok route to the Took ghat of the Teesta, where the Dewan would probably meet me. The Kaji pressed me to halt for the day, and he had prepared sheds for me; but I find the Raja's officers manifest such an anxiety to delay me, that although I cannot clearly see the reason, I am quite satisfied it is for some tricky end that would not serve my objects in desiring to see the Raja, and I am therefore resolved not to delay until I am shewn some good cause for slackening my pace. Innumerable excuses are made about the bad state of the road, the propriety of mending them for me; and that this would have been done had more time been given, and indeed now it would be done if I would only halt a day or two, &c. &c. This road excuse is an unlucky one. It would take years, not to talk of days, to improve them. I therefore put the Kaji off by telling him that we were all hylanders, that the state of the roads was a matter of moonshine to us, but the provisions were a great thing. If he would furnish them it would be acceptable, but that I had nevertheless a good supply of my own for the present, and would take my chance of the road and proceed: I did so, and he came with me evidently vexed, but very civil. The Burmeok Kaji has sent me a very kind and friendly message, with oranges, rice, a kid, fowl, milk, eggs, and butter. He would come all the way nearly, 15 miles, to see me, but was ill; he was very glad indeed I had come this way; he was an old friend of mine; he and his father were old friends of my government, and above all he hoped to see me on my return, and would make a point of doing so whatever road I took. This is all very well; I have been exchanging civilities with the old gentleman for the last 10 years by long shots of sweet words, and small presents between his place and Darjeeling, and shall be right glad to find him hospitable in his own country. There is no part of the world I know of in which civil messages are better concocted than in Sikim, and pretty well for this in Bootan too. They always begin by a reference to the antiquity of the alliance between the raja and *Chiefs* of Sikim, and the Company; its closeness and durability is then touched upon, and its perpetuity insisted on. Yet not one Bhotia chief of Sikim, or Bootan, that I know of can pass a word on which I would put the least dependence away from sight, or easy reach. They have negative qualities of some use to their neighbours; they are not brave

or adventurous, but the reverse ; they shrink from violent measures, and I believe, that however much they might bluster to deter a solitary European unattended and unprotected, from travelling about the country, his person would be perfectly safe and inviolate. This relates to Sikim, and is a good deal. To me they are all perfectly polite and very well bred at present.

*Bansong Ghat, on the west bank of the Teesta River 9th December.*

—A very heavy march for loaded coolies and not an easy one by any means for the traveller. The road runs all the way along the west bank of the river over spurs, and across streams ; the general line of it varying, I think or rather guess, from 1 to 3000 feet above it. We started soon after day-light, and it was after 3 P. M., when the rear guard came in. I adopt a very useful plan—Naik and 4 Sepoys go with the fastest travelling coolies, and the Havildar with 4 more comes in with the last men. No deviation from this is admitted. Shortly after starting we crossed the Namfoke feeder of the Teesta ; its course is due east to the river, and about a mile or more further on we came suddenly on a very grand, and also a most delightful prospect. It is the basin-like valley of the Rungoom, a large and very rapid feeder of the Teesta. I wish I could describe the impression it made upon me as I first surveyed it : and it is not a whit less beautiful throughout its 3 sided circuit. On the North W. of it are the two peaks of Mainomchoo, 11,000 feet, their sides of bare brown rock, the ridges having numerous spikes of rock also. Forming the W. and S. W. margin of the basin is “Yangang,” which was above our stage of yesterday. The bottom of the basin is a mass of the richest foliage, through which 3 or 4 perpendicular masses of rock protrude themselves. Mainom is the first bare rocky-peaked mountain I have seen in Sikim. The effect of this solitary change of character in the scenery is very striking.

The view of Rungoom alone is well worth the pains of the journey from Darjeeling.

At the north margin of Rungoom our road is joined by one to “Yangang,” which leads viâ Daling Goomba to Islimbo, and also to old Sikim. Although many of the trees in the Teesta valley are of immense size, one we passed to-day surpassed them all. It measured 45 feet round, inclusive of 2 not large buttresses. It must be 35 feet round the solid stem.

At  $\frac{1}{2}$  past 9 reached "Neh;" the last part of the ascent to the ridge of this spur is excessively steep, and the path is overhung by a precipice as steep as the one on its lower side. The top of this pass is celebrated as the place whence the Goorkhas were driven back in their conquest of Sikim to the Teesta.

The Sikimites made a gallant stand here, rolled stones, and flew vallies of poisoned arrows at the enemy and succeeded in driving them back to Brom, which was the furthest point on the Teesta attained by them, and they never crossed it. It is 61 years since this event, i. e. it occurred in A. D. 1787.

The father of my interpreter, who for the remainder of this trip will be called "the Kaji," commanded the Sikimites on that occasion, and his son, although by no means disposed to be a warrior, is very proud of it, and well he may be. The annals of Sikim have no doubt their Wallaces and Bruces, if one could get at them. There is a Mendong at Neh, smaller than the Namchi one, and an upright stone against which travellers measure themselves and cut their mark on its edge; I overtopped all the marks by a very long chalk; at least 6 inches.

The maximum stature in Sikim does not exceed 5 feet 7. From Neh there is an easy descent to the Sungkoom, a feeder of the Teesta from the west, and after crossing a narrow spur the road descends to, and crosses the Mungshing. At  $\frac{1}{2}$  past 11 I had headed the line a good way, reached Turbolong, from which there was a fine view up the Teesta terminated by snowy peaks; crossed the Runnett at  $\frac{1}{2}$  past 12, a rapid and large feeder of the Teesta; and arrived at this ground, Bangsong, soon after.\*

The Teesta has a cane suspension bridge over it here; it is a good deal larger than the Rungeet, beautifully green but turbid and not very violently rapid. Its roar however is somewhat deafening, as I now write, and have to shout to my people instead of speaking. Water

\* I pushed on ahead of my people in the hope of getting across the Teesta and on to the Durbar before the Dewan arrived at the ghat, to perplex, delay and thwart my purposes, as I expected he would; but he was there before me, although he concealed himself; and when I came to the cane bridge I found its end fastenings loosened, so that an attempt to cross on it would have been certain death; I then went on to the Ferry, and here I found the raft moored on the other side.

boils at 209°. Temperature of the river 52°, at 3 and 5, P. M. Of the air in the shade at the same hours 70° and 62°. Thermometer without, black bulb in the sun at 3 P. M. 80°.

Last night at Lamfoke I had a long visit from my Mehmandar, the Lassoo Kaji. It was all directed on his part to induce me to halt and delay, to give the Dewan time to prepare for my reception on the Teesta; but I replied to all his solicitude that I should be perfectly content to meet the Dewan in any way and at any place on the road the Durbar that might happen; I find that the routes I compiled for Hooker are wonderfully correct considering all things.\* It appears that there is a lake of some magnitude on the road to Chola, and not far from that pass. Its water runs to the Teesta. There is also a lake near the Natolah Pass, and it is the source of the Natolah river, which forms the upper boundary between Sikim and Bootan.

At daylight this morning as I was leaving Namfoke I had a visit from the Lassoo Kaji, and the old Lama of Pemiongchi, a very picturesque old fellow, with a red mitre-shaped cap, red robe with yellow satin collar, and a long staff in his hand. Another wish to make me halt, although half my things had started, but of course that would not suit me. They then presented me on the part of the Raja with a bull, a large quantity of oranges, rice, turnips, bhanghans, and millet for beer. The oranges were distributed forthwith, and my fellows sucked them all the day. It is the height of the season for this fruit, and it must be very plentiful in this valley. All the people we meet are eating or carrying them; and they offer me some to eat, as I come along,—at least the Lepchas do. They are fine cheerful people, and well disposed to Europeans. I am improving my colloquial in their language. The Lassoo is of this tribe. He does not speak Hindustani or Parbutia, and is much pleased, amused—at my efforts. The index to peoples' hearts in the east is certainly through their languages. The coolies were cheered as we came along with my promise to slaughter the Raja's bull at the next ground, and it was done accordingly. The beast was tame enough after his journey, and made no objections to being tied to a stake; I put a pistol to his forehead, he came down at once, and then we had my cook, a Muhammedan, to cut his throat with praysers, so that the flesh was good for all hands.

\* See Journal As. Soc. for November 1848, for these routes and this pass.



The Lepchas minutely examined the pistol, which takes but a pea ball, then the beast's forehead, into which they poked a slip of bamboo, and putting cause and effect together, unanimously agreed that this was the best possible mode of slaughtering.

They are very clumsy at this sort of work\* with pigs and bullocks, they drive them mad with arrows, and when they are weak from hemorrhage, they hamstring them.† We have two cases of fever to-day. The Namfoke portion of the Teesta valley is notoriously malarious in the hot weather. I hope it is not so now.

There is a pretty little orange grove belonging to the Raja a little way from my tent, and a pine apple garden at one side of it, with a pomgranate tree in flower in the centre of it.

The orange trees are planted in clumps of 8 or 10, and are large and fine; north of this, in the Teesta valley, the fruit is said to be inferior to what it is southwards. "Wherever the flooded rice grows, there oranges will flourish."

10th.—Halt here for to-day. The Dewan of the Raja with two other chiefs arrived on the opposite side of the river past evening, and this morning the Dewan and I exchanged salaams across the ferry. He shot an arrow with a letter across to say that he hoped to come over to visit me during the day. He was attended by a retinue of about 50 men dressed in long loose scarlet jackets, striped cloth robes to the knees, conical caps of coloured cane work, with peacock feathers in front, bows in their hands and quivers at their backs. The chief was dressed in a light blue silk bukoo-wrapper, reaching to his ancles, a yellow sash

\* This pistol, the barrel of which is a portion of an American pea rifle of very heavy metal, and small bore, caused a great sensation, and the greatest envy among the Sirdars. The Raja's son and the Dewan both tried every means of getting it from me. The Dewan declared that with such a "*mulum in parvo*" he should feel his life safe anywhere, and he entreated of me, as I would not sell it to him, to get him a similar one at any price.

† The appropriation of the bull's carcase was rather amusing. I had bespoken a couple of the marrow-bones only for soup, and my man disjointed them as soon as the legs were skinned. The Lepchas I observed preferred the ribs to any thing else. The Moormies, I fancied, looked mostly to rump steaks; and the Bhotiahs without doubt affected the tripe, and other offal. Not a bit of the beast was left in 20 minutes except the horns. The Bhotiahs actually divided the skin, and ate it.

and black velvet cap. With the Teesta rolling in front, and the almost precipitous side of the Kumbulpoong mountain, wooded to its summit in the background, the effect was highly pleasing, if not grand. A hundred yards or so below the ferry is the cane bridge of which, and the land beyond, an artist would make a fine picture. The river takes a bend at the bridge, and this brings a low wooded spur of the opposite bank quite across it; over this spur, and in the distance to the S. E. is the Badong mountain, a fine mass of 6000 feet high at least.

On the opposite bank of Kumbulpoong, there is a spike of rock apparently 50 feet high. It is regarded as a natural Chaitia, and revered accordingly.

Hot to-day in my small tent, which is not shaded. Thermometer at 1 P. M. 72°.

*Kedong, west bank of the Teesta, 11th.*—The Dewan not having come across to see me by noon as he promised, and having no intention of doing so at all that day, as I had good cause to believe, I made up my mind to have him over in the speediest manner I could think of, and that was to announce my purpose of quitting the ghat on a trip northwards, until the arrangements for taking me across the river in progress to the Durbar should be completed. I announced this to Lassoo Kaji, and he made some objections to it, but said he would report to the Dewan.

The Dewan did not wish me to move for a number of insignificant reasons; and I believe that he and the Lassoo kept up a correspondence about it, shot across with arrows, all the afternoon. In the meantime I went on with my arrangements to start on the Lachoong road at daylight, and merely asked the Lassoo to give me a guide, who knew the road. When I went to bed he had not promised this or refused it. At daylight, when I was all ready to start, I was informed that the suspension bridge had been put to rights during the night, that the Dewan would be over immediately to see me; and that it was supposed I would then wait, where I was. I breakfasted then, struck my tent, gave the word to be off to the coolies, and then sure enough, the Dewan did come. I received him as I was, and we sat on the Sitringee of the little tent, which was still spread. Then came a host of enquiries about my journey, which had been so rapid and unexpected, a number of excuses for not ferrying me yesterday; a great deal

about giving me a proper reception at the Durbar, and many professions of friendship, beginning as usual with the "ancient alliance," and ending with the unalterable nature of it for the future. I was most amiable and acquiescent in all this, and to the expressed anxiety about my reception, I merely said that whatever the Maharaja might think worthy of himself on the occasion would be quite satisfactory to me. It was then agreed that as it would be necessary, according to the Dewan, to refer to the Raja before I went to see His Highness, and as this would take some days, I should go on a trip to the north along the Teesta, and return whenever the Dewan should send after me to say that the preparations for crossing the river were completed. He then appointed three men to accompany me as guides and cicerones, and I started, the Dewan coming with me as far as the Raja's orange garden, where he had a basket full plucked and presented to me.

We talked of shooting hare, when the Dewan gave me a broad hint for a gun. He examined mine, a borrowed one by the way, and also a pair of pistols, with which he made me show off my firing at a mark, and then tried it himself. We parted in mutual good humour: at least I was very well pleased to get away from the ghat for further travel, and he said he was well pleased at meeting me. I have not the smallest dependence on any thing he said. He is the most deceptive, and lying, of all the faithless Sikim chiefs and officials. He will mar my purposed visit to the Raja if he can.

We started at  $\frac{1}{2}$  past 8 A. M. and arrived at Kedong at 2 o'clock; all hands up and fairly tired. It is the severest march I have yet made in the hills, although far from being the longest. The general direction is north.

We came principally in the bed of the Teesta to the junction of the Romphup, a western feeder running due east. This took us an hour. Then up the bed of this stream for a mile or so, crossed it over on bamboos, and commenced the ascent of Lingkeang, a shoulder of Sungdampoong, which we attained after 3 hours and half hard work; it is almost perpendicular; the road, so to call it, is the very narrowest, and in many places it is rather alarming from the immense dip of rock on the lower side. In many of the narrowest places a slip would be inevitably fatal. No ponies to-day; left them at the ghat, and it is well, I did so; and none of the coolies carry more than 20 seers, which is just the load for easy and fast travelling.

From the crest of Lingkeang the view is very grand. To the north is still Sungdam, rugged, precipitously steep, and barren. The character of the country is evidently changing, and the first sign of it was in the peaks of Mainom, overhanging the beautiful basin of Rungoom. Instead of well soil-clad mountains, as at Temi, and further west, rockiness and scanty soil, with constant precipices, is now the character of the Teesta valley, and more so on the west than east bank certainly; at elevations above 5,000 feet there is scarcely any thing but rock, whitish clay slate, and gneiss. I have noted bearings from Lingkeang to the N. and S., "Sikim" to the south, and on this side of the Teesta, is the largest piece of cultivation we have seen. The fields are well railed in, and the ground turned up with the spade ready for wheat, which will be sown next month. This is full two months later than west of the Rungeet. The harvest it is said will be in May, as there. The vegetation on Lingkeang is not altered I think from that of similar elevations further S. and W. but about this place (Kedong) there is grass, whenever there are bits of soil for it to grow on,—and that is rare. We passed an old Lepcha, who looked half starved, and was turning up the scanty soil for a buckwheat crop. "Have you any cows, and can you give us a drop of milk," I said. "Cows!" was the reply, "there is nothing for them to live on here, it is all that the Thar and Ghoral\* can do to get a subsistence." These are really the only animals known hereabouts, and *they* are very scarce, nor are there any birds; during the two days, I was at the ghat, I did not see a single bird; and there is said to be no fish. The fishes of the Teesta on the plain are the best river ones I know of. The Romphup water is a drumly white, and carries down a very fine white silt from its source, which we saw at a distance, and is in a hill of apparently clay slate. All the other feeders like the Teesta itself are green and clear, and this is its character on the plains, where its water is unrivalled for drinking. We had a good view of some snowy peaks before reaching this place, The Powhunny of Waugh's chart I think. (See bearings.) We met a party of Thibetans going to Darjeeling; they were 10 days from Lachoong, which they assert to be to the east of the Lachen Pass. At Temi, we were told the contrary; and Hooker had a similar story told to him in Nipal.

\* Antelopes.



This question may be settled a little further on. There is no doubt, I now think, that both these Passes are to the west of Waugh's Pow-hunny. There is a stream of good water at Kedong, and just enough flattish ground to place my tent on; around it are fine large rocks under which the Lepchas sleep.

"The Koor," "Borh," and "Oope Palms," are very abundant on the Lingkeang ascent. No tree ferns, Oaks, and birches at Kedong. Water boils at  $200\frac{1}{2}^{\circ}$ . Thermometer in shade at 2 P. M.  $58^{\circ}$ . Temperature of stream  $54^{\circ}$ .

Started at 7 A. M. and after hard work over such a road as I have only heard described, but never travelled on, halted here at noon. All hands up half an hour after, right glad to find that I had reached water, and did not purpose passing it to make a longer march. Gorrh is the usual halting place. We got there at 11 A. M. and the Raja's guides in attendance tried to dictate a halt to me there, on which account I mainly pushed on to satisfy them that they were sent for my convenience, not for their's. They are very civil fellows on the whole, and do my bidding cheerfully. If they tell a hundred lies during the day, about the names of places, and other things which I have in my own knowledge, and by means of those who are with me, the power of correcting, it is the fault of their training, and I cannot help it. After an hour's walking with a good deal of ascent, and along a perfect precipice principally of solid rock, with loose stones here and there, we rounded the N. E. shoulder of Sungdam, and suddenly turning northwards, I was rewarded with a torrent of delightful emotions such as one but rarely experiences, and which form the sunny spots in the book of life, when they do occur. When we started it was cloudy, and threatening rain; sudden gusts of S. W. wind came violently up the course of the Teesta, and we were enveloped in dense mist. Despairing of seeing any thing for this day, and expecting to have to return to-morrow to the Dewan and the chiefs at the ghat, I early resolved to halt at Kedong. How glad I am that I did not, for on turning to the north the horizon was quite clear ahead, and displayed a noble view of the snowy mountains. The Teesta valley running due north, seemed to penetrate deep into the range, which looked close to us, and semicircles of snowy mountains flanked it on the east and west. It was more than beautiful, a fresh and bracing

breeze came blowing right in our faces, the nearer hills on either bank of the river rising from its bed from 6 to 7,000 feet, were bright in sunshine; all around was indisputably grand, and I was perfectly happy.

The road from Kedong to this shoulder of Sungdam, which is probably from 5 to 6,000 ft. high, runs mostly on a narrow ledge of rock, with the Teesta on the right, and perpendicularly below you; the peaks of Sungdam overhead and of bare rock, a variety of long grasses occupy the soily portions of the mountain side; and at the shoulder there are some stunted trees of the scarlet *Rhododendron*, Alders, and the handsome yellow *Daphur* now in full flower. The bark of this plant is as tough as that of the real paper plant;\* but it is not used, I believe for that purpose. It abounds all the way to Tukbrum, where it is a good sized tree.

From Sungdam shoulder, the road descends very steeply to the Rett or Ronglo, a rapid stream running east to the Teesta, crosses it, and ascends precipitously to Gorrh, we come through barley and wheat fields just above ground, and then along more rocky precipices to this place. I believe that my route to Lachoong,† which gives the road as descending to the Teesta at Gorrh, is quite correct, but there is evidently a great jealousy with the Sikim officials of our crossing the Teesta, and as I satisfied myself at Gorrh, that the snow may be reached or nearly so by the left bank, I did not press hard questions about the ferry, and came on.

The Runkoom, an eastern feeder of the Teesta, joins it opposite the foot of the Sungdam shoulder; and the Rungmon from the E. by N. coming from the snowy peak, noted yesterday as Powhunny, joins it nearly at the same place. At Tukbrum is a feeder of the same name, which comes down in a cataract over the rocky valley of its bed, and roars as loudly as the Teesta itself at Bangsong. On the east bank, and north of this is the Rhato; and from the west, and between Tukbrum and Rahlang Ghat, is the Nukdung, and some other feeders of which I have not the names. At Rahlang the Teesta takes a turn to the eastward, and it is the Rieng which comes due south from the snows, and appears to be the north source of the river. To the north-east of the junction of the Rieng it is joined by the united streams of

\* *Daphne* also.

† *Jour. As. Soc.* for November, 1848.

Lachoong and Lachen ; to the N. and west of the latter of these, its own source is in the snows, and far east of Kunchinjinga.\* I have made incessant enquiries as to the possibility of seeing Kunchinjinga from any of the mountain tops hereabouts, but it is universally said that it is not visible, that mountains partly snowed, and not snowed, intervene. The people at Tukbrum point a little S. of W. to the situation of Kunchinjinga.

The people hereabouts and onwards to the snow are Lepchas and Bhotiahs mixed ; all the way from Bangsong they look starved and miserable. No wonder ; it is a sterile land,—rice does not grow, and they live it out the best they can by bits of wheat, barley, murwa, and buckwheat cultivation among the endless rocks. On the east side of the Teesta it is better, and there are some nice looking farms occasionally seen from the river upwards to 5 or 6,000 feet. They are generally fenced in, and are for the most part permanently cultivated ; the Lepchas not being so erratic on the Teesta as on the two Rungeets, the Balasun, and Mechi. The manuring is done solely by penning the cows in different portions of the little farm. They rarely have pigs, and fowls even are scarce, goats unknown, and so are sheep. Darjeeling and its free expenditure of ready cash has wonderfully ameliorated the condition of the people who resort to it and live near it. This was well described to me yesterday as we came through a wretched field of buckwheat. “Here a man cannot exist unless he grows something, however bad, from barren soil ; at Darjeeling he can live well on good rice, and not cultivate at all. There, leaves, bamboos, rattans, and all sorts of yams, and vegetables will fetch him money. Here there is no money, and little to sell if there was ; so the people are starving ; grass is used for thatch hereabouts instead of bamboo.” There is a Cartus tree here, the first ever seen by my Lepchas, and the first by me in Sikim, also some tobacco plants, but of no use.

Water boils at 204°. Temperature of air at 1 p. m. 60° ; of water 56°.

\* P. S. I leave this exactly as it was noted at the time, but when at Mainomchi with Dr. Hooker, I came to the conclusion that the feeder of the Teesta which I call the “Rieng” is the proper source of the Teesta. If Dr. Hooker succeeds in getting to the Lachen and Lachong passes, we shall have accurate information on the sources of the Teesta.

I have a letter from the chiefs at the ghat to say that the Raja has written, and wishing me to return, which I do to-morrow according to my promise. I wish they would keep their's to me in like manner.

*Kedong, 13th.*—Last night at Tukbrum at 9 o'clock the sky was lowering heavily, and threatened rain. The Thermometer stood at  $54^{\circ}$ ; a great change at this elevation in 9 hours. But it had snowed heavily on the peaks to the northwards; was now bright and clear, and a gentle northerly breeze was blowing. I do not know if the proximity of Tukbrum to the snowy range at all affects the variations of its temperature, but the rapid descent of it last night is, I think, unusual. It was with great reluctance that I turned my back upon the snow, and even as I did so I was half irresolute, for yesterday I had encouraged dreams of further delays at the ghat, and of my reaching the snow, before the summons of recal should overtake me, but I could not help it; it is reported that the Raja has come in person to the river to meet me, and it would not do to keep the sovereignty of Sikim kicking his heels for me, in his own dominions. I wish most heartily that he had staid at home, and ordered me to the presence at Tumlong. Besides the pleasure of a couple more marches in new places, I might have got to the lakes of Chola, which are the newest of all the new things I have lately heard of. They lie, one on each side of the road near the Pass, and on this side of it, and two day's journey from the Durbar.

The road to-day seemed rather better than it was yesterday, and constant travelling over the like of it might reconcile you to it, and even lead you to defend it, as a thing you had a property in. This is a very common feeling with people in India about their stations, officers, &c. &c. But it was not a whit the less terrific along the face of Sungdam. It is a mixed mood of elation and depression to find yourself for an hour together moving on a ledge of rock which is sometimes not more than 6 inches broad; a rocky wall of 1,000 feet over your head, and below another of 4 or 5,000, with the certain knowledge that a single slip would in a few seconds bring your earthly progress to a close for ever.

At the Ronglo stream we saw about a dozen large bee-hives on the face of an inaccessible precipice. There was a village near, but the people could not manage to get at them, as there was no tree above



the precipice to which they could attach a rope, and thereby descend to the hives, as is the fashion to do in like cases. These were the large black bees of Sikim, with a little yellow below the wings. They are called "Vott" by the Lepchas, "Piabeany" by the Bhotiahs. Their honey is pretty good; the quantity of wax they yield is very large. The small bee of these hills is like the English one. The Lepchas call it "Hoo," the Bhotiahs "Seviang." Its honey is very fine,—its wax very little. The honey of both species is intoxicating while the white *Rhododendron* is in flower, and they feed on it, i. e. in April and May. The Pupa of both, as well as of a very large black hornet with yellow head, are much prized as a delicacy in Sikim.

*Bangsang, on the Teesta, 14th.*—We arrived here from Kedong at 11 A. M., having started at  $\frac{1}{2}$  past 7. It was very pleasant to tread the bit of level road near the ghat, after 4 days of incessant climbing and descending, not to speak of sleeping off the level; for the Machan is always higher at one end, and mine on this occasion had by no means an even surface, being made of sticks instead of bamboos. I have pitched my little camp in the Raja's orange grove, and cleared the jungle that shut out the view of the river. It is a fine spot of 2 acres, or so, quite level; the river rolling in front, and Sungdam rising precipitously behind it to 6,000 feet at least. On my arrival the Dewan met me, and took me to the house he has fitted up for his quarters. His reception was polite, and almost kind. His enquiries about my trip very amusing. Why or wherefore I went such a road without direct necessity he could not yet understand; nor could he at all sympathise with me in my expression of pleasure at what I saw. The end of the house was fitted with a bench raised about a foot, on which was spread a rug of soft carpetting, blue and white, and of Chinese or Thibetan manufacture. On this he insisted I should sit alone, he taking another carpet on my right hand, and some paces down the room. Between us on the floor were his devotional implements, and on the bench beside him a Thibetan dagger with silver handle, and an English pistol. The walls were hung round with white and coloured furs and sheep skins, China satin bukoos, (cloaks), a shield, and 4 or 5 enormous China hats of white straw, or matting, lined with blue silk and studded over with worked silk figures of butterflies, &c. About a dozen dirty brawny fellows in blue or purple long woollen wrappers, loitered out

and in the apartment, and two fat Lamas occasionally muttering prayers and counting their beads completed the group. My host's ponies—3 good ones,—were picketed close to the door. A high peaked tartar saddle, and a lower peaked Chinese one, lay in a corner of the room, and the whole menage had a much more Tartarian appearance than I have ever met within the hills. We talked on many subjects; horses he is very partial to, and he drives a trade in them besides, between his own country and Darjeeling. He asked about our extraordinary anxiety to visit the snows, and other questions regarding the Himalaya, and was greatly astonished at learning that it extended from the Indus to the Burrampootur, and that we knew something about it throughout this immense tract. He made what I believe is a true remark, that this is the nearest way to Thibet from India. It was not from him I expected this corroboration of my own notions. After regaling myself with a good pull at a Choonga of quite cold Murwa beer, and some oranges, both of which were most grateful after the hot walk from Kedong, I took my leave. He visited me at my tent during the day, and we are very amicable. At his visit he said he would follow the fashion of Thibet, by presenting me on the first occasion with a tray of yams,\* some dried plums, a side of yak beef, and two haunches of venison. That after the same fashion it was his duty, and he would like to provide my meals regularly as long as I staid with him, but that as he had come very hurriedly he could not do this; but would request permission to send me such provisions as the country afforded. I replied, that he was unrivalled in these parts for his acquaintance with Thibetan manners and usages, which in the present case were very hospitable and agreeable. I shall probably have a much more respectable sort of offering during the day, or to-morrow, for these Sikimite officials are on all occasions pertinacious holders back in their civilities as in their official acts, opening out with extreme caution, and always with seeming reluctance, even when their politeness is, as in this case, quite voluntary. I am informed that the Raja is engaged in some unavoidable annual exercises of religion, which will occupy him till the

\* This yam is like the radicles of a larger root, not thicker than a quill; brown, and like Ipecacuani, crisp white, and sweet, and is eaten raw, as well as boiled. It is called "Somah;" the plant is said to be a creeper, and not unlike the yam plant in Sikim.

new moon, (a fortnight,) and will write to ask me to meet him next cold weather. In the morning I heard that he was at the ghat waiting for me.

We shall see how it is to be arranged. Meantime as before, I believe nothing I hear regarding his movements or intentions.

*Bangsong, 15th.*—The Dewan and the Lassoo Kaji arranged with me, last night, that I should remain here for two days, in the course of which I should know exactly what the Raja was about. They know well enough, but will not say; and the Dewan's system of secrecy is so complete, that it is in vain to try among his people for correct information on the subject. I require a day's rest, and so do the coolies, who have been with me to Tukbrum; I also hear that Hooker has penetrated into Sikim, on his return from Walloongehong, and is making for me here. I should like exceedingly to have him here at all events, and if the Raja comes, it will be more of Sikim for him to see than he will again have any chance of. I am not obliged to be back to relieve Mr. Kemp, who is so kindly carrying on my office for me, till 25th, so that I shall wait with pleasure for the time specified. It rains to-day, and threatens a continuance, I fear, but as I have 40 Lepchas with me, we soon housed all our party. The plaintain leaf, *fresh*, is an excellent thatch, and it is very abundant here; so is the Oopi palm, which the ponies prefer to the bamboo, or any other leaf I think. At noon the Dewan called, and as I half expected, he came out stronger in the hospitable line than he did yesterday. He presented me on behalf of the Raja with a yak, two Thibet sheep, two loads of rice, two quarters of mutton sun-dried in Thibet, some Lassa Macaroni, milk, yams, a piece of yellow China satin, and a pair of Tartar boots, drab lined with pale blue. I gave his people, who brought the largess, 20 Rs. When he left me he said that the Raja was on his way here, and he actually went across the river to prepare shedding for his royal master. If this be true he must have known of it last night when he told me that all sorts of things would prevent the Raja from coming. First, there was the religious exercises. 2nd. His extreme old age, (he is 70.) 3rd. The road to this ghat is not fit for Doolie travelling. 4th. The time for preparation was so short. 5th. The Lassa people might be jealous, and alarmed at his coming to meet me, and prevent his going to Teshoo Loomboo next year. 6th. When he met Colonel



Lloyd at the Took Ghat, 12 years ago, the meeting took two years to arrange; and, lastly,—yet I think that was the last reason,—the Bootanese may be jealous, and annoyed at his friendliness with me, and come down upon him for it accordingly.\* Certainly this Dewan is the aptest story-teller I know of,—a pattern minister, I reckon, for a Bhotia Raja. His qualifications may get him promotion across the snows, and I hope he may get it soon. I think he is not likely to come by much honor in his connection with the British government; as yet he has always done the reverse.† I am right glad for the sake of my temper, and patience that I am not entrusted with any special matter of business to be transacted on this occasion; as it is, I can wait to see the end of his lies, and be none the worse. I have information however, which leads me to think that his position is just at present none of the easiest to maintain; and is a precarious one for the future. He is not at all in favor with the lately married Lama, the Raja's eldest son, and who is now acknowledged by all the chiefs and people as the heir-apparent. If the old Raja dies before the son, farewell to the Dewan-ship of my hopeful host. He got his present influence over the Raja, through the ladies, one of them a relation of his wife's, and by alienating the Raja from his eldest son, to whom he has not even spoken for years. The marriage lately effected took place in spite of the Dewan, and was all arranged in Thibet by Aden Chiboo, his enemy, the right hand man of the heir-apparent, and the present destined Dewan for the new reign; but he puts his trust in princes, and has a crafty fellow to deal with in the meantime, and that is the present minister, who is backed by the Raja, and all the female interest of the household, in his purpose of putting the illegitimate son on the throne at the death of his father,

\* To all this, I replied, that I needed proof of the Raja's own inability or unwillingness to see me, and that I would wait for it at the Teesta, or go to the Durbar, if he would let the passage of the river be as free to me as it was to every one else.

Late at night he sent me a letter bearing the Raja's seal, and dated from the Durbar, in which he excused himself from seeing me! I pronounced it to be none of the Raja's, and avowed my purpose of regarding it as a manufacture of the Dewan's until I had assurance from the Raja of the contrary. This resolve decided him on leaving matters alone, and he accordingly produced the Raja, who at the very time I got the letter had been two days en route to the ghat to see me. The purpose of the Dewan was to drive me away in anger at the Raja.

† See Review of Sikim Politics, Nov. 1846.



and thereby securing to himself the continuance of his ministry. These are all and singly even sufficient to keep a new man, who rules his fellows more by force of favoring circumstances than from superior talents, on the *qui vive*; and doubtless my affairs, as they are not very pressing, are held inferior to any of his own. If furthering my wishes could materially serve his own purposes, I might through him accomplish something for the more satisfactory transaction of business with Sikim; but it is not so; and if I do not see the Raja, or seeing him, do not find that he is able or willing to amend matters, I must wait for some other opportunity or try some other mode of bringing this about. As it is, a great point has been lately gained in the permission to Dr. Hooker to return by Kunchinjinga, and by the facilities given to my own travelling in Sikim.

*Bangsong, 16th.*—Heavy rain all last night. The river has risen a little, and although its waters are still green they are turbid, and the pace is quickened. It is always a matter of deep interest to me to watch the endless current of a stream, however sluggish, to the insatiable ocean. But the headlong course of mountain torrents, equally unceasing, I can never look on without feelings of great wonder. How is the rate of these currents ascertained: I have never met with any observations to this end.

While waiting for breakfast this morning I saw the Dewan, whose house is close by, having his ponies trotted up and down, with their grooms mounted, over a piece of rocky and rough ground just in front of his door; I joined him, and we talked of horses—a very favorite topic with him, and of which he has some curious information;—I asked if he knew the Giangtchi breed of Thibet, which is a favorite with the chiefs in Nipal, and if it was not a very good one? He said, “I know Giangtchi well, and the ponies you allude to, but they come from a long way east of that place, although the Nipalese may perhaps buy them there. They are very fine ones. There is a lake in their native district out of which a noble stallion was produced by miraculous means. He passed a season on its bank, and this is the origin of the celebrated Giangtchi blood, and there is no better in Thibet.” I remarked, “that the bit in the mouth of a fine colt that the groom was awkwardly shewing off was too severe, as it was bleeding.” “Oh no,” he replied, “it is not *his* blood, it is what he has just been eating. Pig’s blood, and

liver, that he has every morning in the cold weather!" Come, thought I, this is coming a little too far north of my zoology, but I was wrong; a brass basin was brought from the stable half full of raw blood, and bits of liver, the man dismounted, unbitted his nag, and the beast ate the horrid mess with evident pleasure, and seemed quite used to it. This is always done in Thibet, while the horse is growing, by those who can afford to do it, and it is said to greatly increase the fire and enduring power of the animal.

When travelling, animal food, fresh or dried, is always given, and on this diet the condition is maintained under the severest work. In the warm season oil and eggs are substituted for the blood and liver. "Will you sell me the Hubshee colt, Dewan Sahib?" "No, I cannot," he replied. "He, and that little bay are dedicated to the gods; but the mare in foal, and the chesnut are for sale." The gods have much the best of the Dewan's stable, and *he* takes good care of, and good work out of their property. It is the usage in Sikim to consecrate some animals of all sorts belonging to you (except the dog) and these are never sold nor given away, so that I cannot buy the young Hubshee,\* which is a very good one.

The Dewan's huntsmen, and dogs have been out to-day for deer but it is a blank day. They started early to the brow of the hill just above our encampment, which is 1500, or 2,000 feet higher, and covered with a thick forest of palms, plantains, bamboos, and other tropical plants, and they beat it all down to the river without a find. The day before I returned from Tukbrum, they were more successful in the same locality; they drove a Rutwa right through the sleeping place of my guard, into and across the Teesta, the men and dogs followed on the bamboo raft used at the ferry, he took to the hill, but they hunted him again in the river, which he recrossed; and was killed on landing. I had mince collops of the haunch yesterday, which were delicate, and fine-flavored. The dogs all give tongue, when they are close upon the chase; but out of a pack of a dozen it is reckoned good if more than a couple give tongue upon the scent. In the warm whether the deer when driven to take the water often swim down for miles, keeping the middle of the stream, and thus escape their pursuers, but in the winter they cannot stand the cold of the water and rarely do more than cross

\* Hubshee, African, so called from the curly hair of this sort of poney.

direct. The temperature of the Teesta to-day is  $52^{\circ}$  ; of the air in the shade  $62^{\circ}$ . Weather still cloudy and threatening.

*Bangsang, 17th.*—After my hunting entry of yesterday, the men took a fresh cast into the forest south of my tent, and between it and the suspension bridge. In an hour there was a great deal of whistling, shouting, a rush of bow and arrowmen past my door, and the dogs were in full cry at some distance. I followed the crowd down to the river gun in hand, but a horrible pair of thick-soled English shoes put on for the damp of the morning quite crippled me in scrambling over the immense boulder of clay slate, which are quite polished and very slippery from the action of the water in the rainy season, which raises the level of the river 15 or 20 feet more than it is now. The deer however, soon driven out, took to the river at once, and was swept rapidly across to the other side, where the Dewan was preparing for the Raja's camp, and shot him. The blood was brought over in a small Choonga for the colt, and the venison sent to the kitchen.

At daybreak this morning, the hunt was off again ; they crossed the river to beat the opposite bank, and about noon, there was great shouting and whistling, and a rush of people to the bank. All eyes were directed to a landslip, opposite which was a perfect precipice of loose rock and stones ; and here it was said the deer would issue. Sure enough he did so, and jumped into the foaming stream most gallantly. The Dewan, the Kaji, and I had guns loaded only with shot. All the others had bows and arrows. A volley was fired at the deer as he swam down with the current, but no mischief done to him by any of us. He put back to his own shore, swam strongly up the eddy along a ledge of rock until he found a landing place, and then took right up the hill just as the dogs and his original pursuers reached a point of the river 100 yards above him. The swim must have refreshed him, for he was not found again.

It was a good sight to see my ally, the Dewan, running over the huge and slippery stones to get a shot. He was barefooted, and that helped his paces : but his figure is fat and buncchy. His dress was a fawn coloured figured China Satin Bukoo, down to his heels, and lined with long woolled, white sheep skin ; his head was bare, with a queue to his waist, and this with a green and gold Nipal Chatta in his hand, gave him any thing but a sporting look. I laughed, and could not

help it. He did so too very good-naturedly, and complained of the heat of the sun in these vallies. He was full of eagerness, and as joyous as a boy. In spite of his official quibbles and deceits there is something simple and pleasing in his manners, and I dare say that if we were on a hunting party only, and I was to reproach him with all his falsehoods he would say they were "quite Pickwickian," i. e. Ministerial.

The preparations for the Raja's arrival are going on briskly to-day, and he will be here to-morrow I believe. Strings of goats and kids are coming in. Firewood is being collected in heaps. The sheds are almost ready and people are hourly arriving to see the fun ; more than all, the Dewan sent to me this morning for some soap to have a regular scrubbing, I take it, and I sent him my only spare cake of brown Windsor, my bearer remonstrating, and saying that Dhobies' soap would do as well, and so it would ; but there is not a bit even of this among us all !

Heavy rain last night again, and it is still cloudy. This is hailed with great pleasure by all the people along the Teesta, as it is just at the best time for the young wheat and barley crops. The small range of the Thermometer is remarkable in this situation,—all day yesterday it only varied from 58° to 62°, and at 6 P. M. and 6 A. M. this morning it stood at 59°.

There is no saul along the bed of the Teesta as on the Rungeet, and oaks abound ; together with a profusion of the three palms already noted, bamboos and plantains at the river edge. The chesnut and wild mangoe are in the same locality. The wormwood which infests the abandoned clearances up to 4000 feet in all parts of Sikim that I have seen, is collected here as food for goats ; and they devour it greedily. There is a tree very common here, the outer bark of which is quite smooth and shining, and of a light stone or nearly white colour, it is the "Seling Koong" of the Lepchas, and peculiar powers are attributed to it. If a woman in the early part of her pregnancy touches the bark, her offspring will be fair and finely skinned like this tree. The leaf is like the toon and ash ; it is not now in fruit or flower.

*Bangsang, 18th.*—The Raja arrived on the opposite side of the river about 9 o'clock this morning. About 7, while I was dressing, the Dewan came to me to say he was off to meet his Highness. He was



accompanied by the Gantoke Kaji, and 3 or 4 other minor Sirdars, and had an escort of a dozen Lepchas armed with muskets, and dressed in long scarlet jackets, conical caps with the peacock feather in front, and black cross and pouch belts. The party looked very striking crossing the river on the bamboo raft manned by half a dozen wild looking Lepcha ferrymen. The raft here is pulled straight across the stream. There is a rope of 4 or 5 ratans stretched across, and fixed on either bank, by which the ferrymen pull the raft.

This is quicker than the plan on the Rungeet, where it is pulled across by a party on each side with attached ropes. In this way the raft is each time carried some way down the stream and has to be pulled up to the landing place. The ferrymen here and on all the ghats of the Teesta are so by an hereditary tenure. They can reckon 100 years of it here, from father to son. They get no pay, nor any ferry fees, but they are exempt from payments of all kinds, whether in money, grain or other service. All the ferries are exempt from transit duties on merchandise, &c. except the Katong one, and there although the levy is irregular in amount, it is not heavy. It is generally taken in kind on goods.

The system of Begarree (unpaid carriage labour) is the law of Sikim everywhere, and it is managed on a plan by no means harrassing to the people. There are fixed stages beyond which the people are not expected to travel, and they do not generally exceed two days' journey with a load. A man is therefore rarely more than 3 or 4 days at a time away from his home on these occasions; but he has to provide his own food, and the frequency of the calls upon him are quite uncertain.

This has been a very busy day indeed at the ferry. All the provisions for the Raja's party are sent by the Dewan from this side, and all the people from the country between the Teesta and the Rungeet, as well as westwards to the Nipal frontier, are flocking in to make their salaams to the Raja. It saves them a longer trip to the Durbar; besides it is a great novelty to find his Highness in this part of his territory, which he has not approached since 1837-8, when he met Colonel Lloyd at the Took Sampoo, 30 miles or so, south of this.

The provisions do not look very tempting as they pass by, but Bhotia cookery may do much for them. They consist of great sides

and rumps of yak, and bull beaf, carried on the greasy shoulders and filthy heads of Bhotias, who *never* wash, and who wear a garment from its making until it is in rags, and shining in every part with the friction on sweat and dirt. Then there is butter in great quantities rolled up in leaves, and tied with strips of bamboo. This is cleaner, but peers out occasionally covered with dust, and in contact with the carrier's neck or arms, which is very sickening. Pigs, goats, kids, milk, fowls, eggs, sun-dried mutton, venison, rice, fermented murwa for beer, spirits, oranges, and plantains, I think complete the list. All good things enough, but the touch of a Bhotia ruins all in my estimation, and the recklessly filthy way in which they keep their food, and carry it about is altogether disgusting.

I have all day been an object of great curiosity to the new arrivals, very few of whom have ever seen a European before. Immediately the Raja arrived his followers came down to the opposite shore in groups to take a peep at me across the river, and after having seen me at the long range for some time, they would cross over, approach cautiously at first, salaam, and then commence their closer scrutiny. The texture of my coat, the bit of velvet on its collar, my pantaloons, and shoes, were all carefully touched and examined. One would say they were Chinese, another, Calcutta, a third neither one nor either. Then it would be asked, "Is the watch chain of gold, and the pencil case, and the ring." All being handed round, and examined, the parties passed on to the little tent, examined the bed, the table, its cloth, the chair, the gun, the writing materials, and this was all it contained,—and to conclude their survey, the little kitchen close by, the saddles and ponies had their full attention. 'This sort of thing continued all day. Never was a wild beast at a country fair more run after, or sought for than I have been since morning. With all this intrusion and with the most familiar conversation going on between us all day, I did not once meet with the slightest rudeness or impertinence. The Lepchas are such cheerful fellows that even with the little I can speak of their language, I could raise a hearty laugh among them in few words, and often did so. The Bhotias are much more grave; but they join generally in cheerfulness, and were equally devoid of offence or annoyance, although quite as inquisitive.

The Maha Ranee is with the Raja. She is rather young I hear, and

rode astride on horseback, when he travelled in a doolie ; occasionally riding a mile where the road admitted of it. Her women, and many others came during the day to the ghat to look at me, but none of them crossed over. Many women from this side took the usual survey of me, and all my chattels.

While walking out last evening, I came on a party of 8 fine young Lepchas on the river-side near the cane bridge. They were engaged at quoits, and after some talk they asked me if I would take a hand ; I did so, but did not make much of it. The quoits are thick pieces of slate weighing a seer or more, selected at the time, by the players. The distance is about 30 feet, and they deliver the quoit with a rotatory motion as we do. Each player has two quoits ; and the number of players equally divided for a match. We played at the stump of a small tree, at the root of which a peg was driven into the ground. If a quoit rests on this peg it is equal to a ringer, but if an after one rests on the first it alone counts, the first ringer being superseded and cancelled. We then had a turn at putting the stone, at which I beat them, all easily, when I saw the best they could do. They practise with "putting" a heavy and "drawing" a light stone, just as we do in the highlands of Scotland. They attributed my victory to my greater stature. There is something in that no doubt, but much more in having the knack of the game from childhood.

After the Raja arrived, I wrote to say I was glad to hear of his safety and well-being from the Dewan, and that I had been hereabouts for 8 days. Soon after the Dewan and Aden Cheboo Lama waited on me with the Raja's compliments, and said that a propitious time was sought for for my visit, and that as soon as it was known, I should be informed. It was my extreme pleasure, I said, to await the Raja's convenience, but should be glad of an early audience, if it so happened.

We then had a great deal of talk on sundry subjects, and they took their leave.

19th.—The astrologers have made a very happy cast in my favor, for it is announced that all is arranged for my visit to take place to-day at noon. This a happy exercise of enlightenment in an occult science. All is bustle and preparation over the way ; the ferry is plying at double tides, and I am getting a few attendants made as clean as possible to accompany me. This is not easy, for we have been a fortnight out, and they have had no washings.



For the present, I close my journal to put on my own best for the occasion.

20th.—I was summoned to the presence at 1 o'clock yesterday. The Lasso Kaji came to escort me, and I crossed the river on the raft with my own Kaji, a Moonshi, 3 orderlies from the guard, and a couple of Chapprassies. There was some demur at the ferry to my taking the Sepoys. "Colonel Lloyd had none, none had ever crossed the Teesta before, the raft would be overloaded, &c. &c." I remarked that they were merely my personal attendants, being unarmed; and that if there was a real objection to their going across, it should have been made before I quitted my tent, and not actually on the ferry boat. After a little delay and consultation, in which I took no part, we were pushed off. The river is about 100 yards wide here, very deep indeed, the stream smooth, and water clear and green. We had about 500 yards to walk to the place of reception. On nearing it, the Dewan, very handsomely dressed in a light brown Satin Bukoo, and a large deep fringed crimson cap, came down the bank to meet me. He said that the Raja was all ready to see me, and that the visit would be entirely formal. I had previously asked if I should introduce any matter of business on that occasion. The reception room was a temporary building of wood raised on posts about 4 feet from the ground, with walls of split bamboo and a roof of green plantain leaves. The inner walls were hung round with drapery of crimson and gold China Brocade, figured principally in dragons and moons, which gave the apartment a subdued light, and a Chinese character. At the further end from the entrance was a temporary throne covered like the walls, 6 feet high at least, with steps leading up to it; on the top of this, and well back sat, the majesty of Sikim, a little old man with sharp and rather regular features, and fair complexion, dressed in a yellow satin robe, and a little yellow sailor-like hat, over the crown of which hung a profusion of scarlet fringe. On the right, and standing like draped statues against the wall were 4 fathers of the Church, viz. the Lama of Pemiongchi, a Lama, an illegitimate son of the Raja, the Raling and Rumtick Lamas; they were all dressed alike in long robes of purple blanketting; their heads closely shorn, not shaved, and all were steadfastly counting their beads. But for the slight motion of their lips in counting, they might have passed for inaninate fixtures. Below the



Lamas came the Gantoke Kaji and other chiefs. On the left, close to the throne, and between it and the wall, stood two very fine looking young men handsomely dressed like the Dewan ; they were brothers of the Ranee, Thibetans, from Turding near Digarchi, where their father is a respectable chief. Then came my chair, and beside me stood the Dewan and Aden Cheboo, who interpreted for me. My own Kaji, Moonshi and other folks of whom I know not any thing, completed that side. No one sat in Durbar, but myself, and there was not a person inside or outside the walls, who wore arms of any kind ; I never saw a more peaceful looking collection of men in my life. There was an unmistakeable and undescribable quiescence over the whole party that was very striking. It was clear at a glance that the genius of Lamaism prevailed here over all things, and I now fully appreciated what had often perplexed me, that was the manners of the Sikim Sirdars approaching so often to stolidity and abstraction. It is the mannerism of a priesthood, widely spread and deeply percolating the higher classes of the laity,\*

The conversation was set and formal, but quite friendly. "Did I meet with any mishaps on the road ? Was I well ? How was the Governor General ? Was all well at Calcutta ?" and some other common places. The Raja believed I did not speak his language (Thibetan) and this constrained him to use an interpreter. This last however was very pointed, and I expressed my extreme regret at the fact ; but hoped that his Highness would excuse it, and kindly listen to any thing I might say through another person. Then came my turn. This was a day I had long wished for ; and it was now my happiness to express in person the friendly feelings of my Government for the Raja, and to shew as much as I could, how fully I participated in the same myself. The Raja replied in all sincerity I think, "The Company and I have long been friends, are so now I hope, and will always continue so." Then passed some formal questions and replies, about health, and the journey, in the course of which the Raja said that his age did not make him a good traveller now, and that he had been ailing, but the journey, in his desire to meet me, when he heard I was so near, had done him good instead of any harm. Then came in 3 trays of dried

\* It is mannerism only, for they are sharp enough when self-interest or other pressing matters rouse them.

fruits, which were presented to me, and I begged his Highness to accept a few things from myself which were in two trays on the floor, and I took my leave. There was an apprehension on his part, I think, that I would suddenly come upon matters of business with him, of which I had no intention then, and I told the Dewan so. Before starting to the visit I was told that Colonel Lloyd, to comply with the usage of the Raja's Durbar, had presented his sword, which was the only thing he had with him, that it was given back to him, and that if I would present something in conformity to the usage, it would not be returned either. I said at once that I had no wish to disturb the usage, and that a few things I had brought should be presented after my visit. I took the articles\* with me on two English tea trays, intending to present them on coming away, but they were smuggled in ahead of me, and lay on the floor during the visit. I do not grudge the Raja the satisfaction of putting me down in the annals of his house, as a bearer of presents on visiting him.

In the evening the Raja sent us the materials of a feast, consisting of two yaks, 8 fowls, 5 loads of rice, half a maund of yak milk-butter from Thibet sewed up in yak skins, a skin of tea, a bag of salt, some spirits, oil, milk, garlic and radishes. This amendment on the dried fruits was on the ruling principle in Sikim, which is to mend your manners, and improve your presents by degrees. It is a standing maxim in this country *not* to put "your best foot foremost," and an equally prevalent one "to hurry no man's cattle." Don't shew a leg at all if you can help it, is the rule, but if you have to shew, let it be reluctantly and very slowly. At best it is an ungainly foot when it is produced, and ungraciously done always, but it is not a cloven foot I think. With all their obduracy, reserve, jealousy and some alarm in contact with Europeans I would not at all look for treachery at their hands, and this is a redeeming point in people of their grade in the scale of civilization. So much is it the habit to hold back, that it is good manners to wait on the Raja for the first time in your worst attire, and you never ought to present any thing but the meanest trifle in food, or otherwise, on the

\* Two English tea trays ; two Scotch plaid shawls, 3½ yards of scarlet broad-cloth, a canister of snuff, a cut crystal decanter, 3 strings of large imitation amber beads, a pair of Britannia metal dishes, and some Derbyshire spar table ornaments, value in all about 70 Rupees.

first occasion. If the intercourse goes on, improve your manners, and your presents. That is the etiquette. I expect Hooker here in a couple of days. I was anxious about him lest he had been caught in the snow in the late bad weather, when crossing the Kanglanamo from Nipal. The Dewan knew of my anxiety, and had some days ago sent off to the frontier for intelligence. To-day he came running down to my tent with a letter from Hooker to me in his hand, and was quite pleased at my satisfaction in receiving it. He is like other folks, an odd compound off business; he can be quite pleasing almost, and engaging. He tells me that the wild yak in Thibet is larger than the wild buffalo in India.

“The lungs alone are a load for a tame yak, he is quite untameable and horridly fierce, he falls upon you with his chest, if he catches you, and rasps you with his tongue, which is so rough that it rubs the flesh off your bones. The Bhotias shoot him with a bell-mouthed blunderbuss of large bore, which has a rest attached to it. They are good marksmen, and will hit a target with it, at a distance that you cannot distinguish between a white horse and a black.”

Talking of the cold in Thibet the other evening, he told me that it was so intense and increased so suddenly in some of the high passes of that country that persons had been frozen stiff while in the act of climbing up a mountain, and remained standing with the chin resting on a stick, until the sun of next day had thawed them, and the bodies tumbled down. Out of Lassa, Digarchi, or Giangtchi, and a few other towns, it is, he says, a wretched country to live in. “The land produces nothing but wheat, the wind is so sharp that it cracks the skin of your face, and as for wood to burn, or build with, there is not a bit anywhere. At Digarchi a stick the size of this tent-pole, 6 feet by 3 inches, would readily fetch 3 Rupees. Sheep they have however, in great abundance, and the wool is of beautiful quality; but for all that neither the Thibetans or the Chinese can make anything with it equal to English broadcloth. “What did that coat on you cost in Calcutta? there is nothing like your Bunat anywhere,” and thus he went on replying to my questions. All Thibetans have the greatest admiration for our broad cloths, and for purple, brown and dark yellow colours will give high prices. “Is there any opium smoking at Lassa?” I asked at one of our meetings. “There is some, and they are mad to



get it, but the Chinese have put many persons there to death for using it. Nevertheless it is to be had; and I have known as much as 30 Rupees paid for one pipe of it." "Is there any sent from Nipal?" "Yes, a good deal, but it is at a tremendous risk to the smugglers." I put this question, as I knew that our opium agents in Sarun and Tirhoot used some years ago, and do so now probably, to make opium advances in the Nipal tarai, which yields superb poppy. If the Goorkhas took to smuggling into Thibet as our traders do along the coasts of the Flowery Land, we might have successful rivals for the Sycee,\* but they have not a taste for this sort of dangerous traffic, nor for outraging the laws of China on its own soil.

21st.—I had purposed leaving this to-day on my return to Darjeeling, but I wait for Hooker. He will like to see these Sikimites at head-quarters, and will have no other chance of doing so. The people still continue to flock in from the westward to make their obeisances to the Raja and present their little offerings. These consist entirely of articles of food—in pork, kids, rice, fowls, eggs, milk, Murwa for beer, butter, spirits, plantains. At their departure they are honoured with presents of salt, tea, and blankets; all Thibetan articles are highly valued in Sikim.

I came this evening in my walk on an invalid taking the warm bath, which is such a favorite remedy in Sikim, (the Sachoo,) and before saying more about it, I wish to guard other travellers against mistaking these baths, when the Lepchas describe them for warm springs which have the same denomination.† It was close to this on the river-side. The bath is hollowed out of a rough log, and is 7 feet long, about 3 deep, and 2 wide. The water is warmed by throwing in hot stones until it is of the desired temperature. The patient was in the bath when I came up to it; at the foot of the tub was a large log fire, in which were a number of stones about 4 lbs. weight each; hot and ready for use. An attendant kept the fire going, and every now and then as the water cooled, and at the patient's bidding, he put in a stone extracted from the fire with a pair of bamboo tongs. I felt the water and thought it rather hot, so I sent for the Thermometer. It was 110° of Farenheat, and just then a stone was put in which raised it to 114°, and this was the point the patient kept it at while I staid. He

\* Ingots of China silver.

† Sa, hot—choo, water.



was quite red in the face and was sweating profusely. Now and then he washed his face with cold water, and took a mouthful to rinse and swallow. When rather exhausted he came out, sat on the tub side naked for some minutes and went in again. He had been at it in this way for some hours, and said he would repeat the process for the same time for two or three days. He was in the open air, which was however very mild. The Ther. stood at 60°. His complaint was pain in the chest.

We had very heavy rain again last night. It has rained here less or more nightly for a week. The Thermometer was down to 49° at daylight, when it was clear; a heavy fog formed soon after which did not disperse till near 9 o'clock. The river rose about a couple of feet during the night. I reckon by the rattan which is stretched across for the ferry-raft.

27th.—Top of Mainomchoo. Elevation 10,500 feet—2 feet of snow on the ground. Ther. at noon in the shade 32°. Bright, clear and very pleasant. It rained almost all day of the 22nd, and was unpleasant enough, as I had no means of moving about. In the evening I had a note from Hooker saying he would be at Yangang, one march off, that night. He came in to Bangsong on the 23rd in fine health and spirits, well pleased with his trip, and still purposing to prolong it. He had reached the top of the Walloongchoong pass into Thibet, about 16,700 feet high, having travelled the last 8 miles of the distance with snow on both sides up to the shoulders. From Walloongchoong he descended along the Tambur river to the junction of the Yangma, and then ascending that feeder of the Tambur failed in reaching the top of the Kanglachema pass, which appeared to be considerably higher, for he reached 16,000 feet and still far from the top. The Kanglanamo had been closed for 3 months. In the Yangma valley he found distinct remains of ancient glacial formations in dry lake beds and terraces, with boulders deposited along their margins.

The trade with Thibet is carried on entirely by Bhotiahs, and is principally in salt from the lakes; yaks and sheep are alone employed in the carriage of it. At Walloongchoong, which is two journies from the pass, there is a salt interpôt whence the Nipalese of the lower regions supply themselves; a few planks was the only thing he saw taken to Thibet. The yaks breathe hard and laboriously in the snow,

but toil most enduringly. From the Yangma valley, not being able as originally intended to enter Sikim by the Kanglanamo pass, which had been snowed up since October, he crossed the Nango ridge, 16,000 feet, into the Kambachen valley, and thence crossed the Choongjerma range, 15,000 feet, into the Yalloong valley, whence over the Singalelah ridge he reached Lingchoon in Sikim.

From Lingchoon he joined me via Pemongchi, Dalling, and Yangang, having crossed the Great Rungeet above Rinchinpoong.\*

The meeting with Hooker has been a most gratifying one. It was quite delightful to listen to his frank and modest account of his laborious and tedious journey, in the course of which he had to encounter what to many men would be great privations. For 18 days he had to subsist on 8 days' provisions, and was at last reduced to coarse boiled rice, and Chili vinegar! His discoveries in glacial Geology are altogether new in this part of the Himalaya, and although the lateness of the season deprived him of many of the plants of the higher regions, he has still made large collections. He has 18 species of *Rhododendron* for instance, many of them hitherto unknown.

On the 24th we had an interview with the Raja, at which I took my leave, and Hooker made his first and last appearance. It was on the whole satisfactory for my affairs, and I greatly rejoice at having made this trip to the Raja, in the course of which I have largely added to my knowledge of himself and his people, and consequently to my power of improving our own position with them, and adding to their knowledge of me and my Government. On the latter, and on the real nature of our power in India, and England, they are wofully ignorant, and not a little misinformed. I had, and took some good opportunities of talking with effect on this latter subject to the Dewan.

On the 25th started from Bangsong and returned by my outward route via Lingmoo and Neh, to Brom, whence, instead of keeping along the bottom of the Rungoom basin, we ascended via Sok to upper Namfok, near the residence of the Lasso Kaji, and a well peopled place, with neatly fenced fields of wheat and barley, and some patches of mustard and radishes. The profile of Mainomchoo from this is very wild and bold. Perpendicular cliffs of rock dipping to the north-

\* I am answerable for any inaccuracies that occur in this outline of Hooker's journey.

east, and sharp peaks rising in different places along it. Hooker has made a striking sketch of it. Thermometer at 6 P. M.  $46^{\circ}$ ; 10 P. M.  $43^{\circ}$ ; fell during the night to  $36^{\circ}$ .

On the 26th started for Mainomchoo, about 500 feet above last ground, and two miles distant, in a westerly direction, came to Yangang, where there is a Goomba, and just below it, in a very pretty spot, a small piece of water 400 yards in circumference, and said to be 15 feet deep. Put up a Woodcock here. From Yangang commenced the ascent of Mainomchoo. For the first hour we rode our ponies over a good road, and easy ascent, at the end of the second hour we came to oaks, chesnuts, Rhododendrons, and the paper plant. At the 3rd hour came upon patches of snow in shady places, birches and pretty purple primrose just coming into flower. Road steep, and overgrown with jungle. After 5 hours slow ascent we were obliged to halt for the coolies, and encamped 500 feet from the top, in a foot and a half of snow. Elevation 10,000 feet. Ther. at 6 P. M.  $34^{\circ}$ ; fell during the night to  $24^{\circ}$ . Surface of the snow  $36^{\circ}$ .\* It was wretched work for our bare-footed servants and coolies, who had to clear the ground of the snow for places to cook and lie down on, and cold enough for any one even with better appliances than theirs. One of the men went tumbling down the hill with his load, and we have lost all our stock of wine, brandy, butter, and almost all our sugar. The snow water, which is all we had, makes very good tea; but beware of getting it smoked in the melting.

Started at 7 this morning, and in an hour reached the summit of the hill. Snow two feet thick, and just hard enough to bear our weight.† A bright and clear morning—ascent very steep, and no road; cut our way through an under jungle of small bamboos, with a forest of pines, pinus, Webbiana, birches, and Rhododendrons. There is a small Goomba of two rooms, which occupies all the cleared portion of the summit, and in this we have taken up our quarters, for the Lamas do not come at this inclement season. In the outer room is our kitchen, we occupying the inner one. It is open at both ends of the roof, and has a very poor

\* All the Thermometrical observations since the 23rd were kindly given to me by Dr. Hooker.

† We came upon a covey of the beautiful Chilmia; their scarlet legs and bright plumage enabling us to see them a long way as they ran over the snow.



covering of 4 feet long thick shingles of pine loosely laid on rafters. We burn fires of pine and *Rhododendron* in both apartments, and barring the smoke, which is abominable we are snug enough. Hooker likes fires, and is indifferent to smoke. I do not like one or the other in the jungles, and prefer cloaking up to the cold. Here there is a full view of all the snowy mountains in Sikim, and of nearly the whole lower hills besides. It is a rare peak for the Geographer and admirer of mountain scenery. But Kunchinjinga is by no means so fine as from Darjeeling, the full view of it is cut off by the peaks of Nursing to the right, and Pundeem on the left. The great Rungeet, which rises from a spur of Kunchin bearing N. by W. from this, sweeps by a westerly and southerly course to Tassiding, which is a very remarkable place (and the connection of Mainomchoo with Kunchinjinga on the N. W. is by a saddle to the N. of Gongong.) It (Tassiding) bears from this S.  $78^{\circ}$  W. and is a nearly insulated eminence, round the N. east and south sides of which the great Rungeet flows, the Ratong flowing by its N. and W. sides. Tassiding is the most sacred spot in Sikim I believe, and besides the goomba has many tombs of famous Lamas. It is compared to the hill of Sumboonath in the valley of Nipal, on which there is a beautiful Buddhist temple. The two hills are somewhat similar in form; but there is no building in Sikim to be compared to that at Sumboonath for size or beauty.\* On the ascent to Mainomchoo I had a peep at Tumloong, the residence of the Raja. It was but for a minute, while clouds broke over it: and I did not get a bearing. It appeared to be on a spur from Chola: the Ryote river running to the east, the Runnett to the west of the spur. From the position of "La Ghep" of the Chola route, which I got from Mainomchoo, I think that Tumloong bears about  $70^{\circ}$  east from Mainomchoo.

28th.—Yangang, about 5000 feet above the level of the sea. Returned here to-day from Mainomchoo. The descent, which is upwards of 5000 feet, took us above 4 hours. It was a beautiful morning on the top of the hill, clear sky, bright sunshine, and hard frost. The thermometer fell during the night to  $21^{\circ}$ , and at 10 A. M. on the surface of the snow was  $25^{\circ}$ . On our arrival here the Lamas of the Goomba

\* I feel that the correctness of this remark is doubtful, since I have carefully examined the Goombas at Pomiongchi; I give the palm for beauty to Sumboonath nevertheless.



paid us a visit, bringing rice, eggs, butter, milk, &c. &c. They apologised for not bringing kids, or oxen, lest they should be accessory to the destruction of life, which is against the tenets of their religion.\* They suggested that we should assist with some contribution towards roofing the new Goomba with copper instead of bamboos. The party consisted of a principal, and 6 or 8 companions, all fat, placid, and well-bred men. "Now, that you have seen Sikim, what do you think of the country?" said the spokesman. "It is just the sort of wild country we like to travel in, and the people are very pleasing and hospitable," was the reply, and this is the truth. Kindness to strangers' frankness, and hospitality eminently distinguish *the people*. The outer walls of the monastery are built of stone with a white mud mortar, decomposed mica slate, the inner ones of mud mixed with sand and pebbles of clay slate, which is beaten and stamped into wooden frames six feet long, and 3 feet wide, and tiers of this are laid one over the other. It is similar to the Pisi work of Italy, and answers very well for walls not exposed to wet. Thermometer at 9 P. M. 45°. Water boils on Mainomchoo top at 192½°.

29th, *Lingdam*.—We visited the Goomba at Yangang this morning before starting, and found the Lamas at their morning religious exercises. They were civil and polite as usual. It was term-day with their tenants, who were collected round the Goomba; some to pay their house, or family tax, which takes the place of land-rent in Sikim, and some to make offerings of rice, murwa for beer, beef, &c. The library we saw did not exceed 20 volumes; and there were about a dozen images of gilded brass and painted clays, ranged in a bookshelf like a cabinet, one image in each compartment. In the centre was the image of Sakya, called Sakya-thoba, in Sikim; the names of the others were altogether unpronounceable.

After Hooker had taken a circle of bearings we started for this place at 10 A. M. and reached it at ½ past 3 P. M. having stopped an hour at the top of the Raklang ridge. Taking this march altogether it is an exceedingly interesting one, and the scenery from this side of Raklang is very fine indeed. Our route from Yangang lay N. W. along the west face of Mainomchoo, descending gradually into the bed of the Rungpo, which we crossed; and thence ascended

\* They do not eat the less beef on this account.

rather steeply to the saddle of Raklang, which is the connecting point of the Tendong division of Sikim with the mountain of Mainomchoo. This saddle is about 7000 feet high, and two roads diverge at the point we made it; one to Raklang Goomba, one march in a northerly direction, and the other to the west to Pomingchi, and the old Sikim Durbar viâ Lingdam, Kazing and Tassiding. In fact we have come to-day along the high road from the N. W. districts, and from the old to the present seat of Government. A very fair road it is too. The last mile up to the saddle of Raklang runs through a fine forest; and this fine avenue continues on this side for more than a mile, when suddenly emerging from the forest, Tassiding and Pomiongchi on the opposite side of the Rungeet, burst upon you right in front and to the west. Tassiding is from all points of view a very remarkable and striking feature, and it shall be more particularly described anon. To the N. W. is Sunoong, a small Goomba, and beyond it in the same direction is Powhunny, a flat-topped mountain, probably 8000 feet high, greatly resembling Tendong, with a decaying Goomba on its summit. Further west is the Kechoppery Goomba, on the north of which is said to be a lake of the same name. From Lingdam 11 Goombas are visible; they are named, and bear by compass as follows: Mainomchoo N. 50 E.; Raklang N. 30 W.; Sunoong 45 W.; Kechoppery 73 W.; Malli 77 W.; Tassiding 77 W.; Pomiongchi W.; of Dalling Powhunny, Mangberoo, and Changachiling I did not get bearings.

There is a high cliff on the west face of Mainomchoo, which has a large patch of greenish blue on it. The people believe it is of turquoise, for it is quite inaccessible. Hooker informs me that it is a Lichen. After crossing the Rungpo we came upon a large rock 30 feet by 13, with "Om, Mane, Pemi, Om,"\* carved on it in gigantic letters 3 feet long, and in numerous places the same invocation in smaller letters. At the upper left hand corner of the rock there is a large inscription in the Thibetan character, which is supposed to record the time at which the large letters were engraved, and something concerning the person who engraved them. He was the head Lama of the neighbouring Goomba at Raklang. This however is not authentic. It is usual and proper for travellers to walk along the face of the rock

\* See a most interesting notice of this popular prayer by M. Huc, p. 238 of No. 49 of the Annals of the Propagation of the Faith.

on a 2-inch ledge which runs over the top of the large letters. This may be done easily enough by bare-footed persons holding on with the hand; but that has no merit, and it is only he who walks 3 times along it without holding on, who does a righteous and holy act.

There is a filled up lake here, (Singdam,) about 100 yards across, with a clear stream running out of its bed, which crosses the road and precipitates itself over a rock, about 40 feet high, and close to the road. Thermometer fell during the night to 39°. Probable elevation 5,500 feet; some neat houses close to our encampment, surrounded by fields of wheat and barley, and well fenced. The inhabitants in this neighbourhood are principally Bhotiahs, and they are generally well housed, comfortable, and good-looking.

Suneek, a village on the ridge N. of Tassiding.

30th.—We had hoped for a bright morning, and a grand view of Kunchinjinga from Lingdam, but awoke to a cloudy day and limited prospect. This is comparatively speaking, for with Mainomchoo, the singular Tassiding, Sunoong, Raklang, Dalling, and Pomiongchi, together with the swelling and level spurs of Lingdam itself, we had a scene of much beauty and interest. Soon after starting we passed through Bamfoong, and two miles further on in a westerly direction came to Kayzing, all the way by a nearly level and wide road. A buggy drive of 3 miles might be constructed along the Lingdam Leang at little cost, and used with perfect safety, so swelling and nearly level is it throughout a great part of this extent. It is the finest situation by far I have seen in Sikim for farming and grazing purposes. The plough might be used most easily, and there are numerous sites for commodious farmsteads above and below the road. In such a locality the industry and perseverance of colonists, like our excellent German ones at Darjeeling, would be turned to full account.

From Kayzing, we descended steeply to the Great Rungeet, crossing the Runeok, a feeder of it from Lingdam. There is a bamboo suspension bridge over the Rungeet below Tassiding, of simple and singular construction. Three large bamboos, the ends of which are held down by stones on either bank, form the arched parapets by their smaller ends being pulled down and lashed together. From these parapets are ratan suspenders, on which the roadway also, of 3 bamboos, lies, cross uprights fixed in the ground support the ends of the roadway.



The river is about 80 feet across here. The ascent to Tassiding is very steep indeed ; it took an hour and a half. The summit is 2500 feet above the river, and is entirely occupied by temples, chaityas, men-dongs, and the dwelling houses of the Lamas ; a very remarkable place indeed. The hill, which is rounded to the south, rises abruptly from the Rungeet and Rotong rivers, which flow along 3 sides of it, and unite their waters at its southern extremity ; it is well wooded to the top. Darjeeling bears due south, Sinchul S. by W. ; our road lay through all its buildings, whence we descended a short way to Suneek, as there is no water nearer.

. 31st, *Suneek*.—We halted here to-day, and went up to Tassiding to examine it more carefully. The buildings consist of 3 Goombas, two large and a centre smaller one, which is painted red on the outside, with a border along the top of the walls of white skulls with black teeth. This is the Goomba now used for every day worship, but it was originally dedicated to the devil, and other deities of evil omen. All the Goombas are built of stone, with very little mortar of whitish clay. The masonry is admirable, and although the buildings at Pomiongchi of the same sort are said to be from 3 to 400 years old, they are in perfect preservation. The northern and largest Goomba is a handsome edifice, about 80 feet long, 40 broad, and 35 feet high. It tapers from the foundation to the summit, and has a pitch-roof of bamboo thatch rounded at the ends, and projecting about 10 feet beyond the top of the wall, so as fully to protect the base. The only entrance to the lower story of the temple is at the eastern end, it is 3 stories high, and in each story are narrow windows of lattice-work. The body of the lower story is divided into a vestibule, which runs the whole breadth of the building, and into the temple proper, which is 42 feet long by 33 feet wide. It is equally divided into a centre aisle and two sides, by three pillars on each side. The pillars are of wood, very handsomely painted in vermilion and gold, and support 3 massive architraves, which extend across the building and are beautifully painted in squares and diamonds of bright vermilion and gold, with dragons in white, vermilion and gold. Over each pillar is a gilded Lion with black terminal tail-brush. The effect of the painting, as it is in very brilliant colours, is extremely good. The centre aisle has a low bench on each side covered with yellow and purple felts, for the seats of the Lamas only, on great occasions



of public worship. At the head of each bench is a raised square ottoman covered with leopard skin, for two of the higher Lamas, or for the officiating ones, as may be. These benches were the only things in the Goomba which the Lamas were particular about not being touched by our followers.

The western end of the temple is occupied by a range of 11 large images. The principal one, about twice the natural size of a man, occupies the centre. It is named "Chomden Day,"\* which means "God;" it is in the sitting posture, cross-legged, with the right hand resting on the right knee. In the left is a black bowl, said to be for food. On the right and left of the great image is a tonsured Lama, or Chela, standing each with a black bowl in hand, and said to contain food for the deity. The right hand one is named kungan, the left mangah. These images are flanked on either side by 4 handsome images holding flowers in their hands, and said to be attendant satellites from India; "Gyagur" is the Thibetan for India, "Gynak" for China. All these 11 images are gilded and 10 are standing erect. In the wall behind them, the sun and moon are painted, the former on the right of the centre image, the latter on the left.

The whole of the inner walls from the ceiling to 2 feet from the ground are painted with figures. On the right of the entrance door are 3 very good figures. The centre one represents the 3rd Raja of Sikim, who was also the Pontiff of his own kingdom, and who bestowed his daughter in marriage on a Lama of Sunoon Goomba, the monks of which were privileged to marry, and whose descendants are still at Dobtah in Thibet enjoying the same immunity from celibacy.

On the left of the Raja is his daughter—a young and captivating damsel, in a broad-brimmed Chinese hat; on his right is the reverend Lama the favored spouse of the lady. The "Lama Raja," which is equivalent in Sikim to "Sovereign Pontiff," and his fair daughter are very excellent paintings.

On the south wall to the right of the images is a large red painting of an 8-handed Shiva trampling with the right foot on two white human beings; with the left on one black, and one yellow human figure. This large Shiva is surrounded by 8 smaller ones, and beyond these are innumerable Lamas sitting cross-legged, some dressed in red

\* Chomden Das is Sakya Singha.—*De Coros.*

and yellow robes with conical red caps, and some with bare tonsured heads, some sitting in contemplation, others apparently expounding.

On the left of the images, north wall, is another large, many-handed figure with a conical head-dress, which is thickly studded with eyes and human skulls. With the right foot it is trampling down an elephant and lion. With the left, an elephant, a human being, and a snake. This image has 10 pair of arms in all, one red and nine blue. On either side are 4 smaller 12-handed figures of the same image painted blue and trampling on human beings. One of them trampling on a buffalo. Around are numerous Lamas in silent contemplation, or with hands upraised, expounding. In the whole of this temple there is not one lewd or indecent figure. Not one hooded snake of Vishnoo. Not one Trident of Mahadev. Not one figure of Krishna, nor any figure with the brahminical string. Between the above group and the "Lama Raja's" group is a large figure of Vishnoo in the sitting posture, surrounded by leaves, flowers, and unexpanded buds of the Lotus, which is named "Pe-dong" in Thibetan. The flowers are of 3 sorts—white, pink, and red. This deity is named "Lobe Pema Toongni," which being translated is, "self-produced of the Lotus." At his right foot is a female deity of Gyagur\* or India, coloured white with bead necklaces. At the left foot is a female deity of Thibet, named "Kando Ishe Sage," also white with bead necklaces, all around, as in the other groups, are innumerable figures of Lamas. So much for No. 1, or the northern Goomba.

No. 2, or the southern one, displays a different style of images. Facing the doorway† and at the termination of the aisle is a recess, about 10 feet deep, containing the principal images, which are 5 in number. In the centre of the recess, and raised above the others, is "Lobe Runboochi," in a sitting posture, holding the "Dorge" in his right hand; which rests on the right knee; in his left, a cup for holy water to be sprinkled on the congregated worshippers. Supported by the left arm is the Trident of Mahadeo, on the shaft of which are pierced human heads and skulls, with 3 dorges. In front of the head-dress is

\* Gya-nak, China—Gya-gar, Indian Gya var Russian.—*Klaproth*.

† All the Goombas have the great entrance to the east, and their length is east and west.

a Lunar crescent surmounted by the sun. At his feet is a plume of Lotus flowers and buds. Large ear-rings hang from the pierced lobes and a robe of blue and gold closing over the right breast, with an under garment of red and gold, complete the costume and the symbols of this compound deity.\*

On the right is a female image, "Kando Ishe Sage," holding a cup of water in the left hand, while she sprinkles the great image from it with the right. Further on the right is the image of a Lama named Lapchen Chimboo. He is in the sitting posture—his legs crossed. In his right hand he holds a human thigh-bone used for calling to prayers, in the left a cup for food. The left arm supports a trident with human hands, skulls, and dorge on the shaft, and the head-dress is ornamented with a wreath of human skulls. This image is painted pale blue and has necklaces of beads.

On the left of the great image are two Lamas, one of them is offering him the "Nurbo," the other a human skull. The Nurbo is an arrow-shaped piece of gold with 3 jewels set in it; at least it appeared so to me. It is said to be the offering of highest price, and to emit a spontaneous light at night.

This was all I could make of what the Lamas knew of the "Nurbo."

In the vestibule are two large devilish figures painted on the walls on either side of the doorway. One is black with white teeth, and claws and horrid goggle eyes. The other is yellow, and of similar stamp. They represent deities, who destroy ghosts and other demons. This Goomba, No. 2, contains the Library, which at present has only 82 volumes.

These were very neatly ranged in two cabinets, which occupied recesses in the centre of each side of the body of the temple. For each volume there was a separate compartment, and in the centre of each

\* The trident and skulls being Shivaite symbols, the dorge and cup Lamaical. The whole of the symbols belong to Nāthism, as recognised by the northern Buddhists. The dorge is the Viswavagra, or double thunderbolt, and the deity described is Goroksha-nath, from whom the Gorkha nation and the district of Gorakhpur derive their names. He is the great Yogeshwar or Natheshwar of these regions. His followers are called Yogis or Jogis on this side the snows; Ningmapa on the other side.—*B. H. Hodgson.*

cabinet the image of a Lama sits enshrined. These images are gilded, and hold a blue bowl, called Soongjup, in the right hand. The cabinets are handsomely painted in gold, vermilion, and blue, and had a very good effect. The volumes were of the usual kind, 2 feet long 9 inches broad, and 9 inches thick, composed of loose leaves rolled up in cloth, and two carved wooden boards strapped over them for binding.

Next to the Goombas, the "Place of Tombs" is the most interesting object at Tassiding.

It lies at the south end of the terrace, and contains 26 Chaityas or funeral monuments, of various sizes, all built of stone, with a little clay mortar, and in excellent order. The centre of the group of tombs is occupied by the largest of them, which is a fine looking, and well proportioned monument. The basement is 27 feet square, and rises by 4 steps. From the top of this platform springs the shaft, which is about 4 feet high, and is surmounted by a cornice projecting 4 feet; over this is a second shaft which tapers by 5 steps, and resting on this is what may be called the bowl of the Chaitya. It is in some instances a hemisphere, but much more frequently is a truncated oval. From out of the bowl rises the Pinnacle, which is 4-sided, and tapers to a point, or is occasionally surmounted by a wooden apex representing a Lunar crescent with the sun's orb in the centre. The height of this Chaitya, which has a basement of 27 feet square, may be 25 feet. Near it is the monument of the heir apparent of Sikim, who died in 1841, and was not a Lama. At Pomiongchi, the Chaitya built to the memory of a great ally of mine, the Badong Kaji, was pointed out to me. It was in all respects the same as others built in honor of holy Lamas, and I believe that these monuments to the laity share the veneration that is accorded to those of the priesthood. Chaityas and Mendongs in Sikim, on the road and elsewhere, are always passed on the right hand.

On the north side of Tassiding, and close to the summit, there are some rocky crevices which emit heated air; at 5 P. M., the external air was at 51° of Faht., in one of these crevices it was 64°.

*January 1st, 1849.—Pomiongchi Goomba.*—We left Suneek at 8 A. M., after an hour's steep descent in a N. W. direction we reached the Ratong river, which we crossed by a very rickety bamboo bridge, like the one over the Rungeet below Tassiding. Both banks of the Ratong



very precipitous ; breadth of the stream 50 feet. At the top of the first ascent is Kamett, a small hamlet of Lepchas ; further up is "Tashong," where the road to Darjeeling by Rinchinpoong goes off to the left, and next is Sakiong, the site of a decayed Goomba. Here there was a good deal of wheat and barley cultivation well fenced in. From Sakiong the ascent is steep, and through a fine forest all the way to Pomiongchi. From the Ratong it took us  $2\frac{1}{2}$  hours good marching. \* \* \* I never go fast up hill when marching. This I have adopted from the coolies, who never quicken their pace to the sweating point, unless very much urged, and then they knock up.

Elevation of Pomiongchi 7000 feet.\* The Goomba commands a superb prospect of the snowy range, and almost of the whole of Sikim. It is beautifully built of stone, is 3 stories high, about 30 feet, is 80 feet long by 40, and has stood for 8 reigns of the Sikim dynasty, which the Lamas reckon at 400 years, i. e. an average of 50 years per reign, which is doubtless too much. The present Raja however has reigned 64 years. He came to the throne at 6 years old. His father, who fled at the Goorkha invasion, and died in Thibet, reigned 33 years. The particulars of other reigns are not known.

When the Goorkhas invaded Sikim the Sikimites assembled to oppose them at Nagri, (the Nagarcote of our treaty of 1816 with Nipal,) but while a portion of the force kept the Sikimites in occupation at Nagri, the main body turned their flank to the north, and came over Islimbo into the valley of the Kullait ; so rapid and sudden was the incursion that the Lamas at Pomiongchi had not time to remove their books or other monastery property, but fled to the Ratong, where they died of cold and hunger.

The library, which had 400 volumes of Thibetan works in gold letter press on black ground, was burned, and a similar fate fell upon the books, &c. at Rabdenchi, the old Durbar, which is close by Darjeeling, bears S. 4 E. from Pomiongchi, and is distant about 30 miles.

The following are the principal figures and images in the Goomba :—  
In the vestibule—

1 *Tangla*.—A Thibetan deity mounted on a white horse.

\* The elevations noted in this journal are from Colonel Waugh and Dr. Hooker. They are respectively Trigonometrical and Barometrical results.

2 *Looi Poomoo*.—A female deity (mermaid like,) all under the navel is a snake, the head is crowned with snakes. She is the daughter of Nagarjun, the great snake king or snake God of the Hindus—a form of Shiva.\*

3 *Dorle*.—A Thibetan deity. He is mounted on a sphinx, or it may be a lion.

The body of the temple is a good deal like the Tassiding ones already noted. Three pillars on each side, very handsomely gilded and painted, form the aisle. Felt seats raised a foot from the ground run between the pillars; they are exclusively for the Lamas.

The side walls are painted in numerous groups and figures, from the ceiling to within 3 feet of the floor. The images are in a deep recess at the west end of the aisle, and nearly as large as life. They are as follows:—

1 *Sakya Thoba*.—The great Apostle or Avatar of Buddhism. He occupies the centre of the recess and of the group.

2. A tonsured Lama on the right of Sakya, standing with the pastoral staff in hand.

3. Ditto ditto on the left of Sakya.

4. A red-faced male image with a 4-armed female one clasped round him,—left of Sakya.

5. A red-faced image of Shiva,† with ornaments of human skulls, and a woman clasped round him in indecent attitude. Left of Sakya.

6. A white-faced male image with a trident over the left shoulder, human skulls, heads, and the Dorje on shaft of trident; right of Sakya.

7. A blood-red image of Devi, the goddess of destruction, war and pestilence; right of Sakya.

8. A red male deity sitting cross-legged with the hands folded over the knees. •

9. A white image with the Dorje in hand.

\* Nagarjun is one of the beatified sages of Buddhism, to whom Mount N. Ajon in Nipal is dedicated. The snake king is Kakotâk, a Buddhist deity, also after whom Nipal is called Nâgbâs.—*B. H. H.*

† These are images of Tantrica Buddhism, *not* of brâhmanism, as commonly supposed.—*B. H. H.*

10. An image of the first Raja of Sikim, who was deified. It is treated as that of a deity.

The walls are principally occupied with paintings of Lamas, white and yellow skinned, sitting in deep thought or expounding, the right arm being raised. There are also, among others, the following marked figures :—

1. A Shiva, I suppose.\* Face and body red, the shoulders and body partially clothed with skins of human beings, tigers and snakes. It has but one foot, which is placed on the back of a gigantic human being, who is crawling with his load, the features of his face painfully distorted.

2. *Another*.—Face and body blue. Bow and arrow in hand, neck and head ornamented with human skulls.

3. *Namgemoo*.—An 8-handed 4-faced figure. The face colours are white, red, blue, and yellow—a face of each.

4. A full length painting with a Lama's mitre-crowned cap ; the Dorje in the right hand, and the trident in the left. This, as well as many of the images and figures already noted, unite the Shivaite symbols of Hindooism with those of Lamaism, and this union is I think the true representation of Buddhism at Pomiongchi.

The conversion of the Lepchas to Lamaism was not rapid. It took 3 reigns before it was general ; it is by no means universal yet. The indigenous Bhotias of Sikim, Arhats, held back from the new religion less than the Lepchas. The Magars and Limboos, were and are the most recusant of all. When they quit their own religion, (if sacrificing fowls and pigs to propitiate evil spirits can be called religion,) they adopt a sort of Hindooism. The Lamas of Sikim are however the most tolerant of priests, and not to follow them in the faith does not bring persecution or mischief to any man's door. We had hard frost at Pomiongchi on the morning of the 2nd ; at 7 A. M. the ther. in the air stood at 32°. On the ground at 25°. Here I was to leave Hooker after 10 happy days spent together. He had to start for Jongri next day ; I did so for Darjeeling, and marched to Tadong. He accompanied me as far as the Gayzing Mendong, which is about 2000 feet below Pomiongchi, and to the south of it. It is the most extensive of all the Mendongs in Sikim ; it is 200 yards long, about 10

\* See second note, p. 537.

feet high, and as many broad. At the north end is a Chaitya, and at the south end an upright stone 9 feet high, fixed in a basement of dry stone masonry. At 4 feet from the ground, and along both sides, is a line of inscribed and figured slabs, 708 in all. The figures are principally Buddhas in the usual sitting posture—the others are Hindu deities. The inscriptions are in the “Oochen” and “Lencha” characters of Thibet. Uchen and Ranja\* of some pronunciations. The slabs are generally from a foot to 2 feet square. This 9 feet upright stone has writing all over its southern side.

From Gayzing I reached the Kullait river. After an hour of steep descent forded the river; it was 40 feet wide, thence ascended by a horrid road, which is very little used, to Tadong, “which is to the west of and above Rinchinpoong; crossed the Rungsong, a feeder of the Kullait near Tadong. Ther. at 7 A. M. 40°.

*January 3rd.*—Started at 7 A. M.; about a mile above Tadong well, fell into the high road from Rinchinpoong, at a saddle in the Kaluk ridge, where there is a Mendong. From this point the “Zhen lah,” a ridge with 3 remarkable conical peaks, comes in view to the south. The centre peak of the 3 bears S. 20 W. The Kaluk and Zhen lah ridges are separated by the Rishi, which runs easterly to the great Rungeet. On the eastern continuation of the Zhen lah is the Lenchi Goomba. It bears S. 15 E. An hour and half from Taluk Mendong we crossed the Rishi by sticks laid from one boulder to another, through a very rapid current, into which one of the coolies fell. From this we ascended to a saddle between two of the Zhen lah peaks; crossed the ridge at the elevation of 3500 feet, I reckon, and at a Mendong. Thence we descended to the Rahto, a feeder of the great Rungeet, and running easterly, and by a tedious ascent in a south direction, we reached a saddle on the ridge of Chakoong, which saddle is 5000 feet, I think, and 6 hours good marching from Tadong. There is a Mendong at the saddle, and some Lepchas’ houses, but water is distant, so we crossed Chakoong and descended about a mile on its southern face to a small stream of water. From Chakoong the head of the little Rungeet bears S. 52 W., and Talom, a very large flat terrace, S. 70 W.

There is iron ore in the Chakoong range, and a mine was at one time worked there, but is now closed, as the Lamas pronounce it an

\* Ranja, Sanscrit—and Outza, Tibetan.—B. H. H.



unhallowed work to dig into the bowels of the earth! The large lime deposit which I visited six years ago, is also in the Chakoong range.

Found tree ferns on the Rishi—the first I have seen since I crossed the Rungeet on the way out.

*January 4th.*—Descended in a S. West direction to the Rumam river, which we crossed to the Kirmi range over bundles of bamboos laid from rock to rock over a furious current. A little lower down there is a suspension bridge for the rains. From the Rumam, the road runs by the river on the Kirmi side for about 2 miles, and is nearly level; then it ascends to the Goke spur, crosses it at a Mendong, and descends to the little Rungeet opposite the Police Chowkey, which is in our territory, and about 10 miles from Darjeeling via the Vah spur, and Tugvor. I arrived at Darjeeling very tired, and just one month from the day I started.

## METEOROLOGY.

Sikkim, Dec. 1848.

Date.	Hour.	Place.	Shade.	Sun.	W.B	Wind, &c. &c.
Dec. 4.	5 P. M.	Rungeet Guard house.	68°	..	..	Calm S. clear.
*	6 .. ..	.. ..	68	..	..	Ditto Ditto.
	8 .. ..	.. ..	64	..	..	Ditto Ditto.
	9 .. ..	.. ..	64	..	..	Cloudy.
* 5	6 A. M.	.. ..	58	..	..	Clear. No dew.
	7 .. ..	.. ..	59	..	..	Ditto and Calm.
	8 .. ..	Cane bridge.	64	..	..	Temp: of river 59°.
	4 P. M.	Selukfoke.	59	..	53	Heavy frost; calm.
	5 .. ..	.. ..	54	..	50	Slight air North.
	7 .. ..	.. ..	54	..	..	Ditto.
	9 .. ..	.. ..	53	..	..	Calm.
* 6	6 A. M.	.. ..	51	..	..	Light breeze.
	10.. ..	Peak of Silukfoke.		70°	..	.. ..
	11.. ..	Namgialachi.	69	100	62	.. ..
	12.. ..	.. ..	70	..	64	.. ..
	5 P. M.	.. ..	56	..	..	.. ..
	2 .. ..	.. ..	63	..	..	.. ..
	6 .. ..	.. ..	52	..	..	Moon light; cloudy.
	7 .. ..	.. ..	52	..	..	Water boils 201½.
* 7	4 A. M.	.. ..	44	..	..	Very heavy dew.
	5 .. ..	.. ..	45	..	..	.. ..
	8 .. ..	Sundoopechi.	50	..	..	Cloudy.
	10.. ..	Lamchook foot of				
		Tendong.	45	..	..	Ditto.
	11.. ..	Tendong top.	46	..	..	Ditto.
	4 P. M.	Tem.	50	..	..	Gentle breeze N. E.
	8 .. ..	.. ..	50	..	..	Water boils at 202.
	10.. ..	.. ..	50	..	..	Calm and clear.
† 8	5 A. M.	.. ..	50	..	..	Very heavy dew.
	11.. ..	Rungni River.	66	..	..	Temp: of stream 61°.
	4 P. M.	Namfok.	64	..	..	Water boils 208°.

\* In a small Blanket tent without shade.

† Without Black Bulb.

Date.	Hour.	Place.	Shade.	Sun.	W.B.	Wind, &c. &c.
Dec.	8 .. ..	.. ..	60	..	..	.. ..
9	3 P. M.	Teesta, Bangsong.	70	80	..	Water boils at 209°.
	5 .. ..	.. ..	62	..	..	Temp : of river 52°.
	8 .. ..	.. ..	59	..	..	Brilliant night.
10	7 A. M.	.. ..	57	..	..	Temp : of river 53°.
	3 P. M.	.. ..	70	..	6	Calm.
11	2 P. M.	Kedong.	58	..	..	Temp : of stream 54°.
	4 .. ..	.. ..	56	..	..	Calm.
	5 .. ..	.. ..	51	..	..	Water boils 200 $\frac{1}{2}$ .
	9 .. ..	.. ..	56	..	..	Cloudy and drops of rain.
12	6 A. M.	Kedong.	52	..	..	.. ..
	7 .. ..	.. ..	52	..	..	.. ..
	1 P. M.	Takbrum.	60	..	..	Temp : of streamlet 56°.
	6 .. ..	.. ..	57	..	..	Water boils 204°.
	9 .. ..	.. ..	54	..	..	Very cloudy overhead and to the N.
13	6 A. M.	.. ..	45	..	..	Snowed heavily on the mountains during the night. Bright and clear.
	11.. ..	Sungdam.	58	..	..	.. ..
	3 P. M.	Kedong.	59	..	..	Fine bright forenoon.
15	6 P. M.	Teesta, Bangsong.	60	..	..	Rain all day, now pouring heavily,
16	1 P. M.	.. ..	62	..	..	Temp : of river 52°. Rain ceased at day light.
						Ther : 60. Water boils 208 $\frac{3}{4}$ ths. Fell to 36° during the night.
25	6 P. M.	Upper Namfok.	45			
	10.. ..	.. ..	43			
27	10 P. M.	Mainomchoo shoulder	36	..	..	Fell during the night to 24°. Two feet of snow on the ground.
28	10 A. M.	Top of Mainomchoo.	38	132	..	Fell to 21° during the night ; very hard frost. Temp : of the snow 26°. Water boils at 192 $\frac{1}{2}$ .
	9 P. M.	Yangang.	45			
30	7 A. M.	Lingdam.	40			
	9 P. M.	Suncek..	51			

PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL  
FOR MAY, 1849.

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The usual monthly meeting of the Asiatic Society was held on Saturday, the 5th May, 1849.

The HON'BLE SIR JAMES COLVILLE, President, in the chair.

The proceedings of the April meeting were read and confirmed, and the accounts and vouchers of the preceding month laid upon the table.

Dr. Macrae, having been proposed at the April meeting, was ballotted for and duly elected.

The following gentlemen were proposed as members :—

Cecil Beadon, Esq., C. S. proposed by Mr. Piddington, seconded by Mr. Laidlay.

Dr. Row, Superintending Surgeon, Dacca, proposed by Lieut. Staples, seconded by Mr. Laidlay.

R. V. Thurnburn, Esq., proposed by Dr. McClelland, seconded by Dr. Walker.

Raja Radhakant Deb intimated his desire to withdraw his name from the list of members.

Read a letter from H. M. Elliot, Esq. Secretary to Government of India, with the Governor General, forwarding for publication Journal of a Trip through the Kohistan of the Jullunder, by Lieut. W. H. Parish. (Ordered for publication in the Journal.)

From A. Shakespear, Esq. Officiating Assistant Secretary to the Government N. W. P., transmitting Capt. Fenwick's Journal of his passage down the Nerbudda from Chikulda to Baroach. As also abstracts of two Journals containing a notice of the most important obstructions to the navigation.

From C. Allen, Esq. Officiating Secretary to Government N. W. P. forwarding a note by Lieut. R. Strachey of the Engineers, on the snow line in the Himalaya, for publication in the Journal, and requests to be furnished with 100 copies of the same.

From W. Seton Karr, Esq., Under-Secretary to Government of Bengal, conveying (in reply to the application of the Council) the orders of Government regarding the authority the Council of the Asiatic Society are to exercise over the Curator of the Museum of Economic Geology and his expenditure. The following reply has been received.

No. 545.

*From the Under-Secretary to the Government of Bengal,  
To J. W. LAIDLAY, Esq., Joint Secretary to the Asiatic Society.  
Dated Fort William, the 14th April, 1849.*

SIR,—Your letter to the address of the Secretary to the Government of India, in the Home Department, dated February last, having been transferred to this Office, I am directed by the Deputy Governor of Bengal to forward, in reply, a copy of a letter which was addressed to Mr. Piddington on the 21st November 1846, No. 761.

2. His Honor further directs me to beg that the contingent bills of the Museum of Economic Geology may be passed, as heretofore, by the Secretary, who, as being responsible under the Society's Council for the due application of the Government Grant, has the power to disallow any excessive or unreasonable charges contained in those bills. I am also directed to state that every consideration will always be given by the Government to the recommendation of the Council, either for the appointment or for the removal of the Curator.

3. The Society are requested to correspond direct with this Office for the future.

I have the honor to be, Sir,

Your most Obedient Servant,

W. SETON KARR,

*Under-Secretary to the Government of Bengal.*

No. 761.

*From G. A. BUSHBY, Esq., Secretary to the Government of India,  
Home Department,*

*To H. PIDDINGTON, Esq. Curator Museum Economic Geology.*

*Dated the 21st November, 1846.*

SIR,—I am directed to acknowledge the receipt of your letter dated the 6th instant, with enclosurc, and in reply to state that the Government would



not appoint to the Office of Curator to the Museum of Economic Geology but on the recommendation of the Asiatic Society, and the President in Council would not wish in any way to interfere authoritatively with the appointment in question.

I have, &c.

(Signed) G. A. BUSHBY,

*Secretary to the Government of India.*

(True Copy.)

W. SETON KARR,

*Under-Secretary to the Government of Bengal.*

From Professor Holinboe of the Christiania University, announcing the despatch of a collection of objects of Natural History.

From B. H. Hodgson, Esq., forwarding a description of the Polecat of Tibet.

From the same, forwarding a note of the Aborigines of Southern India.

From the same, forwarding a valuable MS. copy of *Lalita Vistara*, for publication in the *Bibliotheca Indica*.

Ordered, that the thanks of the Society be presented to Mr. Hodgson, and the subject referred to the Oriental Section.

From Dr. Hooker, Botanical notes made during an excursion in Sikim, presented by the Hon'ble the President.

From J. Christian, Esq., forwarding a Sanscrit inscription on a slab of stone from a temple near Monghir, and its translation.

From Baron Hammer Purgstall, presenting the Vienna Review and Transactions of the Imperial Academy of Sciences.

From Professor Flügel, acknowledging a copy of Abdool Razaq's Dictionary, and requesting to be nominated a member of the Asiatic Society.

From W. Neal, Esq. Collector of Oriental Translation Fund, London, acknowledging the Society's remittance of £ 21 in payment of subscription to the Oriental Translation Fund, for 1847-48.

From Prince Golam Muhamud, presenting donation of books to the Society.

From Captain Hollings, presenting a small collection of coins.

From F. Taylor, Esq. Officiating Secretary of the Local Committee of Public Instructions, Delhi, soliciting a copy of the Journal of the Society for the use of the Delhi College.

Ordered, that the Society regret that they cannot comply with Mr. Taylor's request, in consequence of having refused similar applications.

From Dr. Roer, Secretary to the Oriental Section, the following letter :—

*To J. W. LAIDLAY, Esq. Secretary Asiatic Society.*

*Dated Asiatic Society, the 28th March, 1849.*

SIR,—I have the honour to return to you my Report of the 6th ult. and to state for the information of the Council and the Society, that the Oriental Section have agreed to the proposals therein submitted, with the exception of the first, concerning the MSS. to be lent to Dr. Müller, which they beg to refer to the decision of a General Meeting of the Society.

2. With regard to the third proposal, it is the view of the Section, that Mr. Koenig's request should be complied with on the condition, that he pays for the copies. No opinion, however, has been offered on the Oriental works which I proposed for exchange, and which ought to be in our Library, and I therefore beg leave to recommend the purchase of them by the Society.

I have the honour to be, Sir,

Your most Obedient Servant,

E. ROER,

*Co-Secretary Asiatic Society, Oriental Department.*

*To DR. W. B. O'SHAUGHNESSY, Senior Secretary, Asiatic Society, Bengal.*

*Dated Asiatic Society, the 5th February, 1848.*

SIR,—I have the honour to submit to you, for the consideration of the Council and the Asiatic Society, a report on the following subjects :—

1. Dr. Müller, the editor of the *Sanhitá* of the *Rig Veda*, has repeatedly expressed to me his anxious desire to obtain some more MSS. for the second *Ashtaka* of the *Rig Veda*, if possible the MS. of a private Library, as those of public Libraries are almost all copies of the same original. I have not succeeded in procuring a MS. of this kind, but it occurs to me, that the Society is able to assist Dr. Muller in his undertaking by granting him the loan of the *Rig Veda Sanhitá* with commentary, in its Library, and also of the parts of the *Rig Veda* that have been copied at Benares for the Society. The MS. of the Society, unless compared with other MSS., is quite worthless, as it is *very incorrect and defective*. Yet it has been of great use to me, since it contains sometimes passages which are not met with in any other MS., and I therefore believe it would be a valuable assistance also to Dr. Müller. Although it is not usual to lend the MSS. of our Library to gentlemen not residing in Calcutta, I think the Society should make an exception on an occasion as the present; for beside, that every learned

Society should afford all assistance in its power to further an undertaking of this kind, Dr. Müller's publication is made under the auspices of the Court of Directors.

2. Dr. Weber from Berlin, has sent a specimen of his edition of the *Vajasaneyi Sanhitá*, or the *Sanhitá* of the White Yajur Veda, for the inspection of the Society. The first parts of the first and second volumes (each of 160 pages) will probably appear in March, at Co.'s Rs. 10. The whole work is to contain : 1. *Vajasaneya Sanhitá*, with the commentary of Mádhava. 2. *Sata Patha Bráhmāna*, with extracts from the commentaries of Mádhava, Parswami and Dwiveda Ganga. 3. *Katyáyana Sranta Sūtra*, with extracts from the commentaries of Yajnaka Deva,—all three works accompanied with complete indexes. The whole is calculated for 7 Rs., of about 320 pages each.

The author requests the patronage of the Asiatic Society for his undertaking, and as its success partly depends on the number of subscribers, I would propose that the Society subscribe for twenty copies, to be paid from the Oriental Fund.

3. In a letter received by the last overland mail, Mr. Koenig repeats a request, made by him already sometime ago, that the Society be pleased to despatch to him regularly every month, through Messrs. Allan & Co. 25 copies of the Asiatic Journal, either on payment or in return of books printed in Germany, or in countries connected with it. As there are a great number of Oriental works printed in Germany that are not in our Library, I would suggest that Mr. Koenig's proposal be accepted by the Society. I annex a list of some of the works, alluded to. (No. 1.)

4. With a view to procure a more extensive circulation for the *Bibliotheca Indica* and to make the best use of the works, patronised by the Society, I beg to recommend :—

1. That a copy of the *Bibliotheca Indica* and of Dr. Hæberlin's Sanscrit Anthology, be presented to such Societies and scholars as have favoured the Society with their publications. I forward, for the approval of the Society, a list of parties entitled to this mark of attention on the part of the Society. (No. 2.)

2. That the Members of the Oriental Section should also receive a copy of the Oriental Journal.

3. That a copy of Mr. Hodgson's work, "On the Aborigines of India, and of Mr. Laidlay's translation of Fa Hian from the French, be given to such Members of the Society as may apply for them.

I have the honour to be, Sir,

Your most Obedient Servant,

E. ROER,

Co-Secretary Asiatic Society, Oriental Department.

## No. 1.

1. Kritische Grammatik der Sanskrit Sprache in kürzerer Fassung, von Fr. Bopp. Zweite Ausgabe, Berlin, Nicolai, 1845.
2. Kortfattet Sanskrit Formlære of N. L. Westergaard. Kjöbenhavn, 1846.
3. Über einige ältere Sanskrit Metra, von G. A. Ewald, Göttingen, 1827.
4. Sanskrit Chrestomathie, von O. Böthlingk, St. Petersburg, 1845.
5. Sanskrit Læsebog of N. L. Westergaard. Kjöbenhavn, 1846.
6. Indische Gedichte in deutschen Nachbildungon, von A. Hoefer. Leipzig, 1844, 2 Vols.
7. Brihadāranyaka, &c., herausgegeben von L. Poley. Bonn, 1844.
8. Bruchstücke aus Walmiki's Rāmāyana, übersetzt von A. Holtzmann. Karlsruhe, 1841.
9. Rāma, ein indisches Gedicht nach Walmiki, von A. Holtzmann. Karlsruhe, 1843.
10. Ueber die Sprache und Weisheit der Indier, von Fr. Schlegel. Heidelberg, 1808.
11. Nala. Aus dem Sanskrit übersetzt, von J. G. Kosegarten, Jena, 1816.
12. Nal und Damajanti, von F. Rückert. Frankfurt, 1828.  
Zweite verbesserte Auflage, 1838.  
Dritte Auflage, 1845.
13. Bhagavad Gita, ed. A. Schlegel. Second Edition. Bonn, 1846.
14. Brahma-Vaivarta Purāna, Specimen. Ed. A. F. Stenzler. Berol. 1829.
15. Devimahātmyam, Mārkanḍeyi Purāni sectio. Ed. L. Poley. Berol. 1844.
16. De nonnullis Padma-Purāni capitibus. Ed. A. E. Wallheim. Berol. 1831.
17. Fünf Gesänge der Bhatti-Kavya, Aus dem Sanscrit von C. Schütz. Bielefeld, 1837.
18. Bhāravi's Kirātārjunīyam. Aus dem Sanskrit von C. Schütz. Bielefeld, 1845.
19. Māghas, . . . der Sisupāla, übersetzt von C. Schütz. Bielefeld, 1837.
20. Bhartrihari's Sententiae. Ed. P. a Bohlen. Berol. 1833.
21. Ghatakarpara, ed. G. M. Dursch. Berlin, 1828.
22. Mahamudgara, Sanscrit et Germ. Ed. H. Brockhaus, 1841.
23. Urwasi, der Preis der Tapferkeit, übersetzt von K. G. A. Hoefer. Berlin, 1837.
24. Probodha Chandrodaya. Krishna Misri Comœdia. Ed. H. Brockhaus. Leipzig, 1845.
25. Probodha Chandrodaya. Königsberg, 1842.



26. Hitopadesa, übersetzt von M. Müller. Leipzig, 1844.
27. T. H. Windischmanni Sancara, sive de theologumenis Vedanticorum. Bonn, 1833.
28. Alt-Indische Geburtshülfe, von J. A. Vullers. Giessen, 1846.
29. Das alte Indien, von P. v. Bohlen.
30. Bernfeyr Altindische Literatur (?).
31. Boller's Sanskrit Grammatik.

*To these works I add a list of some other Sanskrit publications, not in our Library.*

1. Dasakumāracharitra, by H. H. Wilson. London, 1846.
2. Vedānta Soutras, par L. Poley. Paris.
3. Elements of the Sanscrit language, by W. Price. London, 1823.
4. Grammaire Sanscrit-Française, par M. Desgranges. Tome I. Paris, 1845.
5. Grammar of the Sanscrit Language, by Williams. London, 1846.
6. Monuments littéraires de l'Inde, par A. Langlois. Paris, 1826, 1 Vol.
7. Etudes sur les hymnes du Rig-Veda par F. Neve. Louvain, 1842.
8. Oupanischat, par L. Poley, (Liv. 1—6). Paris, 1 Vol.
9. Kāthaka Oupanischat, traduit par L. Poley. Paris, 1835-4.
10. Mundaka Oupanischat, traduit par L. Poley. Paris, 1836.
11. Kena et Isa Upanishad, Sanscrite, Gallice et Persice, ed. G. Panthier, 1837.
12. Rāmāyana, poemo Indiana di Valmiciis, per G. Gorresio, 3 Vols. 1843—1845.
13. Fragments du Mahābhārata, traduits en Français, par Th. Panie, Paris, 1844.
14. Le Bhāgavata Purana, traduit, publié par E. Burnouf, 2 Vols. Paris, 1840—1844.

#### No. 2.

1. Royal Asiatic Society of London.
2. University of Oxford.
3. ————— Cambridge.
4. ————— Dublin.
5. ————— Christiania.
6. Asiatic Society at Paris.
7. Deutsche Morgenländische Gesellschaft.
8. Royal Academy at Berlin.
9. ————— Munich.
10. ————— St. Petersburg.

11. Branch Royal Asiatic Society in Bombay.

12. Literary Society at Madras.

13. College of Fort William.

14. Sanscrit College at Calcutta.

15. ————— Benares.

16. Bishop's College.

17. Tattwa Bodhini Sabhha.

18. Honourable J. Thomason.

19. Mr. J. Muir.

20. Raja Radhakant Deb.

21. Professor H. H. Wilson.

22. Professor E. Burnouf.

23. Professor J. Mohl.

24. Major Troyer.

25. Mr. Panthier.

26. Dr. M. Muller.

27. Baron Hammer-Purgstall.

28. Professor Chr. Lassen.

29. Mr. F. Rückert.

30. Dr. Weber.

31. Professor Böttlinck.

32. Professor Fr. Bopp.

33. Dr. J. Mill.

RESOLVED, That the Society adopt those suggestions contained in this letter which are approved of by the Oriental Section, but with reference to the transmission to England of the MS. of the Rig Veda now in the Society's Library, it is contrary to the established rules of the Society, and cannot be sanctioned—Dr. Roer however is authorized to communicate with Dr. Müller, and should that gentleman require a copy of the MS. in question, to offer to prepare a copy at his expense.

Read extract of a letter from Mr. Hodgson, offering to send down a valuable collection of drawings illustrating the Antiquities and Architecture of Nepal, should it be the Society's intention to carry out the work proposed some months ago on the Archæology of India.

The Secretary submitted to the Society for purchase a copy of the *Tarikh-i-Abu Sazad*, for 33 rupees. Referred to the Oriental Section.

JAMES WM. COLVILLE, *President*.

H. WALKER, *Officiating Secretary*.

## LIBRARY.

The following books have been received since the last meeting:—

*Presented.*

A sketch of the war with Tippu Sultan. By Lieut. R. Mackenzie, 2 Vols.—  
PRESENTED BY PRINCE GOLAM MUHAMMAD.

Asiatic Annual Register, Vol. XI.—BY THE SAME.

A view of the Origin and Conduct of the war with Tippu Sultan. By  
Lieut.-Col. A. Beatson.—BY THE SAME.

A narrative of the Campaign in India which terminated the war with  
Tippu Sultan. By Major Dirom. London, 1793. 4to.—BY THE SAME.

An account of the war in India between the English and French on the  
coast of Coromandel, from the year 1750 to the year 1760. By R. O. Cam-  
bridge, Esq. London, 1761. 4to.—BY THE SAME.

British India Analysed. London, 1795, 3 Vols. 8vo.—BY THE SAME.

Salmond's Review of the Origin, Progress and Result of the decisive war  
with the late Tippu Sultan. London 1800. 8vo.—BY THE SAME.

The captivity, sufferings and escape of James Scurry, who was detained  
a prisoner during ten years in the dominions of Hyder Ali and Tippu Saheb.  
London, demi 8vo.—BY THE SAME.

Authentic Memoirs of Tippu Sultan, by an officer in the East India Service.  
Calcutta, 1820.—BY THE SAME.

An Historical Sketch of the Princes of India. Edinburgh, 1833. 8vo. BY  
THE SAME.

Journal of the American Oriental Society, Nos. I. II.—BY THE SOCIETY.

Jahrbücher der Literature for 1847. BY THE BARON VON HAMMER  
PURGSTALL.

The Prem Sagar : translated into English. By Capt. W. Hollings. Cal-  
cutta, 1848.—BY THE TRANSLATOR.

The Bytal Pucheessee, translated into English. By Capt. W. Hollings.  
Calcutta, 1848.—BY THE SAME.

Annales des Sciences Physiques et Naturelles d'Agriculture et d'Industrie,  
publiées per la Société Royale d'Agriculture, etc. de Lyon. Tome X.—BY  
THE SOCIETY.

Bulletin de la Société de Géographie. Tome VIII.—BY THE SOCIETY.

Annales de la Société Linnéenne de Lyon. Années 1845-6.—BY THE  
SOCIETY.

Zeitschrift der Deutschen morgenländischen Gesellschaft, herausgege-  
ben von den Geschäftsführern. Erster Band, Heft I.—IV. Zweiter Band,  
I.—III. Heft.—BY THE EDITORS.

Jahresbericht der Deutschen morgenländischen Gesellschaft, für 1845-6.  
—BY THE EDITOR.

Report of the Calcutta Public Library, for 1848-9.—BY THE CALCUTTA  
PUBLIC LIBRARY.

Journal of the Agricultural and Horticultural Society of India. Vol. VI.  
Part IV.—BY THE SOCIETY.

Journal of the Indian Archipelago. Vol. III. No. 3.—BY THE MADRAS  
LITERARY SOCIETY.

Madras Journal of Literature and Science, Vol. XV.—BY THE SAME.

The Oriental Baptist, No. 29.—BY THE EDITOR.

The Calcutta Christian Observer for May 1849.—BY THE EDITORS.

Upadeshaka, No. 29.—BY THE EDITOR.

The Oriental Christian Spectator, Vol. X. No. 3.—BY THE EDITOR.

Tattwabodhini Patricá. No. 69.—BY THE TATTWABODHINI SABHA.

Rede des Präsidenten der Kaiserlichen Akademie der Wissenschaften,  
Freiherrn von Hammer-Purgstall.—BY THE BARON VON HAMMER PURG-  
STALL.

Archiv für die Kunde Oesterreichischer Geschichtsquellen.—BY THE SAME.

Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften. Erstes  
Heft.—BY THE SAME.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for  
the month of February, 1849.—BY THE DEPUTY SURVEYOR GENERAL.

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# Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of May, 1849.

Lat. 22° 33' 28". 33 N. Long. 88° 23' 42". 84 East. Mag. Variation 2° 28' 36" East. Mag. Dip. 27° 45'.

Days of the Month.	Observations made at sunrise.						Maximum Pressure observed at 9th. 50m.						Observations made at apparent noon.						Observations made at 2h. 40m.						Minimum Pressure observed at 4 p. m.						Observations made at sunset.						Maximum and Minimum Thermometer.				Rain Gauges.		Days of the month.
	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Maximum.	Mean.	Minimum.	Maximum.	Upper.	Lower.							
		Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.									Of the Mercury.	Of the Air.	Of Wet Bulb.	Of the Mercury.	Of the Air.	Of Wet Bulb.	
1	29.676	80.7	81.8	79.7	S. W.	Cumuli.	29.727	92.4	93.9	81.7	S.	Clear.	29.681	100.0	99.9	78.8	S. W.	Clear.	29.618	101.2	99.6	79.3	S.	Clear.	29.580	98.4	96.8	78.3	S.	Clear.	29.594	91.4	90.9	82.9	S.	Cirro cumuli.	104.0	92.9	81.7	116.2	..	..	1
2	.690	80.8	81.3	78.8	S.	Clear.	.769	92.8	93.4	83.6	S.	Ditto	.734	98.4	98.2	85.0	S. S. W.	Ditto	.669	103.8	103.0	82.9	S. S. W.	Ditto	.642	102.8	100.7	83.9	S.	Ditto	.662	93.9	92.3	82.4	S.	Clear.	105.7	93.6	81.4	123.9	..	..	2
3	.741	81.8	82.2	79.7	S.	Ditto	.777	93.2	92.9	83.3	S.	Ditto	.763	99.2	98.3	83.4	S.	Ditto	.679	102.2	101.3	80.8	S.	Cumulo strati.	.656	100.8	98.8	80.2	N. W.	Cloudy.	.672	92.2	91.8	75.2	S. S. W.	Cumuli.	103.8	93.1	82.3	119.0	..	..	3
4	.718	82.5	83.4	80.0	S. E.	Cloudy.	.761	92.4	91.7	81.8	S. E.	Cumulo strati.	.734	97.0	96.1	82.4	S. W.	Cumulo strati.	.646	100.9	98.8	82.4	S. E.	Ditto	.603	100.2	98.0	81.2	N. N. E.	Cumulo strati.	.636	92.8	89.4	79.4	S. E. sh.	Nimbi.	101.9	92.1	82.3	118.7	0.38	0.46	4
5	.764	78.4	79.2	76.0	N. W.	Cirro cumuli.	.867	89.7	87.9	80.1	N. N. W.	Cirro cumuli.	.831	94.0	92.7	78.7	W. S. W.	Cirro cumuli.	.760	96.2	93.4	81.9	S.	Ditto	.702	93.7	90.9	78.9	S. S. E.	Ditto	.727	88.3	86.3	74.9	S.	Cirro cumuli.	97.0	87.0	77.0	115.0	..	..	5
6	.816	79.7	80.3	78.3	S.	Cumulo strati.	.873	92.0	91.3	81.3	S. S. W.	Clear.	.848	97.0	96.0	80.5	S. S. W.	Cumuli.	.758	100.8	98.9	80.7	S. S. E.	Ditto	.773	86.8	84.4	75.5	S. S. E.	Cloudy.	.782	81.8	82.7	76.6	S. W.	Drizzly.	101.7	91.1	80.5	119.0	..	..	6
7	.827	79.4	79.7	75.9	S. E.	Cloudy.	.884	89.4	88.7	80.4	S. S. E.	Cirro cumuli.	.843	94.2	93.8	79.3	S. W.	Cumulo strati.	.743	98.0	96.7	80.8	S. W.	Ditto	.725	90.0	84.6	74.2	E. S. E.	Rain & Thun.	.751	78.8	80.0	75.4	S.	Cloudy.	99.5	89.7	79.8	120.6	1.20	1.28	7
8	.792	78.9	79.4	77.8	S. S. E.	Cirro cumuli.	.830	89.8	88.3	80.8	S. W.	Ditto	.789	93.3	91.3	81.9	S.	Ditto	.698	93.0	..	..	S. E.	Cloudy & Thun.	.682	93.2	..	..	S.	Cumulo strati.	.711	83.7	..	..	S. E.	Cirro strati.	96.3	87.6	78.2	117.0	..	..	8
9	.743	78.0	..	..	S.	Ditto	.790	90.3	..	..	S.	Cumulo strati.	.744	96.3	94.9	81.8	S.	Ditto	.656	95.0	88.4	77.9	S.	Cumulo strati.	.640	95.3	93.9	78.2	S.	Ditto	.654	89.0	88.0	78.2	S.	Cumulo strati.	99.3	89.1	78.6	121.4	..	..	9
10	.698	75.8	76.3	73.0	S. S. E.	Clear.	.762	92.7	89.8	81.5	S. E.	Ditto	.718	95.7	93.4	81.4	E.	Ditto	.637	97.3	92.0	80.0	S. E.	Ditto	.639	91.7	89.2	76.9	S. E. sh.	Ditto	.675	83.7	82.7	75.9	S. E.	Cirro.	98.3	87.0	75.7	119.7	..	..	10
11	.651	76.9	77.3	75.3	E.	Cloudy.	.713	88.0	86.7	77.8	E.	Ditto	.689	91.2	89.3	78.9	N. E.	Ditto	.588	93.4	91.1	79.4	N. E.	Ditto	.564	93.4	90.6	78.9	E.	Ditto	.599	87.9	87.0	77.9	E.	Cirro cumuli.	94.3	85.9	77.4	119.9	..	..	11
12	.559	78.7	78.8	75.8	N. E.	Ditto	.588	84.3	83.7	77.7	N. E.	Cloudy.	.547	86.2	83.7	78.4	N. N. E.	Drizzly.	.487	88.1	86.7	77.7	N. E.	Ditto	.459	88.4	87.0	77.2	N. E.	Cloudy.	.478	85.7	85.6	76.4	N. N. E.	Cloudy.	89.3	83.7	78.0	101.2	..	..	12
13	.510	77.3	77.8	75.5	N. W.	Cirro strati.	.564	90.0	88.6	79.0	S. W.	Cumulo strati.	.524	93.6	92.0	80.0	W. S. W.	Cumulo strati.	.440	96.0	94.7	79.8	S. W.	Ditto	.428	96.4	94.2	79.8	W. S. W.	Cumuli.	.451	92.9	91.7	79.8	E. S. E.	Scattered clouds	97.0	87.5	78.0	115.2	..	..	13
14	.489	82.9	83.8	81.8	S. S. W.	Cumuli.	.532	94.5	93.0	83.4	S. W.	Ditto	.490	97.6	95.7	83.4	S.	Ditto	.404	99.2	97.8	83.8	S.	Cumuli.	.354	97.8	96.3	84.1	S.	Cirro cumuli.	.488	92.0	86.0	78.0	E.	Rainy.	100.0	91.8	83.5	113.4	1.90	2.00	14
15	.523	78.6	80.2	77.3	S. S. E.	Cloudy.	.562	90.3	89.6	83.2	S.	Cloudy.	.537	93.2	92.8	83.5	S. W.	Ditto	.475	94.8	93.9	84.3	S. sharp.	Ditto	.445	93.8	92.3	83.0	S. sharp.	Cloudy.	.479	88.5	88.3	81.5	S.	Cirro strati.	95.4	84.5	73.6	105.0	..	..	15
16	.553	84.6	85.3	81.2	S. S. W.	Ditto	.589	92.3	91.7	81.5	SSW sh.	Cumulo strati.	.558	94.6	94.0	83.2	S. W. sh.	Ditto	.494	95.5	94.8	84.3	S. sharp.	Ditto	.472	94.4	93.3	83.0	S. sharp.	Cumulo strati.	.529	89.2	89.0	82.0	S.	Cloudy.	96.3	90.7	85.0	106.8	..	..	16
17	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	17		
18	.536	77.2	77.4	74.5	E.	Cloudy.	.565	90.6	90.4	82.3	S.	Cumulo strati.	.536	93.5	92.9	83.3	S. W.	Cumulo strati.	.481	93.9	93.0	83.0	S. W.	Cumulo strati.	.425	93.3	92.0	83.2	S. W. sh.	Cumuli.	.487	88.3	88.2	83.2	N. E.	Cloudy.	95.0	86.1	77.2	105.0	0.08	0.12	18
19	.538	77.7	78.0	75.0	E.	Ditto	.578	87.6	88.8	82.8	S.	Cloudy.	.570	93.4	93.2	84.2	S.	Ditto	.514	97.0	96.0	84.3	S. W.	Cumuli.	.498	97.3	95.1	83.6	S. S. E.	Cumulo strati.	.536	90.0	88.0	79.0	S. E.	Ditto	97.8	85.0	72.2	111.0	0.68	0.74	19
20	.602	77.2	78.3	75.3	N.	Ditto	.677	82.8	82.8	77.7	E.	Cirro cumuli.	.660	89.6	89.7	81.8	S. S. E.	Cirro cumuli.	.596	93.3	92.5	82.3	E.	Cumulo strati.	.571	94.7	93.0	82.0	S. E.	Ditto	.594	89.9	89.2	79.5	S. S. E.	Generally clear.	94.8	83.9	73.0	112.8	..	..	20
21	.654	78.7	79.5	76.0	S. S. E.	Cirro cumuli.	.696	92.0	90.4	83.4	S. E.	Cumuli.	.696	95.3	93.2	82.8	S. E.	Cumulo strati.	.612	97.6	94.9	82.0	S. E.	Cumuli.	.580	96.7	94.0	82.0	S. S. E.	Clear.	.560	90.7	89.8	80.4	S. E.	Clear.	97.8	88.3	78.8	112.0	..	..	21
22	.606	82.4	83.2	80.8	S. E.	Ditto	.674	92.3	91.9	83.3	S. S. E.	Cumulo strati.	.648	95.6	94.7	83.7	S. S. E.	Ditto	.573	98.0	95.3	82.6	S. E.	Ditto	.520	96.1	93.2	82.2	S.	Cirro cumuli.	.542	89.9	89.0	80.0	S.	Cirro cumuli.	98.2	90.6	83.0	112.8	..	..	22
23	.523	81.9	82.3	80.2	S. S. E.	Clear.	.585	93.8	92.3	83.7	S.	Ditto	.555	97.6	96.1	83.7	S. W.	Cumuli.	.493	98.3	95.6	83.3	S. E.	Ditto	.476	96.9	94.3	81.7	S. S. E.	Cumulo strati.	.481	90.5	90.2	81.3	S.	Clear.	98.7	90.5	82.2	111.0	..	..	23
24	.553	81.9	82.2	79.6	S.	Cloudy.	..	..	..	..	..	..	..	..	..																												





# JOURNAL

OF THE

# ASIATIC SOCIETY.

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JUNE, 1849.

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*Notes on the Geography of Western Afghanistan. By Major WILLIAM ANDERSON, Bengal Artillery.*

Any person attempting comparative Geography, soon learns how very little dependance is to be placed on the geographical written proper names of even the best classical authors ; words evidently intended to be identical, may be traced through all possible forms of spelling, exhibiting any near approach to each other. It occasionally happens, that authors of no repute may from accidental circumstances have learnt the real correct form of a word, of which the most learned commentator has been entirely ignorant. The Greek and Latin geographical writings on Asia are chiefly composed by learned authors, in their closets, from laborious studying and reading of more ancient works of travel and of history ; little discrimination was exercised over the various facts, in rejecting repetitions or in distinguishing between the same relation given, with only a few slight variations of circumstances ; hence, the greater accumulation of error will be found in the latter authors, who often contain undigested all those mistakes to be found in previous writers. Very little dependance can be given to the names of places, distances, directions or bearings, in the relation of the movements of the soldier, merchant or mere traveller ; they are often, I suspect generally, subsequently compiled from memory, than which nothing can be more treacherous or liable to err. Let any one attempt from mere recollection to recall any long line of marching ; and he will often, very often find himself unable to determine with precision which places preceded each other in the route, although he may be able to give a very fair



general account of the whole line of march, and a particular version of many occurrences. The relation of time and order is not well remembered. Many intermediate points between two important ones are often entirely forgotten and omitted, or misplaced. Almost the whole of the details of the geography of Asia were obtained by the Greeks and Romans from the hearsay evidence of travellers and merchants; it was hence less to be relied upon as the distance explored was greater. It certainly was not the custom of earlier times, for merchants to make the venture of the entire line of traffic; the merchandize of Hindustan was carried by Indian merchants to Afghanistan; by the merchants of this country to Persia; and by the traders of this quarter to Syria or Egypt, and so on; the inhabitants of one end of this chain, received but a very confused and indistinct account of the proceedings of those at the other end. Yet much of the information so obtained, is now matter of geographical comparison. Let the confusion made in Asiatic names by Europeans of the last century be borne in mind and then we shall not be astonished at the little progress now made in tracing out the districts and nations of antiquity; the more so when we add the errors of copyists for 2000 years. Nor are we quite assured of the real measure of all the terms used for distance, time, weight, or motion.

The attempts to graft measured distances, or assumed travelled distances, on positions established by astronomical principles, is also a constant source of error; as little allowance is given for the reduction necessary to constitute a right line; or to the difference of the length of the degree under different latitudes. It is this last error which has carried out all places in central Asia, so far to the East of their proper position.\*

The intermixture of systems has also caused endless trouble. The travels of one man are conceived in his mind, and perhaps so written down, on a certain scale, those of a second writer on a greater or a less scale, while a third person, attempting to combine the two on the idea of their being formed on an equal mental measure, would produce most erroneous results—it is this which transposes places on the maps. Also is to be remembered another constant but now untraceable error, confu-

\* The error of a traveller being well established between some determined places, might enable his whole work to be reduced to an approach to fact.

sion in the meridians whence the longitude is to be measured.\* From these and many other causes I believe the greatest license may be taken in fixing towns or districts or people, which are not firmly determined by more than one proof or argument.

The usually accepted measures are,

1.087 Greek stadii = 1 English furlong.

8.69 „ „ = 1 English mile.

125 Roman passi = 1 Greek stadium.

135.8 „ „ = 1 English furlong.

1.087 Roman Millia passuum 1 English mile.

These are founded on the passus being considered what in England would be called a double pace—or supposing the legs to be viewed as a pair of compasses; one foot fixed in the centre and the other describing a circle, the English pace is the radius, but the Roman passus the diameter.†

Again, are to be well distinguished the natural divisions of countries as indicated by rivers and mountains; the proper or acknowledged districts as marked out by long established boundaries; the political as held under the temporal power, constantly changing of different dynasties; this last is a grand source of error in eastern travels. For instance, we find Kundahar noted as a province of Persia, of Herat, of Seestan, of India, of Kabul and even of Cashmír. Language, religion, and productions, also afford a means for classification.

According to Pliny, the Geographers of the Alexandrian expedition,

\* The first Meridian of Ptolemy is some point of the Canary Islands. Say W. 14°. Others consider the first Meridian to be some point of the Azores Say W. 24°. A difference of ten degrees, which we do exactly find to exist between some of the Arabian tables of Longitude. Others assume a western point of the mainland of Spain, and a few authors conceive the point to be a central town of Spain. Hence to mere map-makers the confusion.

† The Muhummadan measures are extremely variable and difficult to fix; the commonly accepted version is—

4000 Zurua = 1 Meel  $\frac{3}{2}$  Zurua = 1 Guz khuyatee.

3 Meel = 1 Fursukh 8000 Guz = 1 Fursukh.

Assuming the Zurua = 21 inches.

The Guz =  $31\frac{1}{2}$  inches.

The Fursukh = 3.97 British miles or 4.31 Roman miles.

The Arabian Meel = 1.32 English miles.

took a fresh departure from the Caspian Gates, and calculated 3000 stadii to Zariaspa, a city of Bactria, and 5000, more to the Jaxartes or modern Sehon; distances measured no doubt along a high road and from ferry to ferry of the rivers. S. 18, C. 16, Book 6, says:—

“A Caspiis ad orientem versus regio est Apavortene dicta, et in ea, fertilitatis inclytæ locus, Dareium.” This I conclude to be the modern Abeverd, or Bavurd, the district round Kelat; the birth place of Nadir; near it our maps do place a *Dereguz*. Justin says, the first Arsaces founded this place, Dareium, among the mountains of Zapaortenon; “Cujus loci ea conditio est, ut neque munitius ququam esse neque amœnius possit; Ita enim, et præruptis rupibus cingitur, ut tutila loci nullis defensoribus egeat; et soli circumjacentis tanta ubertas est, ut propriis opibus expleatur.”

Khojah Abdol Kureem, who accompanied Nadir on his return from the invasion of India, says:—“The town of Kelat is surrounded by high mountains so perpendicular as to be absolutely inaccessible; on the side of Meru is a large gate where the guards examine every person who goes in or out; this leads to a pass so narrow, as to admit only one horseman at a time, and over which the mountains meet at the top in a most astonishing manner; forming a natural arch. The canal upon which the cultivation of Kelat depends enters the town on the side of Mushud, and goes through the pass of Meru. Abiwurd is a populous town, it is also called Baward.” Kelat thus appears a very similar place to, if not identical with, Dareium; and in Abeward or about Mushud, we have the centre or starting point of the Parthian nation,\* a desideratum in ancient history. Next, to the eastward we may trace *Margiane* in the modern Moorgab. And in Merve-ol-rood, or Merve,† on the river, I have no doubt we may accept the city built by Alexander, destroyed by the barbarians and restored by Antiochus. Pliny uses the words “interfluente margo.” Isidor adds, “Ἀντιοχεια ἡ καλοῦμενη ἐν ὑδροῶς,” all pointing to the designation still maintained in “Merve-

\* It is worthy of observation as a curiosity, the introduction by Justin of the letter Z as in Zapaortenon. This is as an example of the dependance to be placed on proper names. Our printed words have obtained a prescription of correctness to which perhaps they are all ill entitled.

† This second Merve has been placed by some writers, either on the banks or close to the Oxus; and hence carried to the North of Merve Shahjuhan; in place of being some 80 miles South-East of this place.

ol-rood." Orodes here carried his prisoners after the defeat of Crassus. From it, over the mountains of Caucasus existed, as at present, the road to BACTRIA, (Balkh :) Of the numerous tribes mentioned by Pliny, I can only speculate on *Ochani*, which may have reference to the Ooghans. The *Harmatotrophi* "qui curules equos alunt" as having some connection with Andakhoo or Muimoonuh, very celebrated marts for large Turkomanee horses.

CANDARI are the tribes of Kundahar. Paricani those of Furah. Sarangæ those of Zurung. The Gelæ, quos Græci Cadusios, appellaverunt, may be the modern Kords round Mushud, or the inhabitants of Ghoor. Heraclia built by Alexander, destroyed by the natives, restored by Antiochus, and called Achaida, looks very like the oft repeated history of Herat.

I am inclined to consider the Ochus and Oxus to be the same river under different modes of writing, a mistake created by the mal-location of Merve-ol-rood. The present stream of Bulk, called the Bulkhab, is certainly not navigable, and its water does not in all seasons reach the Oxus.

The *Sariphi* mountains, dividing Aria from Margiana, are those round Surukhsh. The river *Jaxarte*, quod Scythæ *Silin* vocant; "has a very near approach to the modern term of Sehon. In seven days it was reported to Pliny goods could be carried from India (Kabul, its frontier) to the Icarum river of Bactria, flowing into the Oxus, and down that river into the Caspian, and hence be distributed over Asia Minor from the river Kur or Cyrus." No doubt goods might reach the Oxus in seven days from the top of the ranges, the frontier of India; the only real omission in this very general outline being the second land trip from Kheva to the Caspian. For in these mountainous districts there can hardly be rivers navigable for boats; their course is too rapid, their beds too rocky and the fall too great. I doubt if a boat exist in the country till the Oxus on the one side reaches the sandy deserts near Termez; or the Helmund on the other side debouches on the level flats of Gurmsail. But roads all lie along the beds of these streams, for the sake of water or of passage round the rocks,—hence a native going from Guznee to Kundahar invariably adds, "down the Turnuk," or "down the Argundab," without the slightest idea of the intervention of a boat. Icarum has a shade of the word Ghor, which



would thus be the stream passing Kunduz ; this process would occupy, as it does at present, the merchants, of four nations. The routes of merchandize depend chiefly on the safety of the roads and protection afforded by chiefs, as well as on the seasons ; my belief, nay my experience is, that mere traders are entirely ignorant of every thing beyond their own beat of trade. The Lohanee merchant of Guznee who brings the beautiful fruits of Kabul to the imperial city of Delhi, could give on his return home but a very imperfect account of how the same fruit reached the port of Calcutta, and so it was in the days Pliny wrote. The following are given by this author as the distances measured by Diognetus and Boeton, with the army of Alexander.

	Roman Miles.	Perhaps.
From the Caspian gates, to Hecatompylos, ..	133	
,, to Alexandria of Aria, .....	566	Herat.
,, to Prophthasia, .....	199	Furah ?
,, to Arachotiorum oppidum, .....	515	Kundahar.
,, to Orto spanum, trivium e Bactris, .....	250	Near Guznee.
,, to Alexandria sub-Caucasa, .....	50	Near Mydan.
,, to the river Copheta et oppidum Peucolaitin,	227	Peshawur.
,, to the Indus and Taxila, .....	60	Atock.
,, to the Hydaspes, .....	120	Jhelum.
,, to Hypasis, .....	29½.	[Either this river is intended for the Acecines, or as I find some one has indicated by a pencil note in the Asiatic Society's copy of Pliny, that CL. have fallen out from the CLXXIX. in the distance of 179 miles.]

The name Imaus, *Hemálaya*, in the language of the natives signified “*Nivosum*,” or covered with snow.

Having worked round the coast of India Pliny returns up the Indus, to the Peucolaitæ, Arsagalitæ, Geretæ, Asoi ; the former of whom are identified in *Pukulee*, and the last may be the modern *Esa* nation ; for no less a term than nation will describe the present *Esa* Khuel. Four provinces are then mentioned which were by some considered as Indian, by some made Persian.

Mountains surrounded the districts next the Indus river. One province was called Capissene—had a capital Capissa, *καπίσα*, also written Caphusa ; this capital was destroyed by Cyrus. The city and district

had clearly the same name. I am inclined to assume that Capis and Kabul are intended to represent the same word.

Another of these four provinces is Arachosia, with a capital and river of the same name; which last some considered to be the river indicated by the term Cophen. The town was built by Semiramide.

The river Erymanthus flowed past Parabesten of the Arachotii.\*

To the South of the Arachotii was the third Province of Gedrosia; probably round the modern Kedje. To the north was the fourth of the Parapamisadæ. In this last district, there is mention made of a city called *Cartana*, under the mount Caucasus; afterwards called *Tetragonis*. Also of Alexandria in Bactria, and of another city of this name under Caucasus. Tribes are called Syndraci, Dangalæ, Parapiani, Cantaces, Maci.

*Cartana* has a trace of reference to the Ghor of Ghorbund, and Charikar may have relation to *Tetragonis*; Parapiani has been considered to exhibit a vestige of Hupian, north of Estalif.

If the Par, Por, Boor may be thus relinquished, I would propose Bamean as a type of Pamisus or Bamis; we might almost fancy the range of Para Khoaltrus being but Kohulturusuh or Mount *Taurus*! so Para Pamisus; and assuredly in Arabic or Persian باامسان and باعیمان would be hardly distinguishable.

Huree, *Aria*; Eeran, *Ariana*, are often confounded together; in regard of the former Pliny mentions; cities Artacoana and Alexandria on the Arius; the river being clearly the Huree rood, also Artacabane restored by Antiochus.

A people are called Dorisci.

One river is named Pharnacotis, and a second Ophradus, probably the *Furah rood*; Prophthasia is given as a city of Zurung, hence of Seestan.

With respect to the ranges of mountains, Caucasus, КОН-КОШ is used as a term for the whole; Paropanisus or Paropamisus, for those towering above Kundahar and Guznee. The Emodus constitutes the

\* This is clearly the modern Best, the prefix *Para* may be a misreading, or may be but the word Poor or Boor, used for city, as the "town of Best." It might be well known that there was both a capital and a river in the district of Arachotia, although their proper names were unrecorded. Arabian authors all attribute the foundation of Kundahar to a queen of Arabia, perhaps Assyria, called Bulkees.

Northern, and Imaus the Eastern and Southern branch of the grand Hemálayan chain. The whole of Pliny's references to these parts bear the appearance of an assemblage in a common-place book of all that could be found relating to them in other works.

Mistaking places of the same or nearly the same name, but of entirely different locality, has led to much confusion, of which the following appears to me an instance. "On the borders of Bactria, conterminous with India, is the district of Choarene, the nearest country to India occupied by the Parthians; according to Strabo it is 1900 stadii from Ariana, and yet he says Craterus marched through it on his way from India, to the country of the Arachoti, which would bring it within the limits of Ariana itself. The statements are clearly incompatible, and it is not easy to conjecture a situation for a province of which no other notice occurs." Such is an extract from Wilson's Ariana. But if we accept Bactria for *Bakhtur*, as considered by Moslem authors; including Gurmsail and the countries N. W. of the Helmund, and read Kharan for Choarene, we have a province which shall fulfill all these required conditions.

The Nuzuhut-ol-Kuloob of Humdallah Kuzweenee, gives the following routes and distances:—

Rue

Dure ameen,.. 6 The Wurameen of maps—once a large town of Rue.  
The Dur may have reference to Pylœ.

Khawur, .... 12

Ras-al-Kulb,.. 12

Semnan, .... 10

Damghan, .. 20 Supposed to be Hecatompylos.

Bostam, .... 13

Jajurum, .... 23

Neshapore, .. 42

Boochegan, .. 38

Herat. .... 30

Polybius says Hecatomphilos takes its name, "for that all the passages of the neighbouring countries join there;" now Humdallah makes two roads from Khorasan unite near Damghan; but from Bostam he carries off the grand northern road to Kharism, which is more in the sense of Polybius. From Bostam to Herat is 133 Fursukhs  $\times 4.25 =$

566 Roman miles ; from Semnan to Bostam is 33 Fursukhs  $\times$  4.25 = 140 Roman miles, to meet Pliny's 133.

To cover the distance of 199 Roman miles to Prophthasea, we have the distance measured by the British Embassy from Herat to Sheheruk, on the Furah road, of 131 British miles, with 20 more to reach the old city of Furah ; and as this was the very shortest cut for a small party, we may grant that the large Army of Alexander, marching with the waters, would have covered 183 British miles, or 199 Roman miles to near this spot,—I believe a numerous party would go round the range to the south of the city of Herat.

The 515 Roman miles to Khundahar is not so easily established ; but I believe Alexander, in taking the city or capital of the Zurungæ of Seestan, to have marched round the lake of Seestan and up the Helmund to Best, and thence to Kundahar.

An intelligent sergeant of sappers fixed the Fort of Joween in Lat.  $31^{\circ} 31' 56''$ . The Latitude given for Zurung by most Arabian and Persian authors is  $30^{\circ} 30'$ .

The distances will then stand :—

Furah to Joween,.....	20	.....	20
Zurung, .....	44	.....	44
Direct over the desert to Ghereesh, 118 ; if by the			
		banks of the	
		Helmund	186
To Kundahar, .....	75	.....	75
Total, ....	257		325

Hence there is a deficiency of 190 miles to make up the 515 of Pliny. It is not impossible that this may be an error ; and it is strange that in the last distances of his route, from the Hydaspes to the Hypasis, we find an apparent omission of 150 ; the grand total being nearly correct.

In the Geography of Moses of Chorenene, written in the Armenian language in the fifth century, and translated into Latin in 1736, we find a list of the districts forming many countries of the East ; and from them we might expect names obtaining previous to the Moslem conquests ; but alas ! the nearest approach to most of them are not satisfactory ; but



as it often happens that a second reader may hit on a word which has escaped the search of a previous one, therefore I have copied the names, although the authenticity of the work is doubtful.

Persia is called Chuste Neemroz, touching the eastern border of Chuzastan, and the confines of Media ; containing twenty Provinces.

Pers <i>idem.</i>	Pars.
Aspahan <i>iam.</i>	Esfuhan.
Mesun <i>iam.</i>	Mazunderan ?
Hacar <i>iam.</i>	
Panat <i>iam.</i>	
Cerman <i>iam.</i>	Kerman.
Curan <i>iam.</i>	Kharan.
Macuran <i>iam.</i>	Makaran.
Send <i>am.</i>	Scinde, lower.
Hend <i>am.</i>	Hind ; round Ser-Hind.
Meran <i>am.</i>	Mehran ; banks of the Indus, upper Scinde.
Petvastan <i>iam.</i>	Punjabistan.
Segastan <i>iam.</i>	Segestan.
Aplastan <i>iam.</i>	Afghanistan ?
Deram.	Delum, in the Persian Gulf.
Melam.	Malia.
Mahic <i>iam.</i>	Mahie, of Cambay.
Maun <i>iam.</i>	Mandavie, a place of considerable trade.
Chozerhasan <i>iam.</i>	Khezeristan.

Palham.

Ebuham.

Rhesira Parhasania. Producing the best Pearls. Bahrien.

Aria, is called Chuste Chorasania ; lying between Media, Persia, the Caspian and India.

Comis <i>ia.</i>	Comis.
Hyrchan <i>ia.</i>	Goorgan, Hoorkan.
Apersaria.	Abewurd ?
Meru <i>ma.</i>	Merve.
Arovastia.	Arachotia ? Hureeswatia ? Kundahar ?
Rheucatesania.	
Nestimanaca.	
Beznia.	Boozjan, near Jam ?

Salcan <i>ia</i> .	Talkan.
Docan <i>ia</i> .	Damghan?
Anaplia.	
Heru <i>ma</i> .	Huree; Herat.
Zambyr <i>us</i> .	Subzwar?
Naxeria.	Neeshapoor?
Dezina.	Zoozen.
Avazachia.	
Varzania.	Beerjun?
Mansania.	Muzeenan?
Zaxtana.	Kohestan?
Bahlia que et Parthia.	Balkh.
Domatia.	Dumadutha; Dumadoot: or Deemut of Dumawund.
Larimanacia.	
Siria.	Saree?
Baricania.	
Dobonia.	

Scythia is called Apachtaria, *Bactria*, and *Turchia*, extending from the Volga to the Himalaya, even unto *Zenia*, *China*; it is inhabited by many nations, among them the Sogii, Thocarii, and Hephthalii.

Moses Chorenensis is considered to have written his history and his geography in the fifth century. It is clear, that he had consulted the works of Ptolemy and other Grecian as well as Latin authors,—but whether his Persian and Asian Geography is based on European or Eastern authority, is a question of interest to be decided. Perhaps other readers may hit on better identifications of the names than those I have given, and may add to the list. The time has reference to the reign of the great Buhram, of Persia, for whom Moslem authors claim extensive conquests in India, embracing Scinde, the Punjab, and the N. W. provinces of India round Sirhind. This last always appears to me as the districts indicated by the word Hind. If Aplastaniam is Afghanistan, this date destroys all the fanciful etymology of the Persians for the word, and certainly its position between Segistan and various ports on the sea coast, warrants the assumption.

And if Maunia be Mandavee, the conquests of the Persian kings by means of their ships were more extensive than is usually supposed.

From the intimate connection between Armenia and Persia we may fairly grant a distinguished scholar of the former country might have obtained a correct account of the names of the larger districts of the latter country, but whether the words are attempts to write spoken terms, or are transcripts in Armenian of originals in Zund Puhluvee, or Duree, is a question to be determined by those who have the knowledge and means. There runs an apparent analogy through the words, which warrants something better than mere spoken corruptions.

The Armenians interchange D with T ; B with V, and add an initial A.

The author would no doubt be in terms of friendly communication with the various Nestorian Christians scattered through Persia ; and from them obtain information ; thus Domatia, Dumadutha is recorded by the Nestorians as the seat of a bishop of their faith.

The next link in the geographical chain which is accessible to me, lies in the Persian works on this subject, or English translations from the Arabic ; for alas ! the original works are not procurable.

In a country where the revenue is almost entirely obtained from a tax on the various produces of the soil ; where with few exceptions the land and the water are considered as the property of the superior power, to be by it distributed, under reservation of portions almost rendered fixed and permanent by time and prescription, in such a country almost every fertile spot, every well-watered acre of land, is known perfectly by the durbar of the local authorities, and generally, though less minutely by the grand officers of the capital. Such lands are marked out as prizes to be obtained in jageers by the courtiers. A much greater amount of such statistical knowledge did exist in the revenue offices of the East, than it is usual to suppose. These offices could tell to a fraction, the names, area and production, of a particular place, although entirely ignorant of any data to position obtainable from Longitude or Latitude—the situations as known to them being determined by very general bearings from some capital, and the usual marches for travellers—or for revenue collectors. Thus if we examine any particular history of a place, Herat, for instance, we find recorded all the fertile spots, all the well filled canals, all the pretty villages ; their extent and fruits ; with the various places of pilgrimage, and all the wonderful productions of nature in hot springs, caverns, or

rocks, and last, but not least, the names of all learned or religious men to which the spot has given birth. All such are fully recorded, and had time spared sufficient particular histories, I believe a most complete general map could be produced.

Moslem authors do not forge facts of science, though they often misunderstand and misrepresent them ; and taking too much for granted, do not sufficiently distinguish and examine ere using the statements of others. More attention is paid to embellish a fact with words, tropes and epithets, than to examine the correctness of the fact, or its bearing to the subject under discussion.

I believe the names of places do not change to the extent supposed ; and that more is traceable to the mistakes of copyists and of readers, and to modern forcing of names, to suit particular theories.

We must also bear in mind, that the seat of the supreme authority has been so often removed, that there is hardly a district in the capital of which the dominant power over Southern and Western Asia has not resided. From Mecca it has advanced to Kofa, Baghdad, Merve, Bokhara, Sumurkund, thence retraced its steps to Khewa, Guznee, Seestan, Herat, Ardewan, Demascus, and Constantinople. Even Kara Korum, in Chinese Tartary has been the residence of a mighty chief, whose sway extended over the whole of Asia ; while Abewurd, Balkh, and even Kundahar, are not without their claims to be considered as royal residences. Hence in the various histories of these places, now lost, I have no doubt could be traced ample means to fill up all the blanks in all our modern maps.

The professed works on Geography, in which recourse has been taken to determine the positions of places by the means of latitude and longitude, are many, and of two distinct classes ; the first class embraces those of which the authors were both travellers and men of science, who could determine their own position at any period by rules of science, and reduce other neighbouring places to a fairly correct position, such I have no doubt were Ebne Huokul and Aboo Rehan ; both celebrated authorities on geography, whose original works would prove treasures of great value ; Although their absolute longitudes and latitudes are not very correct, when compared with the scientific calculations of modern days, still they were close approximations in the case of the latitude, to the truth,—sufficiently near to answer all the required



purpose. The longitudes are all far more remote from reality, and when extended over a long space, are nearly valueless ; still when the authors have been in person on the spots, the *differences* of both latitude and of longitude will be found nearly correct enough to determine the position of places at no great distance from each other. Thus would I give much weight to differences of bearings of places from Guznee, as a first meridian, when quoted from Aboo Rehan.

The second class, is that of historians and the framers of geographical dictionaries, who compile books from the labours of the first class. These form systems of their own, under which they endeavour in their studies to reduce the discoveries of others.

Some form lists according to the letters of the alphabet ; others according to the climates, and into these they insist on introducing all that can be found written by those who have preceded. No discrimination is used to discover either the correct reading of the written words, the proper position of the vowels and marks, the undoubted letters of the Abjud numeration giving the latitudes and longitudes, or lastly, the credit due to the authority ; and thus the more modern the author, the greater chance he has of containing the accumulation of all the errors on these points committed by his predecessors. Of the errors of the kind of not correctly reading the words, I can give an excellent example ; and a proof of how little dependance is to be placed on these written proper names.

Sir William Ouseley's translation, of what he considers Ebne Huokul, contains a list of the rivers of Herat, being in reality the various canals branching from the Huree rood, and watering the cultivation as far as certain villages on their banks of which the name of the most distant or principal is given ; these canals are 3 to 4 feet wide, and deep according to circumstances. Edresee contains a similar list ; and though I have no doubt in my own mind that the type of both is identical, yet hardly two words are now the same, and hardly one correct ; all this results from constant re-copying, and such is the worth of the labours of some of our best orientalists, and probably occidentalists.

Villages, as corrected by modern works and evidence.	Canals, as corrected from several mo- dern works and evi- dence of natives.	Names of the vil- lages as written in Ebne Huokul.	Names of the vil- lages as written in Edresee.	Names of the Canals in Sir Wm. Ous- ley's translation of Ebne Huokul.	Names of the Ca- nals as written in the printed copy of Edresee.
	پروانه و هوا دشک	سپیدا سنک	سندا سنکه	یرخوی	و حری
کرازان	آلنجان	سیرشیدان	سوسان	اردنجان	ارست
بغنی	غوروان وپا شتان	ورین	شعلته	نسکوکان	شکوکان
کواسان	کداره	کراسان و شیا و شان	کورکان		کواع
	خیا بان		کرک		غوسیدجان
	کمبراق	کریکرعربان	کونکروغزان	کبک	کذک
	سبقر	پوشنک	سرخس و پشنک	سعوکی	شیدغر
	انجیل	هرات	مدینه هرات	خهرکی	جیر

A very slight knowledge of Persian will show how easily these words may be corrupted in writing and copying. When the word *nehr* is used for canal, the authority is Arabic; when the term *Bulook* is used, the source will be *Toorkee*.

In matters of mistake, regarding the value of the *Abjud* numeration, any common table of latitudes has only to be opened to prove that they are endless.

For instance, in the tables of *Abol Fedae*, regarding *Khorasan*, No. 11, is placed between *Zoozun* of *Kohestan*, and *Khurjurd* of *Herat*. (*Khosh-*

ruo jurd (خشروردر) a place called Khoost of Bulkh, said to be between Indurab and Tokharestan; and it is so placed because the  $\omega$  of the Long. = to  $90^\circ$ , has been read  $\omega = 80$ , and the  $\zeta$  of the Lat. =  $8^\circ$ , has been read  $\zeta = 3^\circ$ ; thus it stands:—

Khoost, Long. 83—47; Lat. 33—20; but should be, I think,

— 93—47; — 38

Even with the correct description in the printed text the errors have not been noticed.

The geographical work known by the name of Ebne Huokul, is said to exist in the library of Leyden, in the original Arabic; Sir William Ouseley has given to the world a translation from a Persian work on geography, which he considers to have been made into this language from the original Arabic of Ebne Huokul; and certainly, if not a direct translation, the identity of the passages would warrant the Persian work being considered as a compilation from the Arabic. No particulars of the author appear known; but Sir William Ouseley considers the work may bear date between A. D. 902 and 968. The notices of Persia (Fars), are so much more complete in detail of districts, rivers, capitals, tribes, families, and even proper names and characters of persons, as to sanction the idea of Ebne Huokul being a native of that province, or perhaps of Arabian Eerak, therefore his accounts of these portions of the east are more to be depended upon. He traces Mavaolnuhr, as a visitor or traveller would do, while his remarks are full, though not complete on the route of Kerman, Seestan and Merve, lying between Fars and Bokhara. This last city he must have visited in the days of Nooh bin Nusr, the 4th of the Samanian dynasty of Bokhara. Tables called Utwal and Urooz, bear the name of Ebne Hookul; but a work called Momalek and Musalek—the name of that translated by Sir W. Ouseley—is by natives attributed to Uhmud bin Abu Yakoob Ulkateb.

Abou Rehan, a native of Beroon in Kharism, spent many years in travel, and was ultimately employed by his king, Mamoon of Kharism, as an agent at the court of Guznee, during the reigns of Muhmood and Masood. He was one of the most subtle and clever men of his age, and passed for a magician; his geographical work is called the Kanoon ul Masoode, and with reference to the place in which it is written should be good authority in matters connected with Afghanistan, at the period from 1000 to 1050 of Christ.

A writer on geography is also constantly quoted as Ebne Sued, of whom little appears known. D'Herbelot adds, that his name was Othman, and that the title of his book was *Ketab olmoccenna*. This author is chiefly known as being an authority of Abool Feda.

The work of Edresee compiled in the year 1154, for Roger, king of Naples, by Aboo Abdallah Mohummud, should be of authority and weight in questions connected with the Mediterranean, Egypt, the coast of Africa, and perhaps the interior of Asia Minor or Syria.

Abool Fedae, Esmael bin Nusr, Prince of Hamah, in Syria, flourishes as a royal author of a work on geography in the Arabic language. He died in the year A. D. 1331; his work is entitled *Tukweem ul Buladan*, and with reference to the country where written, it should have more weight in questions connected with Asia Minor and Syria, than in relation to those at any great distance from his native place.

It is a strange circumstance, and worthy of note, that Kundahar, as a term for a capital, or even district, is not to be traced in the geographical works of common use as connected with the country, to which it is now applied. This fact has created some astonishment; so much so that Professor Wilson is inclined to consider the name of modern origin.

Thus, if we consider the book translated by Sir Wm. Ouseley to be the work of Ebne Huokul, we find not the word Kundahar where it should be looked for, in the direct road from Best on the Helmund, to Guznee; but in the spot now occupied by Kundahar we find Shuhre Rukhuj, being the capital of Arachotia. It may be questioned which is the archetype on these two words, and which the corruption. But we are to bear in mind that this work of Momalek and Mosalek, is not proved to be the book of Ebne Huokul; that a work under this title is attributed to another author, viz. Uhmud bin Abee Yakoob.

In the work of Edresee, in the same situation, between Best and Guznee, we trace this identical route, with a few intermediate stations added; giving Rukhuj and Punjwae as occupying the position of modern Kundahar, set forth in the 7th section of the *third* climate. Hence, here we are disappointed in finding the name of the district, although, as we shall show hereafter, names are given of places close to the old city of Kundahar. This to a casual observer would be almost conclusive, that the city, or its name was of date subsequent to the



work of Edresee. But on a little closer examination what can be traced? Why, in the 8<sup>th</sup> section of the *second* climate we find—

“Candahar est une ville considérable et très peuplée ; Les habitants sont remarquables par la manière dont ils laissent croître leur barbe, qui leur descend jusqu'aux genoux ; et qui est large et très touffue, ce qui a donné lieu à une façon de parler proverbiale ; Leur figure est ronde, ils portent le costume turk Le pays produit du blé, du riz, diverses céréales, des moutons et des bœufs. Ils mangent les moutons morts naturellement, mais jamais de bœufs, comme nous l'avons dit plus haut. De Candahar à Nahravara on compte 5 journées en chariot “Les peuples de Candahar sont souvent en guerre avec ceux de Kaboul” laquelle est une ville indienne voisine du Tokharestan grand et bien bâtie. Ses montagnes produisent du bois d'aloës excellent, et ses environs des noix de coco et des myrobolans de l'espèce qui tire son nom (Kabouli) de celui de cette ville, et qui croît dans les montagnes. “Dans les lieux bas, on sème des bulbes de safran en quantité, et cette substance devient l'objet d'un commerce d'exportation considérable. C'est un objet d'un produit éventuel qui dépend de l'état de l'atmosphère. La ville de Candahar est défendue par une citadelle très forte, située sur un rocher escarpé qui n'est accessible que par un seul chemin elle est habitée par des Musulmans : il y a un quartier dont la population est juive infidèle. Aucun roi ne peut prendre le titre de chah, si ce n'est après avoir été inauguré à Kaboul. En vertu d'une ancienne loi, la prise de possession du pouvoir a lieu dans cette ville, où l'on accourt des pays étrangers de très loin. Dans les terres fertiles du pays de Kaboul on cultive beaucoup d'indigo de qualité supérieure à toute autre, et qui, par ce motif est très renommé et fait l'objet d'un grand commerce. On y fabrique aussi quantité d'étoffes de coton qui s'exportent en Chine, dans le Khorasan et dans le Sind.” Il y a dans les montagnes de Kaboul des mines de fer très connues, le métal est d'une couleur grise marbrée, devient très-tranchant, — — —. This we find dragged into a chapter, section and climate evidently confined to Scinde and India.

Now the town here described was of India ; the inhabitants were *not* Turks, though wearing their dress,—the produce was rice, and the people would not eat beef, and the distances were measured in journeys by carriages,—all circumstances of India ; yet the people were constantly

at war with those of Kabul, a city of Tokharestan, and were at times under the king of this Kabul. Hence these latter circumstances are those of the present Kundahar of Afghanistan, of which at that period the inhabitants were Torks, the produce hardly any rice, beef consumed, while such a thing as a wheel carriage was never heard of in this mountainous country. In fact, a wretched mixture has been made of two descriptions obtained from other authors; one of Kundhar, a city of Baroach, in Guzerat, of which country, the capital, Anhulpoor, was subsequently called Nehrwalah, according to the Ayeen Ukbaree and of which as near the sea coast, the accounts must have been known to the Arabs, and of the description of Kundahar near Kabul of Afghanistan. Thus having disposed of both these places in the 8th section of the *second* climate, Edresee finds himself at a loss when he reaches the correct position of the second in the *third* climate, so blinks the question, and mentions a capital or a city of Arachotia; From Guznee he is forced by propinquity to enter again upon the subject of Kabul, which is done in a hesitating mode; though the circumstances of the coronation again mentioned, prove this town, now introduced in the 3rd, to be identical with that already mentioned in the 2nd climate. This is the great error of all compilations not distinguishing between places under the same name. It is also a very curious fact that in this quotation by Edresee we find the inhabitants of Kabul are mentioned as *Jews*, and this too by an Arabian author, who would be versed in the genealogies of his country.

If we proceed to Aboolfeda we trace the same error of compilation. Rukhuj is given as a district of Segestan, of which a town was Punjwae, on the authority of Ebne Huokul;—and on the authority of the Kanoon, it is attributed to Lat.  $32^{\circ} 50'$ ; Long.  $93^{\circ}$ , in the third climate; while in the table of places in Hind, of which all the rest are called of the latitudes of the twenties, and in the second climate, we find a place designated Weehund, a town of Kundahar, with Lat.  $33^{\circ}$ ; Long.  $94^{\circ} 50'$ , and the third climate, on the borders of the desert of Scinde on the authority of Kanoon; almost identical with the above fixings of Rukhuj by the same author. Ebne Saeed considered it one of the seventeen Alexandrias built by the Macedonian conqueror; The error of Edresee in regard of Nuhrwaluh just mentioned, is also brought forward. I have no doubt but that Weehund, ويهند is a clerical mistake for Punjwae, پنجواي, a town which now exists some 12 miles west of the old city of Kundahar.

In the hope of arriving at some facts, in the matter of the recorded latitudes and longitudes. I tabulated all I could collect of two such celebrated places as Herat and Guznee. The Red book MSS. is so carefully written by the hand of some man versed in the science of figures, that I consider the readings to be correct, all the others being from printed works are doubtful.

<i>Herat.</i>	<i>Latitude.</i>		<i>Longitude.</i>		
	°	'	°	'	
Ayeen Akbaree, ..	34	30	94	20	} 94° 25'
Sadek Esfuhanee,	34	30	94	30	
Utwal, .....	35	0	85	30	} 86 55 7° 30'
Ebne Sued, .....	35	30	87	30	
Red book, a MS.	34	0	87	45	
Major Sanders, ..	34	21' 27	62	07	
<i>Kundahar.</i>					
Ayeen Akbaree, ..	33	0	101	15	} Tungee- } 101 02
Sadek Esfuhanee,	33	30	100	50	
Kanoon, .....	33	20	93	0	} Rukhuj } 92 50-8 12
Red book, .....	33	40	92	40	
Major Anderson, ..	31	36' 10	65	53	
<i>Guznee.</i>					
Ayeen Ukbaree, ..	33	26	104	20	} 103 35
Sadek, .....	33	30	102	50	
Utwal and Kanoon,	33	35	94	20	} 94 22 9° 13'
Red book, .....	33	30	94	25	
Engineers of the army, .....	33	33' 54	68	15	Wyld's Map.
<i>Kabul.</i>					
Ayeen Akbaree, ..	34	30	104	40	} 104 24
Sadek, .....	34	30	104	08	
Utwal, .....	34	30	94	40	} 94 30 9 54
Kanoon, .....	33	45	94	20	
Engineers of the army, .....	34	30' 18	0 69	0	Wyld's Map.

The above table I believe to contain the quantities intended by the respective authorities whence extracted. Now Herat and Guznee have both been emporiums of science and astronomy and astrology,—the former under Arab, Tork and Mogul dynasties,—the latter under the Guzneevid race of Muhmood; and at its capital must have been calculated the Kanoon-e-Masood of Aboo Rehan. Hence, as far as their rules of science and art would carry, we may conclude the position of these two places to be exactly fixed. The latitude of Herat differs

\* Or, the capital of a chief of these parts, Teghe, who flourished in the days of Subuktugeen.

but a few miles from that established by Major Sanders ; while the latitude of Guznee is identical with that ascertained by the Engineers of the army of Kabul ; proving that these Moslem geographers could fix the latitude with precision. In the matter of the longitudes, we may notice that those of the Ayeen and Sadek commence from a first Meridian, distant  $10^{\circ}$  west of that used by the other authorities. Now the difference of longitude between the Peak of Teneriffe,  $16^{\circ} 39'$ , and some of the Capes on the West Coast of Africa, say Cape Spartel,  $5^{\circ} 54'$ , is about  $10^{\circ}$ . Again the differences of longitude stand thus between Herat and Guznee :—

	Long.	Difference.	
Herat Ayeen Tables, . . . . .	$94^{\circ} 20'$		
Guznee Ditto ditto, . . . . .	104 40	10 20	} 9 45
Herat Utwal ditto, . . . . .	85 30		
Guznee Ditto ditto, . . . . .	94 40	9 10	
Herat English ditto, . . . . .	62 07		
Guznee Ditto ditto, . . . . .	68 15	6 08	

And I believe the difference between  $6^{\circ} 8'$  and  $9^{\circ} 45'$  or one-third, may be safely allowed as the error of equation to the equatorial mile for distances estimated by marching or travelling, but also included in it, the windings of roads, ups and downs of mountains, &c.

Kundahar is placed 2 degrees to the north of its correct position ; whence I infer, it is fixed, not by actual observation, but by the estimated bearings and distance of marching between Herat and Guznee. Indeed the inhabitants of Kundahar appear always to have been considered a wild savage race, to be avoided. Until the days of Uhmud Shah Dorranee it was never the capital of an empire. I conceive, if the correct readings can be obtained, that with the equation above noticed for longitude, differences of latitude and longitude, when not large, may both be relied upon ; but the greatest difficulty lies in the obtaining the correct reading of the Abjud numeration.

The following memoral words contain these letters in succession of their value in number, Abjud, Huowuz, Huttee Kulmun Suaful Kurshut, Thukhuj Zuzhugh. Comparing this numerical scale with that of the Greek or any other language, may point to a correspondence between the written characters of the two nations. Both the epsilon and the eta of the Greek correspond with the aspirate of the Persian.



Value.	Persian alphabet.	Greek alphabet.	Hebrew alphabet.
1	ا	α	א
2	ب	β	ב
3	پ	γ	ג
4	د	δ	ד
5	ه	ε	ה
6	و	ς	ו
7	ز	ζ	ז
8	ح	η	ח
9	ط	θ	ט
10	ی	ι	י
20	ک	κ	כ
30	س	λ	ס
40	س	μ	ס
50	س	ν	ס
60	س	ξ	ס
70	س	ο	ס
80	س	π	ס
90	س		ס
100	س	ρ	ס
200	س	σ	ס
300	س	τ	ס
400	س	υ	ס
500	س	φ	ס
600	س	χ	ס
700	س	ψ	ס
800	س	ω	ס
900	س		ס
1000	س		ס

These letters are thus combined :—

33=لپ

38=لح

1345=سمه ατμε

5010=هغی ει

135000=قلهغ ακε

In the Persian the highest number of each division comes first, and the divisions in the same order. A mark below the letter in the Greek indicates the division of thousands.

Now it is evident, that many of these letters are the same in form and depend on their diacritical marks for their correct value. But, alas !

in any but the most careful writing these marks are omitted, and much confusion has resulted. In the common forms of hurried writing, the ذ و ز are undistinguishable :—ج and ح for 3 and 8 are entirely at the mercy of the points. Indeed, unless in a work copied by a scientific arithmetician, it is first necessary to ascertain the probable place of the figure ere this numeration can be used with any chance of success.

Native authors give a few rules—for instance, to ج jeem for 3 ; the tail is never drawn round, and it is thus written (7) to distinguish it from ح hee, for 8 ; viz. 7, 3 ; ح 8,—but copiers never attend to this rule, and in almost every printed table I have examined, I find three and eight used at pleasure. Next it is ordered to distinguish و noon, for 50 ; from ز zee, for 7,—that a twist in front be added to the former, thus ; و, 50, ز, 7. While the yee ی for 10, is usually to be carried to the rear, thus ← 10. How little confidence is to be given to manuscripts copied for sale may thus be supposed.

The rule for determining the latitude is the same as that used by moderns—the application of the declination to the zenith distance ; but with no allowance for parallax or refraction. As regards the longitude we are informed by the Ayeen Akbaree, that it may be settled by watching the difference of local times, at which takes place some natural phenomenon, as an eclipse of the sun or moon ; but how the exact local time of one place was to be transferred to another situation, is not given. I fancy therefore, that this important calculation was rather determined by estimated or even measured distances along high roads.

**MOSLEM HISTORY OF HERAT.**—The first account of the early rise of Herat runs thus,—“That when Tuhmoorus exalted himself as a God before the people, and introduced into the world every species of cruelty, some tribes of Kundahar wandered from Kabul to Ghoor and settled at Oobah. The violation of a virgin led to a disagreement, under which a portion migrated to Koowashan, on the present Malan canal, where at length a lady, called Shumeeruh, of the race of Kueomuruth, became Queen, in the days of Heyatuluh domination over the country. The fort built by her was much improved by a chief called *Khurnoosh*, in the days of Moses, about 1830 years before the Hejree, or some 1200 B. C. Again, in the days of Bahmun, a chief called *Urghanoosh*, enlarged the city of Shumeeruh, and as the inhabitants were now Christians, each bastion was surmounted with a cross!! this

event took place about 360 years before the Hejree, soon after the departure of Christ from the earth.

The second account makes Shumeran to be called after a daughter of Bahmun, a king of Persia. Her name being also Homae chehrazad ; and that Dara bin Dara had commenced the works of Herat, which after his death were completed by Alexander the Great ; but Eshk the Arsak exerted himself to remove every mark of this conqueror, even to changing the turns of the roads under the gates.

The third account gives the honor of the foundation of Herat to a daughter of Zohak, at a period when a Prince called Jooghun, of the race of Kue Kaoos, was settled in Badgheesh.

The fourth and most curious account is as follows :—

Alexander finding his country much distressed by the constant inroads of the *TORKS*, obtained leave from his mother to proceed to the frontier and build the city of Herat, on condition, that he did not remain absent more than one year. During the progress of the work, the people of Kohndez remonstrated against the building of so strong a post. Alexander wrote for the advice of his mother ; she ordered her son to send up to the capital some of the soil from the foundation of the new city, which she in secret placed under the carpet of her council chamber.

Then she assembled her *Roman* councillors who all gave different opinions,—she requested them to retire and to pause over their opinion and to return next day,—during which she removed the earth of her son's new city, from under the carpets. On the following morning the councillors all agreed that it was quite correct and advisable to build the new city. The mother therefore wrote to her son to carry out his own plans and intentions, as the qualities of the soil of Kohndez went to prove its inhabitants were of vacillating disposition and not likely to enforce their opinion, so Herat was built by Alexander.

The fifth account makes Alexander to find in a box an account of the first building of Herat by *Christians*, according to the plan of which he restored the city. The sixth account makes Herat to be founded by Alexander Zowelkornuen mentioned in the Koran. The seventh account is compounded of the former statements, that Seyawosh, Dara and Alexander each built portions of the walls.

Many other versions are given : one Shaikh declaring that the pro-

phet Khezer appeared and told him "the spot on which now stood the bazars of Herat, where the good and bad were contending for the things of this world, was once a sea, and that the fort was based on a rock against which endless ships had been wrecked."

I have known learned men without number throw down this account as utter nonsense, from the apparent anachronisms contained in it. The migration of the Kundahar tribes is recorded by Khondumeer as taking place in the reign of Kobad, during the excesses of the Manichæun fanatics, about A. D. 490. But the appearance of the name Kobad has given a reason for carrying back the account to the ancient Kueanian king, who flourished in the mythological periods of Persian history.

The most curious account is the fourth, and one which forms a basis for most of the other statements, and is a key to much similar Persian and Arabic history.

The fact is, this account is of a far different and very distant place, viz. *Heeruh*, one of the seven cities of Urak, some two Fursukhs from Koofuh. This I hit upon by finding the Kusre Khuwurnuk of Heeruh of Urak, also located by some authors in Herat of Khorasan. The work translated by Sir Wm. Ouseley contains the following:—"Kadseyuh, Heeruh and Khuwurnuk are situated on the skirts of the desert towards the west—the river Euphrates running by them on the east \* \* \* Heeruh is an ancient city and large, but when Cufa was built Heeruh was drained of its inhabitants. Heeruh enjoys a pure air, and is one farsang distant from Cufa."

Now we know that Alexander Severus was for some time employed on this frontier against the Arsakian king, and subsequently against the founder of the Sasanian dynasty—Ardashur. Hence near some older fort or Kohundez, he may have built a new city called Heeruh, or re-embellished an old one of this name. We have it recorded that he was entirely under the authority of his mother Mammæa, without consulting whom he never undertook any enterprize of importance.

Herodian mentions the influence of the mother on the excellent disposition of the son; that he ruled the Roman world for thirteen years, when the Persians crossed the Tigris and commenced to ravage Mesopotamia. A large Roman army was destroyed from the non appearance of the emperor with his division; some attributed this to cowardice,



and others to his being overruled in the affair by Mammæa. This influence of the mother was turned against the son by Maximine, his murderer and successor, who urged on the soldiers "to abandon a wretched woman and that easily dispirited boy who could truckle so tamely to a mother's tyranny."

These coincidences of character will warrant the assumption, that the Alexander mentioned is not the Macedonian conqueror, but the Roman Alexander Severus, and the identifying of Heeruh of Erak with Herat of Khorasan will cover the apparent anachronisms and false statements of the cross on the walls in the days of Urghanoosh; of the inroads of the Torks or Partheans; of the ancient and previous Christian inhabitants; and lastly, of Khojuh Khezer's assertion that the city was on a rock of the waters; which might be the case previous to any change in the course of the Euphrates. The first statement has I suspect an eastern or Indian origin, having reference to a migration westward of the Gundhara tribes of Buddhist Hindoos from the banks of the Indus, and from them may the district of Arachotia have assumed the name of Kundahar.

Perhaps some Latin author of the period may yet exist, whence the Arabians may have translated their accounts of Heeruh, and thus have furnished them to the Persian makers of histories; attention will I suspect trace many similar mistakes, and alas! dishearten readers from placing much faith in Persian or even Arabian histories of periods earlier than the introduction of the creed of Mohummud.

The Nestorians make Herat to have been the seat of a Metropolitan as early as A. D. 411. That it was destroyed by Othman; at which period there existed a celebrated fire temple called "Shurshuk."

The term Herat, in its largest extent, as the capital of any ruling dynasty, may have been often so applied, as to include many distant places, but in its proper restricted sense, it is a very small valley, bounded by hills and intersected by a stream called the *Huree rood*; the valley is about 80 miles in length, from Obuh to Ghorian and of various breadth,—being about 20 miles in the longitude of the city. This area constitutes Herat proper, but in the common acceptation of the term, are also included many immediate dependencies bearing distinct names. This area is well watered; on its northern side by kareez, from the hills, and on its southern side by the canals taking

off from the river, watering the cultivation and running to the principal towns. The length of some of these canals proves the ancient wealth of the district. The Malan canal, to the north of which is situated the city, is said once to have been carried round the corner of the southern range, and when in good repair, to have discharged its superfluous water into the Furuh rood. The main stream of the Huree rood early in summer, when full by the melting of the snow, passes beyond Ghorian, and always reaches a small village called Surrukhs, east of Ghorian, and hence has arisen the idea that the waters of the Herat river ran to the distant large districts of *Surrukhs* near Merve.

When Herat was the capital of Khorasan and residence of a powerful prince, the whole of the above area was covered with most beautiful gardens, orchards and farms surrounding the various forts of the different chiefs and courtiers. Previous to the late frequent visits of the armies of Persia and of Kabul, the spot is described in all its beauty and fertility, by the most glowing terms of the writers, whether of prose or poetry. It truly deserved its title of the "garden of Khorasan." The twelve canals passing by the various towns and villages have each a name, as have also the many collections of houses here and there built on the banks of the streams. In the early Arabian conquests, a collection of such villages and hamlets obtained the name of the canal on which situated, as the Rood Unjeel, but after the settlement of the Moguls, the word Bolook—the Torkee term for a spring—was substituted, and the same collection is now called the Bolooke Unjeel.

Until the days of the Temoorian prince Shah-rookh Mirza, Herat was considered more in the light of a provincial town, than of a royal residence,—it was not the chief capital of any Arsakian or Sasanian king,—nor the residence of any of the Arabian Califs,—but considered rather as a strong fortified frontier position; on the Mogul invasion it rose to greater height; and under Shah Rookh the city reached its present form, and perhaps its highest point of celebrity as to beauty and embellishment, though not perhaps of extent. The walls then had five gates,—the Urak, to the west; the Khoosh to the east; the Feeroozabad to the south,—while to the north were two,—the Mulek and Kutubchak;—the foundation of the walls were considered 60 zurua broad; the walls themselves 30 zurua in height,—and each side 2000 zurua in length; while the external circuit was estimated at about one fursukh.

The N. E. corner bastion was called Uleusud,—the N. W. corner the Ful Khanah; the S. W. the Khakestur and the S. E. the Khoojuh Abdal Misree. The separate citadel, originally built by Mulek Fuhroldeen Kord in a temporary form, was reconstructed of great strength and solidity by Shah rookh Mirza in 818 H.

In the Ebne Huokul, translated by Sir W. Ouseley, Herat, as the seat of a governor from the Khalif of Bokhara, is not described as a place of any very great beauty, fame or importance; the only building mentioned being a celebrated mosque; as I have before proved, the canals then bore nearly the identical names of the present day, and with a little trouble I believe almost every proper name of that work could be traced in a place of modern times. Edresee adds—"that ere Herat rose to its present importance, a town called Khorasanabad, 9 miles west in the direction of Pooshung, was in greater estimation."

Ebne Huokul mentions a mountain producing neither grass or wood, or any thing but stones, which serve for mill stones. "Here is a place inhabited called *Sekuh*, with a temple or Church of Christians." This is no doubt a portion of the mistaking of Herat for Heeruh, on the Euphrates, where many hermits would have selected barren spots of the sort described for their earthly place of mortifying the flesh.

The moment that the river fairly emerges from the mountains at Oobuh, its waters are by dams forced into various canals, which running parallel to the stream, by degrees diverge from it and irrigate the entire valley, which thus in times of prosperity form one extended mass of gardens, vineyards, orchards and pleasure grounds.

Many of these delightful spots are by their fruit known and celebrated over all Persia. When Herat was the capital and emporium of commerce, and had large funds to employ on agriculture, and ample armies to defend its possessions, these gardens flourished; but when commerce failed by the introduction of new routes and sea voyages, and the country was overrun by hostile armies, the water courses were destroyed, the trees cut down for military purposes or fuel—and the face of the valley reduced to its original feature of a stony upland. Such destruction would be but the work of a season, but the restoration one of many years.

The various divisions with their canals are thus recorded:—

Guzaruh or Malan, to the South of the river and city; Sultan

Sunjer built a grand bridge over the Herat river, on the road to this district, in the year H. 505.

Unjeel. In which is included the city of Herat.

Ulunjan. North of the river, but South of the city ; 5 fursukhs in length from East to West.

Ghoorwan and Pastan. North of the river ; East of the city.

Tooran and Tooneyan. North of the river ; East of the city.

Kheyaban. North of river and city ; near to the Unjeel district, all the dead of the city lie buried in various portions of this division—which is a large field of graves.

Subkur. North of river ; East of city.

Purwanuh and Huwadashtuk. North of city. In it is situated the hill Called Kazur Gah, celebrated for the tomb of Abdullah Ansaree, and for the Tughoor Robat.

Kumburak. South of river.

Oodan and Teerzun. South of river.

Such are the immediate districts round the city whose taxes and grain revenue are included in the collections of the city.

The more distant divisions are :—

1st. The *Heerat rood* ; that is, the Herat river while confined into a more narrow valley than after passing Oobuh ; the altitude and consequently the cold and frost are much greater, hence we find fruits of this kind of climate celebrated as walnuts, apples, almonds, &c. This division also contains many minor districts, as Oobuh ; Kuwashan ; Pooran ; Duk ; Mulmuz ; Feerooz-Koh, the ancient capital of the Princes of Ghoor ; Cheshtee, the burial ground of the celebrated Saint Kuajuh Moodood Cheshtee. A hot spring of some celebrity also flows from one of its hills ; these also contain quarries of white marble, while Shafolan is celebrated for its mines of iron and lead, and a hot spring, which cures many diseases and is in consequence much resorted to by the sick and infirm ; this district of *Herat rood* lies between Herat and Ghoor. The river of Herat rises, according to Arthur Conolly about 10 miles West of Yukaulung, at an elevation of 9,500 feet, passing Deh Zungee, Duolutyar, Badgah of Chukcheran the fort of a leading chief of the Feeroozkohees. After some miles more through this almost independant Emak, the river and its boundary lands constitutes the district of Herat, called *Herat rood*. The country North of this



line, circling by Muemonah towards the country of Balkh, is known as Ghorjestan.

The division to the North-East of Herat is Khorukh, once a most fertile and populous spot; it lies some 50 or 60 miles to the east of the still more celebrated canton of Badgheesh.

This district is about 160 miles long by 120 broad, situated to the North of Herat, being composed of both high mountains and correspondingly low vallies; it enjoys a great diversity of climate, producing both cattle, corn, fruit and timber; in particular a tree called Uroos, which is seldom destroyed by rot or insects; 70,000 Khurwars of grain were with no difficulty collected from this division in the days of Sultan Husuen Bahadoor Khan, as the grain revenue. Robate Khoosh is considered on the boundary between Herat and Badgheesh. A river of some size, called the Purkhud, is mentioned in Badgheesh.

Three circars did compose this district—Lungur Umeer Gheeyas, Chuhel Dokhteran and Jurlan.

The first owes its name to a holy Seyud of the days of Timoor; the second is watered by a rapid stream, and the third contains the wonderful fort of Nurutoo, situated on the summit of a bare rock, with only one narrow winding road to the gate; than it is no stronger fort in Khorasan. The climate is so cold that flowers appear here only in the autumn of the lower altitudes. Tukhte Mulek is a small district surrounded with mountains, which during even summer are capped with snow.

Direct west of Herat, between it and Ghorian, lies Pooshung, with its robat and musjed, the former being one of bad omen. Near the hills round this robat are marks of feet imprinted on the stones, said to be those of the prophet Abraham; while all the stones are in the form of birds and animals, being petrifications; there is also, a spring of aperiient water much visited by the infirm. Koosooyah is of this district, celebrated for a defeat given to the Moghuls in the year H. 695.

Koosooyuh is the *Kouserî* of Edresee and Sir Wm. Ouseley's work.

Felbundan is a large plain entirely devoted to the cultivation of melons of the largest size; to the eye of the stranger these white, round immense melons scattered over the plains appear like sheep lying down to repose.

South of *Herat road*, East and North of Furah, reaching to and at

times including Zumeen deewar, lies an unexplored but often mentioned country, Ghoor—described as a series of strong hills and narrow vallies, giving rise to the several rivers running into the lake of Seestan ; it was once the stronghold of a warlike nation, which conquering eastward became celebrated as rulers of Guznee. The chiefs claim descent from Zoohak, others again contend they are descended from the lost tribes of Israel, but allow that they embraced Eslamism at a very early date in the days of Ulee ; whose firman they possessed till the days of Buhram Shah, son of Sultan Musood.

The fort of Kheesar is celebrated for its strength, and for its resistance to the armies of Chungeez Khan ; this king granted the district to the chief in possession, Roknoldeen, who thus became the founder of the Kord dynasty in Herat ; and a firm ally of the Moghuls.

The following streams flow South from Ghoor : The Moosa Kula Khashnahr, Furah and Guz, besides many famous canals, as the Ebraheemjoece.

Ahunguran, Khurshut, and Urmaj are mentioned as forts of this country.

Below the range of hills bounding the valley of Herat to the South, lies a large district usually considered a dependency of the city ; it is called Esfezar, and is watered by a river of the same name. On the banks of the stream are the ruins of what was once a fort of the greatest strength of position and art, called Mozuffer Koh, and built by Uluptugeen.

The fort was situated on the very top of a rock, the sides impervious to horsemen, infantry, or almost even birds ; there was one winding entrance towards the river, the walls were nearly 30 feet broad ; so that eight horsemen could ride abreast ; a stream of water also flowed from the top of the rock. Another strong fort was Sharestan, on the other side of the river, also celebrated for its strength, and said to have been built by Balkuees.

Budrabad and Furumgan were also strong castles, now in ruins.

The two rivers of Udruskeen and Guz unite in this district, near the town of Subzwar. This word Esfezar is considered a play on the term Sepurzur ; and may be the position of the country to which one of the silver shielded Regiments of Alexander was banished by his successor for mutinous conduct. Declining southward in altitude, this

district is extremely fruitful, its pears are celebrated, as also the small unab, which are as delicate as grapes. The fort was once of great strength. One district, Zawul, was celebrated for its kareez, the waters of some being so strong and ample as to turn mills.

Ubkal or Ookul to the South, and Junburan to the East, are districts ; from the latter the road leads to Duolutabad.

Furumgan is mentioned as containing the beautiful carved pulpit of some early saint, which was destroyed by the barbarous Beloochees. This place had the reputation of being older than even Herat.

To the South, on the Udruskun, were two small forts opposite each other, called Dokhtur and Pesur.

The modern town of Subzwar is a mean place, consisting of a collection of mud huts.

Amply watered by the several streams issuing from the mountains, this district was once considered the granary of Herat, but the absence of security and good government has almost destroyed its prospects and reduced it, with all the surrounding country, to a very barren, ill-cultivated, inhospitable tract. The present population is Tajeek and Persian—the dominant tribe Afghans, under a Sirdar from Herat.

South of Subzwar lies the country called *Furah*, sometimes considered independent,—indeed once said to have been the capital of a mighty kingdom and the residence of the Persian hero Rostum. It was subsequently a district of Seestan, but is now claimed as an outwork of Herat.

The chiefs of *Furah* have always asserted for themselves a very illustrious descent, and have often struggled to obtain their hereditary freedom ; opposing a foreign yoke. One Governor from Herat is mentioned as finding them so troublesome that he invited eighteen chiefs to a feast, and murdered the whole ; only one escaping.

Near the town is a hill called Burunduk or Beechuk ; this contains a natural arch and cavity, from which water constantly drops. This phenomenon is by the vulgar connected with the divine author of all things, and considered a mysterious proof of his hidden power, hence it has become a place of pilgrimage and of votive offerings ; if the water increases in its droppings on the head of the devotee it is a sign of success to his prayer. The place is called Take-sungee and Koh-hejuran.

Anar-duruh is a large district of this country, celebrated for its pomegranates. The forts of Kah and Ook lie south of Furah. The former west of the river ; Ook is the name of a sub-division lying between Furah and Seestan ; a range of hills in it contains one of those singular slopes of sand called Reg-ruwan, to roll down which is considered a very meritorious action. On this range is said to exist the ruins of Tukhte Rostum, a stronghold of this warrior. Modern Furah is a place of no strength and nearly deserted.

The river of Furah is a large stream, about 30 miles above the city, in July it was 35 yards broad,  $2\frac{1}{4}$  feet deep, running  $1\frac{1}{4}$  miles in the hour, and just fordable, but during torrents often detained caravans.

Furah extends East to the river of Khash, South to Joeen, and North to Aseyabad. Except on the banks of the rivers the face of the country is composed of large flat hard dushts separated by bleak ranges of hills.

The aborigines are Tajeeks and Persians ; the dominant tribe Afghans, under a prince or chief from Herat.

To the South of Furah lies Seestan or Seegestan, sometimes called Nemrooz. The earlier inhabitants were called Sukan and Sukzee ; which last some consider to have been arabized into Sug or Suj, and hence Seejeestan. A tribe was also known as Sunjuree.

Lash and Joween are two strong forts on the frontier ; between them flows the river of Furah. We trace Joween in the work of Sir Wm. Ouseley, and in Edresee, and from it have a distinct distance to Zurung, the ancient capital ; viz. to Peer or Dostar, one march ; to Gurgoonah, (12 Arabian miles,) and to the capital 9 miles, more ; say a distance of 44 English miles. Ebne Suede has recorded Zurung as 20 miles to the north of the Helmund ; These forts are constantly in the mouths of moderns as places of great strength ; Captain E. Conolly found the former a mere castle on a cliff, but the latter a place of more strength, and capable of resisting any eastern armies ; as it had often done those of Herat.

The Furah river flows into the lake or Zuruh of Seestan, an expanse of low marshy land intersected by bodies of water of various depth. The lake is in books represented as nearly 100 miles in length by the same in breadth ; the exposed lands are culturable, the water swarms with fish, and the reeds and jungle afford cover to endless hogs and wild fowl. The down and feathers of the birds forms a large article of



export. From the number of canals the land was formerly fruitful and valuable; one author says, a kulbuh would in his day sell for 1000 *Kubkee* denars. By the account of natives of the present day the lake is not above 30 miles in circuit.

We have no very good accounts of the country; Captain Christie passed through it in 1810, Captain E. Conolly made a rough survey of the road, while a gentleman of the name of Forbes was murdered in the attempt to reach Kundahar from Persia by the Seestan route. According to histories the ancient capital was called Zurunj, situated in Lat.  $30^{\circ} 30'$ , and distant 90 Arabian, or 118 English miles from Ghereesh, the ferry on the Helmund. I think its position may be fixed with some precision on these data, and will be found to correspond with the ruins of Zero, No. 40 of Captain E. Conolly's map.

A fort called Rostum was situated near the lake; while a stronghold named *Husne Tak*, is mentioned having three separate circumsolutions of walls; between the 1st and 2nd were the fields and cultivation, between the 2nd and 3rd were the houses of the people, and within the third was supposed to be the prison, where criminals were starved; one author states he had seen a house containing 4000 skulls of human beings.

Zurunj certainly existed during the Alexandrian expedition towards India, and is mentioned in the early histories of Moslem conquests; it was also the capital during the supremacy of the Safar dynasty of Seestan, and must have enjoyed great wealth and prosperity, as the centre of the large dominion which included Fars, Kirman and Khorasan.

Tak was destroyed by Muhmood of Guznee, who then took the name of Soltan: and this capture might account for the abovementioned heads in the inner fort. But there exist several places of this name.

Without minute inspection it is most difficult to settle such locations. Sukwuh was mentioned to me as the capital, and I suspect occupies a position south of the ancient Zurunj, being, I conclude, the city near Koh-e-Khuajah, and identical with Tak. It is the residence of Muhammad Reza Khan Seestaneh, who considers himself descended from the ancient Keenian kings; the city is said to be half as large as Kundahar, and to be 10 miles from the river Helmund. A place called Rukhuj was mentioned as a very ancient ruin where are yet dug up old coins. Zal is the position of an old fort on the river: Zuenoon, or Juenoon; near the modern fort of Alum Khan is the point where the Khash river

joins the Helmund, while Mean-rodee or Roodbar is the strip between these two rivers constituting the base of the district of Gurmsael. Julalabad is a collection of hamlets, the property of Reza Khan. Shuhruk is called the town of Mehdee Khan Sustanee.

I have no doubt, that in former times when the whole of this country in its largest extent, of the space between Kundahar, Kirman and Herat, was subjected to a very powerful dynasty; life and property safe; and the reward of labour secure; that the whole face of the country was irrigated by canals taking off from all the rivers; but since these have been destroyed, the body of water reaching the lake is much augmented and hence its limits so extended as to have altered entirely the face of the country.

The country contains many natural curiosities, as burning hills, pits of sal-ammoniac, veins of sulphur, and beds of saltpetre; the production of this last mineral made the country valuable. Nader Shah made the possession of it a subject of boast to the Porte, on this account. Peer Kisree is celebrated for its salt and asafetida. The following is an attempt to reconcile several published routes.

Edresee.	Sir Wm. Ouseley's translation.	Capt. Conolly's map.	Common report.	Capt. Conolly's map.
Joween, .... 1 j.	Peer, .... 1 j.	Goorgooree, No. 48.	Joween, ..... Shaitanuk, and Bunjar, .. {	Bunjar, .... 41. Shyban, .... 42.
Dostar, .. 12m.	Kerkoonuh 4 f.	Ruins of Zero, No. 40.	Dushtuk, ..... Sukwah, .. ...	A town of Shakorhis. Sekoha, .... 29.
Kurkooyuh, ...	Zurung, .. 3 f.			

Sharuk is the district marked Shakorhis by Captain Conolly.

The ancient road to India is thus given:—

Sir Wm. Ouseley.	Edresee.	Capt. Conolly's map.	Common report.	Miles.	
Zurunj, .....	Zurunj, ....	..	Sukwah, .....		
Rusook, .....	Zunoon, 1 j.	..	Borj Ulum Khan, ..... Ebraheem Bulloch.	12	
Shuroor, .. 1 j.	Surooroon, 1 j.	Chuknasoor....	Chugnasoor, Kuda, .....	24	
Hurooree, *. 1 j.	Hurooree, 1 j.	Hurreeree, ....			
Dehuk, .... 1 j.	Dehuk, .. 1 j.	..	Dehuk, .....	12	Of Khash?
Abshoor, .. 1 j.	Abshoor, .. 1.	..	Abeshoor, ....	12	Tulkhab?
Hustan, .... 1 j.	Kurooreen, 1.	..	..		
Abdallah, .. 1 j.	Huftchean, 1 j.	..	Huft chah, ....	24	
Best, .... 1 j.	Abdallah, 1 j.	..	..		
	Best, .....	..	Best, .....	12	

\* Crossing the Khash road.

## APPENDIX.

*Notes by Mr. JOHANNES AVDALL, on the extracts proposed from the work of Moses Khorenensis..*

Moses Khorenensis (Մովսէս Խորենացի) an Armenian historian, rhetorician and bibliographer of great repute, flourished in Armenia in the middle of the fifth century. He was well versed in Syrian and Persian languages. He went to Athens and zealously applied himself to the study of the works of Grecian writers and philosophers. His name is well known to the philologers and antiquarians of Europe, by the publication of the text and a Latin translation of his history and geography, by the two brothers, William and George Whiston in 1736. The learned linguist and orientalist, P. E. Le Vaillant De Florival, professor of the Armenian language at the Royal Academy of Paris, has lately presented the literary world with a French translation of the history of Moses of Khorene, which was published at Venice in 1841, together with the text. Although the geography appended to, and published with the history of Moses Khorenensis by the two Whistons is attributed by some writers to another author, yet the genuineness of its antiquity cannot in my opinion be at all questioned.

I have added the original Armenian to Major Anderson's list. As much of his attempts go to prove the great confusion arising from the mistakes of proper names, I also subjoin the same list from a very correct edition of Moses Khorenensis, as printed at Venice in 1843. Many of the names are different, and several places omitted.

From the preface to this recent edition it appears that the veteran Mechitharistic Society of Venice have experienced no small difficulty in procuring correct manuscript copies of the geography of this ancient Armenian author. Of this they possessed only five in their extensive library. All of them were, however, without the least mention of the dates and places in which they were respectively transcribed, and four were altogether incomplete. After incessant inquiries they at last succeeded in obtaining a beautifully written and most correct and complete manuscript copy of the work from the library of the convent of Etchmiatchin in Armenia, (Գրատան Սրբոյն Էջմիածնի) and thus they were enabled to publish in 1843 a revised and improved edition of the complete works of Moses Khorenensis. A full Catalogue of this library, of

venerable antiquity, comprising 121 pages, was published at St. Petersburg in 1840, by that distinguished and elegant orientalist and Armenian scholar, M. Brosset, who undertook and completed the work under the auspices of his Imperial Majesty the Emperor of Russia. (Vide Journal of the Asiatic Society of Bengal, No. CXXV., old series, page 415—16.)

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*Fursukh* is also an Armenian word, *փարսախ*, or *փարսանք*, or *խրսախ* (*Pharasanga, Latin*); (*φαρασαγγης, Greek*) signifies a distance of three miles or a league.

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Major Anderson has certainly taken a great deal of pains in consulting several Arabic writers. It would undoubtedly be very desirable to give the dates in which these writers did respectively flourish. There is no knowing, for instance, in what year Hamdallah Kuznevee wrote his book, or in what century did he flourish.

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A somewhat similar story of the fabulous qualities of the soil of the country is mentioned in the history of Armenia, in connection with the circumstances of the imprisonment of the Armenian king Arsaces by the Persian king Sapor. (See Avdall's paper, Journal Asiatic Society, Vol. VI. page 81.)

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It is not only customary, but a very common practice with the Armenian nation to indicate the respective value of numbers by a numerical scale of the alphabet of their language; *ա*, for instance is 1, *բ*, 2, *գ*, 3, *դ*, 4, *ե* 5, *զ*, 6, *է*, 7, *ը*, 8, *թ*, 9, *ժ*, 10, and so on. The numerical scale of Major Anderson's valuable paper will, perhaps, be deemed more interesting by the addition of another column, exhibiting the characters of the Armenian alphabet, correspondent in their numerical value with those of the other three languages alluded to in the paper. The following is a hurried specimen:—



<i>Value.</i>	<i>Armenian Alphabet.</i>	<i>Value.</i>	<i>Armenian Alphabet.</i>
1	ա	100	Ճ
2	բ	200	Ժ
3	գ	300	Յ
4	դ	400	Ն
5	ե	500	Հ
6	զ	600	Ռ
7	է	700	Ն
8	ը	800	Պ
9	թ	900	Ղ
10	ժ	1000	Ր
20	Ի	2000	Ս
30	Լ	3000	Վ
40	Խ	4000	Մ
50	Ծ	5000	Բ
60	Կ	6000	Յ
70	Ն	7000	Լ
80	Ճ	8000	Փ
90	Ղ	9000	Ք

*From the edition of the two Whistons, printed in London in 1736.*

Persia is called by Moses Khorenensis “Chusti-Nemrozia,” touching the eastern border of Khuzastan, and the confines of Media, containing twenty provinces.

<i>Armenian.</i>	<i>Whiston's reading. Identifications or approximations.</i>	
Պարսք,	Persia.	Persia.
Ասպահան,	Aspahana.	Ispahan.
Մէշուն	Mesuna.	Mazunderan.
Հակար,	Hacara.	
Պանայիտ,	Panaetia.	
Կրման,	Cermana.	Kerman.
Կուրան	Curana.	Kharan.
Մակուրան,	Macurana.	Makaran.
Միդ,	Senda.	Scinde, lower.

*Armenian.**Whiston's reading. Identifications or approximations.*

Հինդ,	Henda.	Hind ; round Sir-Hind.
Մրան,	Merana.	Mehran ; banks of the Indus, upper Scinde.
Պետվաշտ,	Petvastania.	Punjabistan, the Punjab.
Սագաստան,	Segastania.	Sejestan.
Ապլաստան,	Aplastania.	Afghanistan.
Դեր,	Dera.	Delum, in the Persian alphabet.
Մել,	Mela.	Malia.
Մահիկ,	Mahica.	Mahie, Cambay.
Ման,	Mauna.	Mandavie, a place of considerable trade.
Խոջեհրաստան,	Chozerhastania.	Khazeristan.
Պալհ,	Palha.	Bulharee, country of the
Եբուհ,	Ebuha.	
Ռեսիր պարհասան,	Rhesira Parhasania.	Producing the best pearls, Bahrien,

Aria is called by the above writer, Chusti-Chorasanian, lying between Media, Persia, the Caspian and India.

Կոմ,	Comsia.	Comis.
Ղարկան,	Hyrkania.	Goorgan, Hoorkan.
Ապրշահ,	Apersaria.	Abewurd ?
Մրում,	Meruma.	Merve.
Արուաստ,	Arovastia.	Arachotia ? Hureeswatia ? Kandahar ?
Հրեկատեշան,	Rheucatesania.	Kho Kakusus, Kabul ?
Նստիմանակ,	Nestimanaca.	
Բեշն,	Beznya.	Boozjan, near Jam ?
Սաղկան,	Salcania.	Talkan.
Դովկան,	Docania.	Damghan ?
Անապալ,	Anapalia.	
Հրում,	Heruma.	Huree ; Herat.
Ջամբիլ րոս,	Zambyrus.	Subzwar ?
Նախեր,	Naxeria.	Neeshapoor.

Armenian.                      Whiston's reading.      Identifications or approxi-  
mations.

Դէին,	Dezina.	Zoozen.
Աւազակ,	Avazacia.	
Վարջան,	Varzania.	Beerjun ?
Մանսան,	Mansania.	Muzeenan ?
Զաքստան,	Zaxtana.	Kohestan.
Բահլ որք	Bahlia, quae et Par-	Balkh.
Են Պարթևք,	thia.	
Դոմատ,	Domatia.	Dumadutha ; Dumadoot ; or Deemut of Dumawund.
Լարիմանակ,	Larimanacia.	
Շիրի,	Siria.	Saree ?
Բարիկան,	Baricania.	
Դոմբոն,	Dobonia.	

Scythia (Սկիթիա in Armenian) is called Apachtaria (Ապախտարք) Bactria or Thurchia, extending from the river Ethil (Volga) to the Emavon (Եմաւոն) or Hemalaya mountains (անդր ձգի մինչև ցճենս:) even unto Zenia (China.) Emavon (Եմաւոն) is the loftiest and longest of all mountains. Scythia is inhabited by forty-four nations, among them the Sogii (Սոգիք) Thookharii (Թուխարիք) Hephthalii (Հեփթաղք) and several other barbarous races and tribes. The Sogii are famous for their wealth and love of commerce, and inhabit the country lying between Thurcastania (Թուրքաստան) and Aria (արեաց աշխարհին:) The Sogii are perhaps the Sakæ.

*From the Venice edition of 1843.*

Persia is called by Moses Khorenensis, Chusti-Nemrozia, touching the eastern border of Khuzastan and the confines of Media, containing twenty provinces.

Armenian.                      Avdall's reading.      Identifications or approxi-  
mations.

Պարսք,	Persia.
Ասպահան,	Ispahan.
Մէշուն,	Meshun.
Հակար,	Hakar.
Անայիդ,	Anayid.

*Armenian.*                      *Ardall's Reading.*                      *Identifications or approximations.*

Կրման,	Kerman.	
Կուրան,	Kúran.	
Մակուրան,	Makúran.	
Սենդ,	Send.	
Մերան,	Méran.	Hend, omitted.
Պետկտշտ,	Petwasht.	
Սագաստան,	Ságástán.	
Ապլաստան,	Aplástán.	
Գեր,	Gher.	Ghor.
Մեղ,	Mégh.	
Մահիկ,	Mahik.	
Մաւուն,	Mawún.	
Խոճէհրաստան,	Kocheristán.	Cutch or Kedge.
Պալ,	Palh.	

Ebuha omitted.

Ռէշիր 'ի Պահրսան      Reshír, in the city  
 քաղաք                      of Páhrsán.

Aria is called by the above writer Chusti-Chorasanía, lying between Media, Persia, the Caspian and India,

Կոշմ,	Kóshm.	
Վրկան,	Vírkán.	Workan, Hoorkan, Goorgan.
Ապրշահր,	Aprsháhr.	
Մերում,	Merúm.	
Արւաստհրէ,	Arwásthrew.	
Կատէշան,	Kátéshán.	
Նմանիմակ,	Nemánímák.	
Բիյն,	Bíjín.	
Սահկան,	Sághkán.	
Գոզկան,	Gózkán.	
Անապլահ,	Anápláh.	
Հիրում,	Hirúm.	
Զամ,	Zám.	
Պերոզ,	Peróz.	
Նահչեր,	Nákhcher.	
Դզինուաշակ,	Dezinwázák.	



Armenian.

Ardall's Reading.

Identifications or approxi-  
mations.

Վարջան,

Várján.

Մանշան,

Mánshán.

Ջակեստան,

Jákestán.

Բահլ, ի. ե. Պար-

Bahl, i. e. Parthia.

Թև. ք.

Գովմատ,

Góvmát.

Վարիմանակ,

Várimánák.

Շիրի,

Shírí.

Բարիկան,

Barikán.

Դովբոն.

Dóvbón.

*Note on the transport of coal from the pits at Sonadeh to Bombay, by the Nerbudda.*—By R. N. C. HAMILTON, Esq. Resident at Indore.

No. 494 of 1849.

*From R. THORNTON, Esq., to the Secretary Asiatic Society, Calcutta.*

*Dated Agra, the 1st May, 1849.*

*General Department, N. W. P.*

SIR,—In continuation of the letter addressed to you from this Department under date the 1st February last, I am directed to forward, for submission to the Asiatic Society, a copy of a note by Mr. R. N. C. Hamilton, Resident at Indore, on the transport of coal from the Pits at Sonadeh to Bombay, by the Nerbudda.

2nd. The Lieutenant-Governor observes that the above note is by far the best and most useful narrative of the experimental journies, which has been compiled. The Society will, of course, decide whether it is worth their while to publish more on the subject.

I have the honor to be, Sir,

Your most obedient servant,

R. THORNTON,

*Assistant Secretary to the Government N. W. P.*

*Agra, the 1st May, 1849.*

Government having determined that the coal fields in the valley of the Nerbudda should be examined and an attempt made to convey the coal from the pits by the Nerbudda to Bombay, at the suggestion of Mr. R. N. C. Hamilton, the Resident at Indore, Mr. A. Johnstone, of the Steam Factory Establishment, was deputed from Bombay, to join Mr. Hamilton at Sindwah Ghát, on the 15th of January 1848.

Having reached the coal fields at Sonadeh, between Hossingabad and Baitool, the bed of the Bora-nuddee was carefully examined; coal was to be seen in both banks, but especially in the left, in which a place having been selected, the sand being cleared, the coal seam was exposed, situate in sandstone between two layers of shale.

The upper sandstone was 30 feet thick to the level of the surface of the country, coarse-grained and soft; next four inches of shale, then the coal seam 19 inches, and again shale 4 inches, hard and firm; then sandstone close-grained and difficult. The angle of the seam was  $7\frac{1}{2}$  N. by E., and from the appearance of the country, which formed a basin surrounded by hills, there is every probability that the bed was as extensive, and would prove plentiful.

Excavation from the bank was immediately commenced, and about 500 maunds having been raised, arrangements were made to send it to the Nerbudda.

Sonadeh to Hossingabad is about 40 miles on the road to Baitool, but the Nerbudda between Hossingabad and the Dharee falls was found by Lieut. Keatinge to be quite impracticable for laden boats.

Captain Fenwick left the Sonadeh pits on the 9th March with the coal laden on Bunjarah bullocks, and arrived at the Dharee falls of the Nerbudda on the 25th—the distance being about 100 miles.

Each bullock carried about  $1\frac{1}{2}$  maund, or 1 cwt.; they however, requiring to be daily laden and unladen, are not suitable for the transport of coal, which is much broken and injured by the manner in which the bags are turned over and let fall, when unladen; carts can travel by the route, and would take from seven to eight days to reach Dharee.

The cost of bullock carriage for grain is 5 Nagpore rupees per 100 maunds, for 100 miles.

To Dharee may be considered the first division of the trip, and here should be a main depôt, in which coal may be stored during the dry season.

At Dharee the coal was shipped, Captain Fenwick started on the 5th of April in a small boat with three men and reached Mundlaisir on the 9th; the coal came down in separate batches on boats of various sizes, the largest carrying  $2\frac{1}{2}$  manees, equal to 30 Bengal maunds. The whole of the coal, about 400 maunds, reached the Sahesurdarrah barrier and falls, below Mundlaisir, the first serious obstacle, on the 14th, having been 8 whole hours in transit.

The following remarks explain the nature of the navigation. After leaving Dharee the stream for a mile is narrow and confined between high perpendicular rocks, when the river is very full whirlpools are formed, but at this season the water was shallow. From Dharee to Sillana, about  $9\frac{3}{4}$  miles, no particular difficulty was met with; from Sillana to Alliagan, about  $12\frac{1}{2}$  miles, two difficult channels were encountered at Bhyroopuran, and at Bhaleran-tur (tur denotes rapids and shallows) through which the laden boats were passed with much labour; from Alliagan to Murdana Ghát, about  $7\frac{3}{4}$  miles, several bad places occur, the worst being Surkurree-tur; from Murdana Ghát to Mundlaisir, 12 miles, the whole way is obstructed by rocks, the water in several places very shallow, but the navigation not particularly dangerous; from Mundlaisir to the top of the Sahesurdarrah falls,  $4\frac{1}{2}$  miles, the river is quite clear and deep. The falls and rapids at Sahesurdarrah are impracticable for laden boats; empty ones are let down with considerable difficulty, with the help of ropes and bamboo poles.

It was necessary to take the coal over the rocks for about 600 yards in bags on men's shoulders, and re-ship it at the bottom of the rapids.

This may be termed the second division of the trip, and here there should be a second store or depôt on the high bank, which affords a favorable site.

On the 16th April Captain Fenwick left Sahesurdarrah with a fleet of 15 boats, the coal being distributed among them according to their sizes,—30 maunds was the largest cargo.

Between Sahesurdarrah and Akbarpore\* (5 miles) the chief obstacle met with was at Manawapat-tur; the boats were half emptied and eased down the rapids with ropes, the villagers readily assisting and holding on the ropes. The coal was carried over the rocks by the boatmen.

\* The ferry of the Agra and Bombay road.

From Akbarpore to Kuthora, about  $8\frac{1}{2}$  miles, the water was generally shallow, and at the rapid below Akbarpore, the boats were let down, as before with ropes made fast to the stern. At Bhownosur-tur, the channel was not more than 8 feet wide between bad rocks.

From Kautora to Kirmee, about  $12\frac{1}{2}$  miles, and on the Chikuldah, 15 miles passage Sotabonda at 6 miles several bad obstructions were overcome, the channel narrow between rocks, was passed through by punting.

The fleet reached Chikuldah on the 20th April, and from the falls immediately below the Harunphal being impracticable, a third depôt must be at this place, where there is a bungalow belonging to the Bheel Agent. Chikuldah is on the right bank, and is a Purgunnah of Holkar. On the left is the petty state of Burwain, the chief town of which, Burwain, is about 4 miles from the river opposite to the small town of Chikuldah.

As further progress by water at this season (April) was impracticable, the coal was housed and Captain Fenwick started by land for Baroach on the 27th, with 48 maunds laden on 26 bullock carts; the road was good viâ all Rajpore (which he reached on the 30th), Oodeypore (on the 5th May), to Kunnolee Chandood on the Nerbudda, where he arrived on the 10th. The cost of land carriage was 14 annas per maund. Here the coal was again shipped on two small boats, and conveyed to Baroach in three days without delay or impediment. Having made the coal over to the Collector of Baroach, Captain Fenwick returned on the 20th according to his instructions, by water, and sailed up to Aktasur, about 15 or 16 miles above Kunnolee, arriving on the 26th, having been six days en route. His further progress upwards was arrested by there not being water enough to float the smallest boat he had with him.

Between Chikuldah and Aktasur the Nerbudda, except in the rains, is wholly impracticable and useless as a stream for the purpose of commerce.

Captain Fenwick returned by land to Chikuldah and thence to Mundlaisir, from whence he took down to Chikuldah two boats which had been built for the experiment; on the 10th July these boats were taken over the Sahesurdarrah barrier with the greatest trouble.

On the 29th July, the river being pretty full, though the rains had



been under an average, Captain Fenwick left Chikulda with about 400 maunds of coal on 8 boats. Captain Fenwick led the fleet, and a spare boat with a native writer, brought up the rear; to the Harunphal, 13 miles, the fleet dropt down easily, not a rock or a ripple to be seen, and passed the Bhoire Kheeree rapids, extending for about 5 miles, under great apprehension from numerous half sunken rocks, and the current running with great rapidity. At the mouth of this channel one of the boats was dashed on a rock and instantly turned over; nothing more was seen of it until the next day, when it was found broken and swamped. The boatmen swam to the shore; 38 maunds of coal were lost. This was the first casualty; the boatmen were alarmed, it however served to render them more cautious.

The fleet proceeded on the 30th July, and passed first through a channel 30 feet wide at Kulakurar, the current rushing with great force, then the Dussana rapids, which were rather dangerous—the boats shipping water from the high waves to Bhutara, which place was reached without any damage. Total distance 20 miles.

On the 31st, for about  $\frac{1}{2}$  mile the boats were eased down with ropes under high precipitous cliffs, over shallow rocks. The passage of the Bhutara rapid,  $2\frac{1}{2}$  miles, occupied the day. The boats were first lightened and then passed down by two distinct channels—that on the left being the most formidable.

On the 1st August, at two miles below Bhutara the fleet passed through the Hailkurree Gap, the current not strong, between perpendicular cliffs for half a mile, to the Serkuree shoal and rapids, extending from bank to bank, leading to the formidable Noukoghat—one of the worst places in the river, in getting through which some of the boats had a very narrow escape. The progress this day was only  $5\frac{1}{4}$  miles.

On the 2nd, about a mile above Hanep two of the boats became unmanageable in the high waves of a rapid and were swamped, with 61 maunds of coal; the boatmen saved themselves by swimming. This is a very difficult part of the river, and about 6 miles of progress was only made this day. The distance from Chikuldah Hanp is computed to be  $51\frac{1}{2}$  miles.

On the 3d, shortly after leaving Hanep, is the narrow and dangerous channel of Bhallagoree running between high precipitous rocks, and extending for about 3 miles, and at the outlet a very formidable whirl-

pool was encountered. The distance accomplished this day was about  $8\frac{3}{4}$  miles.

On the 4th August the fleet made 14 miles, the river the whole way more or less obstructed with rocks, rapids and whirlpools; especially bad near Surpan, where it came to.

On the 5th, the fleet passed the dangerous shoals and rapids of Mookree, terminating in a whirlpool, and reached Emria,  $10\frac{1}{2}$  miles. The native writer's boat, which brought up the rear, struck on a rock and stranded. The people swam to the shore.

Having got the boat off on the 6th, the fleet proceeded on without further difficulty, and reached Baroach on the 9th, and deposited 302 maunds of coal in the Government Customs Godowns at that place. Captain Fenwick left Baroach on the 3rd October, having freighted a Botellah for Bombay with the coal. Off Taraparee Chunchun, the storm, which set in on the evening of the 7th, drove the Patemars far out to sea, and compelled them to put back some distance above Surat; this delayed the arrival at Bombay until the morning of the 15th, when eleven tons and ten cwt. of coal were delivered at the Dockyard, and the experimental voyage terminated.

The casualties en route were 3 boats, 98 maunds of coal, and the baggage of the boatmen. No lives were lost, and no one suffered any personal injury from accidents. The crews were generally healthy, supplies plentiful, and the Bheel tribes most attentive and useful whenever their services were required.

Captain Fenwick having deposited the coal set out from Baroach on the 15th September for Chikuldah *by water*, with the six small boats he had taken down, taking only the baggage of the boatmen and supplies for the party; the fleet reached Chikulda on the evening of the 7th September, after great exposure, but without loss, or meeting with any serious accident. Laden boats could not by any possibility have come up in the then state of the river, generally about half full and latterly very high. The Bareekheree shallows and the Huranphal rocks were completely under water.

The result of the experiment may be summed up as follows: that from Dhairee to Chikuldah it would be quite practicable, with a portage at Sahesurdarrah, to take down coal after an average rainy season throughout the year, in such boats as are at present employed in the

small intercourse between those two places. From Chikuldah to Aktesur, the navigation in the rains, &c., when the river is full, will always be attended with difficulty, danger and risk; but the impediments are not insuperable, and having overcome them, there is no difficulty to Baroach.

The actual cost of conveyance of the coal from Dhairee to Bombay was 1 Rupee 2 annas per Bengal maund by contract, as follows :

	<i>Rs.</i>	<i>As.</i>	<i>P.</i>
Dhairee to Sahesurdarrah, .....	0	4	0
Chikulda, .....	0	4	0
Baroach, .....	0	8	0
Bombay, .....	0	2	0
	<hr/>		
	Rupee 1	2	0

It may be reasonably anticipated that this charge would be considerably reduced, supposing depôts were formed and a regular system introduced.

With regard to the practicability of laden boats being brought up from Baroach to Chikuldah *at any time*, it is almost premature to form an opinion. I should, however, say the Nurbudda navigation is impracticable for purposes of trade.



*Note on the Sciuri inhabiting Ceylon, and those of the Tenasserim provinces.—By E. BLYTH.*

Since the publication of my Report on the species of Squirrel inhabiting India proper, Ceylon, Assam, and the whole eastern coast of the Bay of Bengal down to the Straits of Malacca (*J. A. S. XVI, 868 et seq.*), my obliging coadjutors E. L. Layard, Esq. and A. O. Brodie, Esq. in Ceylon, and Captain Berdmore at Maulmain, have favored the Society with various specimens of *Sciuri*, comprising some additional species to those noticed formerly as inhabitants of their respective regions.

Five species inhabit Ceylon, as follow :

1. *Sc. bicolor* (?), var. ; *n. s.*? *Sc. Teanentii*, Layard. Resembles in size and colouring the common large species of the whole eastern coast

of the Bay of Bengal, except that the caudal hairs are always largely tipped with white, save at the base and the extreme tip of the tail,—there is no black moustachial mark nor black border beneath the eye, but a large triangular patch of black behind it and reaching upward to the ear,—also a rusty spot at the base of the ear posteriorly, and the auricle is well fringed with hair, though less copiously than in *Sc. purpureus*,—finally there is much more fulvous-white upon the limbs, leaving only the toes of the fore and hind limbs black. In the common *Sc. bicolor*, the posterior limbs are wholly black externally, and the anterior are wholly black behind, and more or less so externally. In the Ceylon animal, both fore and hind limbs are fulvous-white all round for the lower half, the extremities or toes alone being black. This race has accordingly quite as good a claim to be distinguished by a separate name as either of the other large races of S. E. Asia; and it is interesting to know that it co-exists in Ceylon with *Sc. macrourus*, though in a different region, the two (as Mr. Layard assures me) never infringing on each other's territory. It also attains a much larger size than *Sc. macrourus*, being that of *Sc. purpureus* and *Sc. bicolor*: and it is wholly confined in its range to the Kandian country and the more elevated districts generally of the island.

2. *Sc. macrourus*, Forster (described *J. A. S. XVI*, 869). The common large Squirrel of the western districts of Ceylon, to which it would appear to be wholly peculiar.\* It does not attain above  $\frac{2}{3}$  the size of the last. Mr. Layard favoured me with a living specimen, which was extremely tame, and is chiefly perhaps remarkable for its singularly loud and harsh voice. Indeed, the voice would seem to be an excellent criterion of specific distinction among the *Sciuridæ*. This animal carries its tail in the same peculiar manner, curled round on one side, as is observable in *Sc. purpureus* and *Sc. bicolor*, and doubtless all others of the same group.

3. *Sc. tristriatus*, Waterhouse (*J. A. S. XVI*, 874, 1001). This would appear to be the most common species of Palmist Squirrel in Ceylon (vide Elliot, in note to *J. A. S. XVI*, 1272); and I can discover no difference between Cinghalese specimens and examples procured in the

\* That is, in the island; for it is also met with in Travancore, and other neighbouring districts of continental India.



vicinity of Midnapore: one of the former is remarkable for having a strong ferruginous tinge on the upper part of the head.\*

4. *Sc. Brodiei*, nobis, *n. s.* Very similar to the last, but distinguished by its considerably paler colour, and especially by having a very long pencil-tuft ( $3\frac{1}{2}$  in.) at the extremity of the tail, quite different from what is ever seen in *tristriatus*: beneath the tail, to near its tip, ferruginous as in the other. According to Mr. Layard, "this species is confined to the Palmyra-tree district, from Puttam to Jaffna. How much further round the coast I know not."

5. *Sc. Layardi*, nobis, *n. s.* Size of the two last, but the colour very much darker, nearly as in *Sc. trilineatus* (vel *Delesserti*), but inclining more to ashy than to fulvous, except on the head and flanks: lower-parts ferruginous, paler on the breast: middle of the back nigrescent with a strongly contrasting narrow bright light fulvous streak in the middle, reaching from between the shoulders to near the tail, and an obscure stripe on either side, barely reaching to the croup. Tail ferruginous along its centre, the hairs broadly margined with black and finally with whitish, besides which is another and narrow black band on each hair towards its base, chiefly seen as the tail is viewed from above; tip black, forming a pencil-tuft 3 in. long. This handsome species is, I believe, peculiar to the upland districts of the island.

In the Tenasserim provinces, I am now acquainted with 6 species.

1. *Sc. bicolor*, Sparrman (*J. A. S.* XVI, 870). Common; but the pale Malayan variety does not appear to have been hitherto observed (though the pale Malayan variety of *Hylobates lar* is there common).

2. *Sc. chrysonotus*, nobis (*J. A. S.* XVI, 873). Common.

3. *Sc. pygerythrus* (?), Is. Geoffroy, var.? Described *J. A. S.* XVII, 345.

4. *Sc. atrodorsalis*, Gray (*J. A. S.* XVI, 872-3, XVII, 345). I have no doubt now that this species was rightly identified, and that Mr. Gray's habitat of Bootan is erroneous. A third specimen lately received from Captain Berdmore is intermediate in its colouring to the

\* In a letter just received from Mr. Layard, he now mentions that—"at Hambanlotte I got a new *Sciurus*; like *palmarum*, only the head is much redder, the colour of the back and belly more blended, and the animal altogether smaller. This entirely replaces all the small *Sciuri* in that part of the country: they are first seen at Tangalle, and I fancy extend round to Trincomalee."

two formerly described, having the under-parts much lighter ferruginous than in the one, and considerably darker than in the other.

5. *Sc. Berdmorei*, nobis, *n. s.* Nearly one half larger than *Sc. palmarum*: the prevalent colour grizzled black and golden fulvous, with an obscure pale central dorsal streak, flanked by a blackish band: this again by a conspicuous yellowish-white line from the shoulder to the croup; then blackish again, with a second lateral whitish band; below again dusky; and the under-parts yellowish-white, passing to ferruginous towards the vent and underneath the tail. Head tinged with ferruginous: and from what remains of the base of the tail in the specimen, this would seem to resemble in colouring that of *Sc. Layardi*. Length of hind-foot from heel to tip of claws  $1\frac{5}{8}$  in. Rodential tusks deep orange-brown. This species, according to information received from Mr. D. F. Lonsdale, inhabits the Thoungyeen district.

6. *Sc. Barbei*, nobis (XVI, 875). Common in Mergui.

There are no *Sciuri* more difficult to understand than the group exemplified by *Sc. modestus*, Muller, *Sc. lokriah* and *Sc. lokroides*, Hodgson, *Sc. griseopectus*, nobis (XVI, 873), and of which *Sc. chrysonotus* is one of the species best distinguished from the rest. Three specimens lately purchased with a collection formed at Darjiling, differ from all other examples of *Sc. lokroides* which I had previously seen from that and other localities, in having the thighs externally of a bright ferruginous colour: in other respects they are quite similar to ordinary individuals of the species.

N. B. The specimen presented by the Batavian Society and described as *Sc. javensis*, Schreber, var., in *J. A. S.* XVI, 871, is *Sc. ephippium*, Muller, from Borneo.

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*Supplementary Notes to "The Turae and Outer Mountains of Kumaon;" Journal of Asiatic Society, Bengal, May and June, 1848.—*  
*By Major E. MADDEN, Bengal Artillery.*

The following corrections of, and additions to, the Flora of the notes referred to, are the result of subsequent visits by Lieutenant R. Strachey and myself to the localities specified; as well as of an examination of

the whole of the plants collected, by Mr. M. P. Edgeworth, to whose assistance I am indebted for the original catalogue in the majority of cases, and for his determination of those where alteration is requisite in the present. The completion of the lists is so far interesting as, to the best of my knowledge, they are the first, exhibiting at one view, the grouping of the plants to be found at any given position in these mountains.

At the end will be found an attempt to identify the plants described, but frequently not named by the late Major-General Hardwick, in his tour from Hurdwar to Sreenugur in Gurhwal, in the year 1796, as detailed in the sixth volume of the Asiatic Researches. The General's route did not conduct him by any means over a tract botanically rich, while he omits many plants which must have occurred; but the paper may be interesting to the Asiatic Society, as tending to elucidate the work of one of its original members, and probably the earliest labourer in the field of Himalayan Botany, as it is to the writer, from the circumstance that the Major-General was his first commanding officer.

Jiaree, p. 352. Kunthagaon, p. 590. The shrub here inserted as *Desmodium*? is *Rhynchosia pseudo-cajan*, (Decaisne,) known in Gurhwal as "Bun-tour," of which the specific name is a translation.

P. 355. The shrub here called *Gouania leptostachya*? is, I doubt not, Dr. Wallich's *G. nepalensis*, and appears to have been first noticed by General Hardwick near Hurdwar, where, as indeed all along the mountains, this common *G. leptostachya* is abundant in the Kotah Doon, and generally at the base of the mountains, and in the exterior vallies, down to Burmdeo: it is known by the same name (*Kala-lug*, the black climber) as *Berchemia floribunda*, which it resembles a good deal in habit.

*Carissa diffusa*, (not *Carandas*,) very abundant on all the outer mountains and along their base.

Nynee Tal, pp. 364—372—Add—

*Ulmus virgata*.

*Heracleum*.

*Sanicula elata*.

*Torilis elata*.

*Bupleurum marginatum*.

*Reutera acuminata*.

*Cortia elata.*

*Ptychotis anethifolia.*

*Acronema tenerum* (Edgeworth), on oaks at 8700 feet, Cheenur, where also is to be found abundance of a large plant of this order, not identified.

*Ilex odorata* : (Don's *Prodromus*) is the species inserted at p. 365, as Dr. Royle's *T. serrata* : both names are suitable. The tree occurs on the descent to Kaleedhoongee near Sirmouria village, as well as on the route from Cheenur to Kotah ; also near Deghat in Gurhwal : and Mr. Edgeworth has observed it near Simlah ; the identification with Dr. Royle's *T. serrata* is, therefore, probably correct. It is a large and very beautiful species, growing at from 3000 to 4000 feet above the sea, and is known in Kumaoon as Gurschoon and Gurkoula, where the prefix *gur*, denoting *glen*, points out its usual site.

*Cardamine impatiens.*

*Arabis*, Sp.

*Potentilla Wallichiana*, and another, not determined.

\**Rubus lasiocarpus*, *biflorus*, *asper*, *hypargyris* and *racemosus*? Roxb.

*Cotoneaster bacillaris*, (not *affinis*.) "Rous," "Rooes."

*Limonia laureola*. M. Decaisne, who has made a new genus (*Anquetilia*) of this, and removed it to the order *Xanthoxyleæ*, describes the fruit as being 1 seeded. Such is sometimes the case, but it is very generally 2 seeded. The young drupes or berries are even very commonly 3 seeded ; and in each case distinctly 2 to 3 celled, with the stigma 2 to 3 lobed, accordingly want of mature fruit prevents examination as to whether these cells are permanent, beyond the month of June : but certainly 2 at least of the seeds are so ; and from the fruit

\* *Rubus lasiocarpus* is the *R. rosæflorus* of Roxburgh, an identification which escaped Messrs. Wight and Arnott, who have only given his *albescens* and *racemosus* as synonymes. The latter seems doubtful, for *R. lasiocarpus* has a corymb, not a raceme. By *R. racemosus*, I mean a procumbent species, differing from *lasiocarpus* by its being racemose, by the leaves not being tomentose below, and by its trailing, nor erect habit. The flowers and fruit are similar : the former (red) : the latter black, and very woolly. The shrub is common in the woods from 6500 to 8000 feet, and is perhaps *R. micranthus* of Don. *R. hypargyris* is found on the crest of Cheenur, also with red flowers and woolly fruit : but yellow, not black.



in June, it is clear that the 1st seeded berry is produced by the suppression in some cases of the second seed and cell. The third cell and its seed are probably always abortive. The shrub is abundant where I write, (Binsur mountain,) attaining sometimes a height of eight feet. Its habit of flowering both in spring and autumn resembles that of Citrus, near which Dr. Lindley still keeps it; but the persistent calyx, and leaves not articulated with the petiole, are at variance with his character of the Aurantiaceæ; as the cells, with apparently only one ovule, are with that of Xanthoxylæ. The plant is, or recently was growing in the Botanic Garden, Glasnevin. Its range at Nynsee Tal is from 6600 to 8600 feet.

*Xanthoxylon oxyphyllum*. On Luriya Kanta, and observed by Mr. Edgeworth on the ascent from Koorpaka. It comes very near *Brucea Sumatrana*, as defined and described by Roxburgh, and may be the *B. nepalensis* mentioned in J. A. S. April 1833.

*Rhus velutina*.

*Machilus odoratissimus*.

*Daphnidium pulcherrimum*.

*Litsæa consimiles*. "Cheerura," and "Chírchíra" of upper Kumaon and Gurhwal, where a coarse oil is expressed from the fruit.

*Albizzia wightii* (and elsewhere; not *Acacia mollis*.)

*Indigofera polyphylla*, "Moos-Sukena," a half procumbent shrub, common from 5500 to 8500 feet.

*Indigofera pulchella*. At the elevation of 7500 feet, as well as in the outer portion of the Bhabur forest, this is equally reduced to the height of a few inches. But in the Sal forests at 2000 feet and upwards, it gradually increases from a shrub of 3 to one of 12 feet; under the former aspect it appears to be Dr. Royle's *T. Arghawan*. The number of arborescent *Indigoferas* has probably been exaggerated. Roxburgh's *T. arborea* and *virgata*, seem to be *T. Dosua* of Don, and *heterantha* of Wallich. In the vallies of Kumaon, about Almorah and Somesur, at 4000 to 7000 feet, there is a shrubby species with short sericeous legumes, and small flowers, which appears different from *T. Dosua*, and may be *I. violacea*, but Mr. Edgeworth pronounced it to be *T. Dosua*. Roxburgh's description of the shrubby species of this genus are indifferant.

*Desmodium sulcatum* (Edgeworth), and two undescribed species.

*Podolotus Hosackioides*.

*Crotolaria anthylloides*, to 8000 feet.

*Lespedeza elegans*.

*Flemingia*, (bracteata, Roxb. nearly,) a procumbent shrub with simple leaves and *Dicerma*, like inflorescence: flowers white, streaked with pink: everywhere at 6000—8000 feet on sunny exposures, from the Sutlege to the Kalee.

*Flemingia procumbens*. Procumbent, with deep red flowers and tuberous edible roots, very common from 5500 to 8500 feet; also Simlah, Kussowlee, Mussooree.

*Shuteria involucrata*.

*Phaseolus scaber*.

*Vicia tenera*.

*Pachyrhizus angulatus*? Procumbent, twining, with pink flowers, and large tuberous root.

*Trigonella gracilis*. This plant, with *Argyrolobium roseum* and (cytisis) *flaccidum*, is everywhere at Nynsee Tal in the rainy season, apparently limited to the limestone rock: at least all three disappear the moment we reach the greenstone of the Gagur, with identical elevation and exposure, &c. *Thymus serpyllum*, on the contrary, does not here make its appearance till we have left both these rocks, and entered the micaceous slate district at Ramgur.

*Androsace sarmentosa* (not *lanuginosa*, which is not found under 10,000 or 11,000 feet.)

*Androsace rotundifolia*. Hardwick, *pink*.

*Lysimachia debilis* and *alternifolia*.

*Sedum multicaule*, *pauciflorum* and *rosulatum* (Edgeworth, not *pyriforme*.)

*Tillæa pentandra*, to 8000 feet.

*Saxifraga Brunonis* covers the crags of Cheenur, facing the lake, from 7000 to 8000 feet.

*Drosera peltata* (*lunata*, auct,) a New Holland plant. Don.

*Astilbe rivularis*. Abundant in the northern glens of Cheenur, &c., and as low as 5500 feet at Shamkhet. This plant, which resembles *Spiræa Aruncus*, oscillates between the Saxifrageous and Rosaceous orders, and both in Royle's Illustrations (203, 226) and Don's Prodrumus, does duty in each *cohort*, being *Spiræa triternata* of Wallich, S.

barbata of Decaisne, and *S. Aruncus* of Don, who had previously described it at full length under *Astilbe rivularis*.

*Clematis grata*, not common at Nynee Tal.

*Clematis amplexicaulis*, Edgeworth, 7000—8500 feet.

*Clematis Nepalensis*, south face of Sher-ka Danda, also at Murora, on the Nyar in Gurhwal; always in or by running water, between 6000 and 6500 feet above the sea. On the young flowerless shoots, the leaves are triternate; such variations are not uncommon in this genus, and have perhaps augmented the number of species in books beyond that in nature.

*Aquilegia pubiflora* (not pubescens.)

*Pæonia Emodi*. In beds of many hundred plants before me at Binsur, not above one in ten flowers has two carpels, a number common in the interior. The plant does not, to my knowledge, extend further N. W. than Dhunpoor mountain, one of the sources of the Nyar. In that and the neighbouring districts the young shoots are eaten as a vegetable under the name “Soojoonia,” though the plant is called Chundra; it is probable that the long tuberous roots may be one of the species of *Bikkh*.

*Epilobium montanum*, *cylindricum*, and *laxum*?

*Circæa repens* and *intermedia*.

*Berberis Wallichiana*? summit of Cheenur only, 8700 feet.

*Berberis asiatica*. Kilmora: to 7500 feet, as on Binsur and Siyahee Devee.

*Vitis tomentosa*, *rugosa*, on Sher-ka Danda.

*Aralia* or *Panax*. Shrubby, and probably undescribed.

*Millingtonia* (*Meliosma*) *Dillenifolia*. Luriya kanta.

*Polygala triphylla* and *crotolarioides*.

*Stephania Wightii*, common at 6500—7500.

*Bryonia umbellata*.

*Trichosanthes palmata*. Outlet of the lake, 6400. Perhaps its upper limit.

*Hypericum cernuum*, *Uralum*, *barbatum*, *elodeoides*.

*Acer villosum* (and on Binsur: a beautiful species.)

*Rhododendron arboreum*, (puniceum, Roxburgh.) Captain A. Gerard, account of Koonawur, says, that the tree with ‘large red flower’ ascends to 10,000 feet: but in Kumaon and S. E. Gurhwal, we only

find the variety? *floribus roseis* at this elevation, and up to 11,300; as determined by Lieut. Strachey. It is only while young that the leaves, and still more the leaf-buds and scales of the scarlet *Rhododendron* are poisonous; the flowers are certainly intoxicating, if eaten in any quantity, as I have seen exemplified in my own coolies.

*Linum trigynum.*

*Phyllanthus* (*Leptopus*, Decaisne) *cordifolius*.

*Phyllanthus parvifolius*, Don.

*Euphorbia hirsuta* (not *involucrata*), probably *E. longifolia* of Don's *Prodromus*. A pretty species, resembling the English wood spurge.

*Euphorbia* (*peplodes*.)

*Schizotechium crispatum*.

*Leucostemma latifolium*.

*Stellaria media*.

*Cerastium triviale*.

*Mollugo stricta*.

*Hedyotis calycina*.

*Randia* (*Gardenia*) *tetrasperma*.

*Galium asperuloide*, Edgeworth. Descends to 7500. It has the appearance and fragrance of *Asperula odorata*, but differs in the leaves from Mr. Edgeworth's species.

*Galium aparine*, common in cultivation, hills and plains, from the Ganges to Nynee Tal and Almorah.

*Viburnum cylindricum*, probably Dr. Royle's "*punctatum*." "*Kala Tit-muliya*." This shrub is an evergreen, and is common from Simlah to Kumaon, from 6000 to 8000 feet, as are *V. cotinifolium* and *mullaha*. Of these *V. cotinifolium* is identified by Dr. Royle with Wallich's *polycarpum*; and *mullaha* with *stellulatum*. The nature of the plants would lead to a suspicion that the synonymes have been reversed, *V. cotinifolium* being remarkable for its stellate pubescence, as *V. mullaha* is for its abundant fruit: (red.) It preserves the Nepalese name to Kumaon, (*Muliya*, and *Tit-muliya*, from the bitter fruit) and even to Mussooree, (*Maloop*;) but at Simla this is lost, and replaced by *Eree*. *V. cotinifolium* is known as *Jawa* at Simlah, *Gooya* in Kumaon; it has black fruit, and much resembles *V. lantana*. *V. nervosum* of Don's *Prodromus* is identical with his *cotinifolium*; *V. nervosum* of Royle is the *V. foetens* of Decaisne, an epithet for which it is indebted to the odour of its leaves when



crushed ; the flowers however, have a delicious fragrance of lemon. It abounds everywhere from 9000 to 11,000 feet, the “Thelain” of Busehur, but in Kumaon “Gooya.” *V. grandiflorum* was found common on the upper Surjoo by Lieut. Strachey, with the habit of *V. mullaha* : where also occurs another species, perhaps *punctatum* or *adenophyllum* of Wallich ; growing to be a considerable tree.

*Daphne papyracea*, Wallich, *D. Bholua*, Don, formerly inserted as *D. cannabina* on the authority of the former in the Asiatic Researches, unless the shrub there described be *D. odora*, which seems to differ little from the present except in being fragrant. Two varieties are common everywhere in the British Himalaya ; one with white flowers and yellow fruit, is found from 4000 to 8000 feet ; the other with purple flowers and fruit from 7000 to 8000. “The Nepal names Bhulloo-soang and Bholua, if Hindee, and the aspirate be correct, would indicate its poisonous property ; without the aspirate, the strength of its fibre : *Sida rhomboidea* is called Buloo for this reason. But the orthography in Kumaon is “Buroowa,” with the prefix, *set*, white ; “Sutpoora” in Gurhwal. No allusion to the plant or its uses is to be found in Dr. Wilson’s Dictionary ; but the Almorah Pundits affirm that it is intended in the Umurkosh by the terms Loota, Tuntoovayu, Oornunabhu, and Murkutka, all denoting a spider, weaver, &c., and, as applied to this *Daphne*, alluding to the manufacture of paper from the bark.

*Daphne sericea* ; Don’s Prodrômus ; an examination of many living specimens satisfies me that this includes *Wickstroemia salicifolia* of Decaisne, and *W. canescens* of Meisner ; the differences are merely in degree, due to age and exposure, and may either be found on the same plant, or on plants within a few yards of each other, and evidently of the same stock. Paper prepared from this—the *Chumlia*, is considered inferior to that of the Set Buroowa, allowing the ink to run. The bark makes a strong rope, and is so used at Nynee Tal.

*Osyris Nepalensis*. Descends from 7000 to 1200 feet along the foot of the mountains ; none of the people about Almorah are aware of its leaves being used for tea.

*Geranium bicolor*, Royle, *Ocellatum*, Decaisne ; from 1500 to 7000 feet.

*Impatiens umbrosa* and *tricornis*.

*Evonymus echinata*, a shrub climbing like ivy over trees and damp-shaded rocks, tetramerous.

*Urtica* (*Girardinia*) *heterophylla*, to 7500 feet.

*Urtica parviflora*.

*Urtica Goglada*.

*Pouzolzia* (*Urtica*) *hispida*.

*Cannabis sativa*.

*Bœhmeria salicifolia*.

*Procris*—several species.

*Ficus laurifolia*.

*Ficus saxatilis*? a creeping, rooting species, on trees, rocks and banks, to 8000 feet.

*Myrica sapida*.

*Salix tetrasperma*, "Gur-by-nsh." Grows well along the margin of the lake, but scarcely indigenous, as it appears to flower with difficulty, and is here about a thousand feet above its usual limit elsewhere in the province.

*Salix leucomelas*, Cheenur. Forms dense thickets, from 8000 to 10,000 feet. Common at Fagoo, Huttoo, &c.

*Callitriche verna*.

*Elæagnus parvifolia*? Gheewaeen.

*Aristolochia* (*Saccata*?) 6500—8000 feet; Sher and Boorans ka Danda, common on Binsur, the Gagur Pass, &c.

*Rumex nepalensis* and *hastatus*, the last to 8500 feet.

*Pupalia sequax*.

*Achyranthes*, a large white-flowering species; undescribed.

*Polygonum sinense*, *pterocarpum*, *herniarcoides*: the last as high as 7500 feet.

*Plantago asiatica*.

*Viola aspera* and *Patrinii* (*cæspitosa*, Don.)

*Craniotome versicolor*.

*Micromeria biflora*.

*Leonurus pubescens* (not *Sibiricus*.)

\* *Scutellaria scandens*. From 4000 to 8000 feet, a species utterly mis-

\* In the original paper it is twice, (pp. 369, 435,) mentioned that *Melissa flava* grows on Binsur. This is a mistake; the plant intended is a *Nepeta*, probably *N. elata*, Royle. It also occurs on Cheenur at Nynee Tal, and is remarkable from the

named, being in no degree scandent, though Don asks "an potius volubilis!" Mr. Bentham's name, "*angulosa*," is very appropriate and should be substituted. So *S. repens* is an erect shrub, and requires an epithet expressive of its numerous stems and branches. Many Himalayan plants bear evidence that they were named by persons who never saw them. *Rosa macrophylla*, for example, has not large leaves; they are much smaller than those of the common *R. Brunonis*.

*Begonia tenella*, (not *dioica*.)

*Clerodendron foetidum*.

*Phryma leptostachya*, common in woods.

*Mazus surculosus*.

*Vandellia nummularifolia*.

*Veronica biloba* and *Maddenii* (n. s. Edgeworth.)

*Torenia cordifolia*.

*Datura alba*.

*Solanum rubrum*.

*Goldfussia pentstemonoides*.

*Erigeron semibarbatum*.

*Erigeron Roylei*, "*Murchmool*." (Not *Aster bellidifolia*.)

*Inula nitida*.

*Conyza veronicæfolia*.

*Diplostephium Roylei*.

*Carpesium pubescens*.

*Oreoseris gossypina*, from 1500 to 8000 feet, (not *Onoseris lanuginosa*.)

*Senecio rufinervis*, (not *canescens*.)

*Senecio spectabilis*, (not *Jacobæa*.)

*Senecio alata*, on Cheenur, but rare.

*Amphirapis cuspidata*.

*Amphirapis pubescens*. (*Solidago nepalensis*, Don.)

*Echenais ferox*, probably the *Cnicus verutus* of Don. It grows from 4500 to 7500 feet, and is found up to Paoree in Gurhwal, and probably much further. If it is Don's plant, it also inhabits Nepal "ad Narainhetty," a spot in the vicinity of Kathmandoo, where per-

flowers opening yellow in the morning but becoming light blue by the afternoon; an example of natural Daguerreotype.

haps from some error in the labelling of Dr. Hamilton's Herbarium, the *Prodromus* exhibits the most incongruous assemblage of plants.

*Apotaxis carthamoides*, a very bitter plant, probably *A. scaposa* of Mr. Edgeworth, *Serratula carthamoides*, Roxb. and *Cnicus heteromallus* of Don.

*Serratula pallida*. *Centaurea lanata*, Roxb. III. 444, seems to be a Calcutta edition of this.

*Dicrocephala gracilis*.

*Blainvillea latifolia*.

*Sonchus arvensis*.

*Melanoseris cyaneus*, (not *Mulgedium robustum*.) It is occasionally white.

*Dipsacus inermis*  $\beta$ , Wallich, *mitis*, Don, is abundant everywhere from 5000 feet, (Almorah,) to above 8700 (Cheenur), while *D. inermis*,  $\alpha$ , Wallich, *strictus*, Don, occurs at Kathmandoo (4500), Koorkpaka, (5000) and on Cheenur at 8000, but I consider it merely a variety of the first, as every gradation in the number of lobes to the leaf, and every variation in the number of ridges to the stem may be observed in these supposed species. Under this view, the plant affords a striking instance of depression in its habitat as we travel to the S. E., barely occurring at 8000 feet, Simlah, but at 4500 or thereabouts, in Nepal, according to Dr. Wallich.

*Valeriana elata*.

*Gentiana capitata* and *pedicellata*. *G. Kurroo*, so common on the limestone crags of Mussooree, has not hitherto occurred here.

*Ophelia* (*Agathotes*) *cherayita*. The tetramerous, purple-flowered variety (with a tendency, however, to greenish-yellow) mentioned by Dr. Royle, occurs from 7000 to 9000 feet, in shady woods with northern aspect, on Cheenur, Binsur, Gagur Pass, Mussooree, Simlah, and Nagkunda; and though called by Dr. Lindley, "a Himalayan annual," is in truth, the only perennial *cherayita* with which I am acquainted. The stem is sometimes five feet high, and much branched; the root long, forked, and pale yellow; the root-leaves, petioled, and resembling those of *Plantago*; the whole exceedingly bitter; but the plant is not very abundant; and it is probable that the annual species, *purpurascens*, *cordata*, *alata*, *angustifolia*, &c., supply the chief portion of what is exported to the plains.



*Campanula cana*, (not *ramulosa*.)

*Cynanchum glaucum* and *Dalhousiæ*.

*Tylophora tenerrima*? amongst grass, Sher-ka Dauda, *Gardneria ovata* (or new species.) Haneé Banee rocks; also abundantly on Binsur and the northern slope of the Gagur Pass.

*Pardanthus Sinensis*.

*Juncus glaucus* and *concinus*, (not *elegans*.)

*Smilax Villandia*, *maculata*, and *vaginata*, the last on Cheenur; on Binsur at 7300.

*Allium Wallichianum*, (not *lilacinum*.)

*Murdannia scapiflora*, (v. *Aneilema longifolia*?)

*Dioscorea sagittata* and *deltoides*.

*Arisæma speciosa*. Luriya Ranta. Several other species undetermined.

\**Remusatia* (*capillifera*, provisionally. M. P. E.) Probably Don's *Caladium pumilum*. "Banj ka pindaloo," i. e. *oak colocasia*, common on trees and mossy rocks from 5—6000 to 8—9000 feet. At p. 438, it is confounded with *R. vivipara*, which however is quite distinct, and does not appear to ascend above 4500 feet, as Bheem Tal and Noukoochia Tal, where it is known as "Bagh ka pindaloo," i. e. Tiger's *Colocasia*.

*Cephalanthera acuminata*. White wood Orchis, May.

*Lycopodium tenellum* and —.

*Gymnogramme vestita*. Top of Deoputa.

*Dactylis glomerata*.

*Ischæum speciosum*, a strong and tall reed-like grass, in abundance under trees, north face of Cheenur, &c., from 7000 to 8,700 feet.

*Arundinaria falcata*, "Ningala," not *Vingala*, p. 371. The people

\* The opinion is general amongst the people of Kumaon that this plant never flowers; and the majority do not, as is common with plants reproduced by bulbs, &c. These appear in September on radical procumbent panicles, (not erect spikes as in *R. vivipara*,) and the scales each ending in a long white spirally twisted awn give the whole the appearance of a tangled mass of thread. The flowers appear in June, a little before the rains set in, and before the leaves expand, and as the scapes are only 2 or 3 inches high, and soon curve down amongst the moss, &c., are easily overlooked, though the spathe is of rather a bright yellow; much like that of a small *Arum* with pedate leaves common at Simlah, and as far up as Cheenur in Kunawar.

of Danpoor Pergunna, in the north of Kumaon, enumerate no less than eight kinds of Ningala, or Ringal, as it is pronounced in Gurhwal, viz., 1. Tham ; 2. Utham ; 3. Kutino ; 4. Malingo ; 5. Jhoomro or Jhoongra ; 6. Deo Ningala ; 7. Gor Ningala ; 8. Doom Ningala. The last is probably the common, or Kalee Ningala, found abundantly on the Gagur range, and, like the Jhoomro, in much request for pens. My friend Dr. Falconer refers it to a new genus, *Thamnocalamus*. No. 1, is said to be the largest of the whole, and is sent down to the plains for hookkah pipes ; but I have never noticed it, or any but the last three. No. 6, is the *Arundinaria utilissima* of Mr. Edgeworth, and occurs in great abundance near the snowy range : making excellent mats, baskets, fishing-rods, &c. No. 7, I met with all along the Undreetee river below Rol in Busehur, (there called *Gol*) with thin culms 18 feet high, in dense clumps of a hundred or more to each.

The tree entered at p. 372, *Gyandra laurina* is that which Dr. Royle alludes to, p. 261, under *Ilicinæ*. It rather belongs to *Flacourtiaceæ*, Mr. Edgeworth informs me, as well as that the name *Gyandra* has been previously appropriated to one of the *Gentianæ*.

To the lake plants enumerated at p. 358 are to be added—

*Myriophyllum tuberculatum*.

*Potamogeton crispum, pectinatum, parfoliatum*.

These and the other Himalayan species of this genus are all identical, Mr. Edgeworth informs me, with those of Europe ; the presence, therefore, of *Polygonum amphibium* in Nynsee Tal, becomes less anomalous ; and considering the number of aquatic birds which frequent the lake, Gmelin's theory of diffusion by their agency does not seem an unlikely solution of the problem as to how these plants came here.

The following memorandum by Lieutenant Strachey, which reached me too late for insertion in the original paper, may be best introduced here ; the elevation of localities at Nynsee Tal being those chiefly affected.

“The heights of places in Kumaon, given on my authority in Major Madden's paper on ‘The Turæe and Outer Mountains of Kumaon,’ are to be considered as mere approximations to the truth. Those at Nynsee Tal and its immediate vicinity, are, I think, generally 200 feet too little. They were calculated on the assumption that the water of the lake was 6200 feet above Calcutta, whereas there is every reason to suppose that the true elevation is nearly 6400 feet.”

6409 is Lieutenant Strachey's determination, which will give for		
Cheenur,.....	8732	
Cheenur (or Deoputa) ka Khan,	7623	
Uyarpata, .....	7908	
Luriya Kanta, S. W. peak, ....	8169	
„ „ highest, ....	8200	
Kotah Bagheechu,.....	2269	(2269)
Gagur Pass, .....	7200	
Ramgar Bungalow,.....	5945	
„ Bridge,.....	4884	
Pecoorah Bungalow, .....	5644	
Almorah station (Mr. J. Strachey's House), .....	5586	
Birond Peak, p. 394,.....	7052	(Trigonometrical Survey.)
Kaleedhoongee, .....	1370	
Huldwanee Mundee, .....	1549	

From the Bumouree or Káth-godam bungalow, at the base of the mountains, 1809 above the sea, to the southern limit of the Huldwanee cultivation, a distance of 6 miles, the fall was determined by Captain Jones of the Engineers to be 360 feet ; it continues at such a rate that Rampoor is only 547, Moradabad 674 feet, and Bareilly 470 feet above the sea : such is the glacis in front of the vast bastions of the Himalaya.\*

\* The heights of several places in Kalee Kumaon inserted chiefly on the authority of Dr. McClelland's map are generally several hundred feet too much ; the following, from barometrical observations, by Mr. John Strachey, are very near the truth.

	<i>Feet.</i>
Bylchheena Pass, .....	3709
Belkhet,.....	1525
Chhirapanee, .....	6454
Kanadeo, .....	7241
Jhoom (Sooe),.....	7105
Dhurgura (Thermometer H. S.) .....	4500
Kunthagaon (ditto) .....	3900
Puyapanee,.....	7049
Dol Bungalow (Thermometer H. S.) .....	5438

Between Nynee Tal\* and Kalaputhur, pp. 373—375, Add—  
*Cucumis Hardwickii*, up to Koorpaka.

*Leea aspera*.

*Hedera terebinthacea*.

*Ruta albiflora* : descends to 3000 feet, near Kalaputhur, to 4000 at Bheem Tal; but in the drier region of Almorah not below 5000.

*Coriaria Nepalensis*, from 2000 to 7600. Dr. Royle gives the lower limit about Mussooree as 5000.

*Sageretia oppositifolia*.

*Impatiens balsamina* : 4000 to 5500.

*Ilex odorata*.

*Polygala oligophylla*, at 2500.

*Desmodium Gangeticum*.

*Argyrobium roseum*, from 2500 to 7500. Very common.

*Rumex Wallichianus*. Base of mountains.

*Rungia parviflora*.

*Peristrophe speciosa*.

*Lepidagathis* ———.

*Porana racemosa*.

*Periploca* (*Streptocaulon*) *calophylla*.

*Loranthus scurrula*, W. and A.

*Plectranthus rugosus*. To 6500.

*Salvia plebeia*.

*Ajuga remota*, (*lobata*? Don) common along the base of the mountains.

*Verbena officinalis*.

*Lantana dubia*, quite common from the forests of the Bhabur to about 3500 feet an undoubted native.

*Gynura nepalensis*.

*Blumea alata*.

*Conyza polyccephala*. (Edgeworth.) To Hurdwar.

*Sonchus arvensis*. To Kalaputthur.

*Youngia runcinata*.

*Apotaxis cirsioides*, common in cultivation to 3000 feet. *Carduus lanata*. Roxb.?

*Sauromatum punctatum*.

\* To the vegetation of Nynee Tal add *Urtica scripta*, Don.



*Sagenia coadunata*.

Below Kaleedhoongee, *Calotropis Hamiltonii*, which I had not noticed, was found by Mr. Edgeworth, but *C. gigantea* is by far the most common: at Hurdwar, 80 or 90 miles, N. W. the former is the only species.

*Acacia "Kureo,"* of p. 374, appears to be *A. elata*.

Kotah Doon, p. 379.

*Ficus cordifolia*? "*Gujeeoon*." Known in Gurhwal as the "*Kabur*;" it is I think, the tree called Peepul in Goojrat, where *F. religiosa* is "*Peepala*." The *Gujeeoon* may be *F. Tsiela*, Roxburgh's next species to *cordifolia*.

*Pterospermum suberifolium*. "*Moochkoonda*." At Gintee village, but no doubt an exotic.

*Elæagnus conferta*.

*Zeuxine sulcata*.

*Plectranthus Coetsa*. To 2200 feet at Kotah, and also in the Dehra Doon, by water courses; it differs somewhat from the normal form, usual at 4000—8000 feet; but less so than the plant which we find at 11,000, which is pronounced identical. The wild goat is very fond of this last variety.

*Thalictrum foliolosum*.

*Trochostigma*. A large semi-scandent shrub occurs in the forests along the base of the mountains in this neighbourhood, as well as along the whole line from Rikhikes on the Ganges to Burmdeo on the Kalee, and up the Surjoo to Kupkot. Flowers in May.

*Tetranthera monopetala*. "*Kutmura*." "*Singrow*."

*Harina oblongifolia*. The Buliya Glen above Bumouree is *not* its N. W. limit; Lieutenant Strachey obtained specimens between Kotah and Nynsee Tal; and I have myself since found it growing luxuriantly in Gurhwal on the Aonla Boonga Pass, between the Patlee Doon and Kala-khan on the Ramgunga. The people there (few and far between) did not know the plant, nor did it occur onwards in the Hurdwar direction; the Patlee Doon may therefore be safely considered its boundary. *Symplocos racemosa* reaches to within a few miles of Hurdwar.

*Abrus*, p. 381. This species also grows on the hills east of the Patlee Doon, and below Bheemtal, but sparingly in both localities.

Polgurh (properly Puwulgurh) p. 376.

*Medicago hystrix*.

*Buchanania latifolia*.

*Schrebera Swietenoides*. “Moka.” This tree occurs near Polgurh in considerable numbers, scattered in the Sal forest which clothes the high southern bank of the Dubka; a small hamlet below is named Mokanee from it. Lieutenant Strachey discovered the tree in this locality; I had previously met one or two in the Dhikolee Pass, but, wanting flowers and fruit, could only conjecture it to be a *Bignonia*, of which, and *Swietenia* (Mahogany) it has entirely the habit. It has not occurred elsewhere, and being tomentose, may possibly be different from Roxburgh’s species; but Mr. Edgeworth informs me that the foliage, &c., is similarly clothed in Bundelkhund; where it is called *Ghant*. The Kumaoon name is used in the Peninsula, and is evidently derived from the classical *moksh*, *moovku*, in allusion to the *pendulous* fruit, as the synonymes *Ghunta-patulee* and *Ghunta-parulee* (*Bell-Bignonia suaveolens*) refer to its form; and *Kshardroo* to the *ashy* color of the fruit and bark. Dr. Wilson does not give any identification of these terms; nor does Dr. Lindley notice Roxburgh’s genus.

*Seetabun*, p. 383.

*Crotolaria neglecta*. To Rikhikes in the Dehra Doon.

*Trewia nudiflora*, common in the Dehra Doon.

*Sabia paniculata*. Sansadhara in ditto.

*Scutellaria repens*.

*Gentiana aprica* (*decemfida*, Don.) Damp shady banks.

Mohan, p. 386.

*Hemiadelphis polysperma*.

*Polygonum glabrum* and *barbatum*.

*Mazus rugosus*. To Hurdwar; and to 7400 feet, Binsur.

*Nepeta graciliflora*, ditto.

*Ficus laminosa*, *Kosilla*, Dhikolee Pass, and every similar spot on to the Ganges at Tupoobun.

Chilkiya, p. 388.

*Gwatteria Korinti*, (at Gybwa.)

*Trophis aspera*, “Roosa”

*Rubus distans*.

In the market here, the fronds of *Adiantum capillus veneris* and

venustum are sold in considerable quantities under the name of *Huns-raj* (Toolsee in the hills,) being used as a dye.

At pp. 392, 441, 442, some confusion has crept into the enumeration of some of the species of *Sinapis*, which will be best cleared up by a simple statement of their corrected names.

*Sinapis dichotoma*, "Juria," "Judia," also "Luhota" and "Lyhta" in the Bhabur; "Kalee-surson" of Northern India.

*Sinapis glauca*, Roxb. "Rara," "Rada." "Bunga-surson" of Seharunpoor and the Dehrah Doon. "Peela, Peora (i. e., yellow and usl Surson, and often "Surson" simply, of Oude and Rohilkhund. The Kumaoon plant is exceedingly like *Brassica Napus*, grown from European seed.

*Sinapis glauca*. Royle, and Edgeworth, account of protected Sikh States: not noticed in the *Flora Indica*. "Dyn," "Daeen," "Lae" of Kumaoon and Gurhwal: sometimes "Khetiya," "Toree" and "Tor-ria," (s. *tuvria*, pungent) of northern India, where this variety or species is in general cultivation, including the Himalaya up to the villages of Joohar, at 11,000 feet elevation.

The "Teera" from Benares, p. 392, is the "Raee" and "Mukura Raee" of p. 442; its specific name is still unknown to me.

Huldwanee, pp. 395—399.

*Saccharum Sara* or *Munja*. The lower half of the culm is called *sentha* and *serput*; the upper half, *sirkee moonj*; rope is made from the leaf-sheaths. From Sir William Jones' expressions, it would appear that *munja* is simply the culm of *S. sara*: "from the *moonja* or culm of the *Sara* was made the *maunji*, or holy thread, ordered by Menu to form the sacerdotal girdle, in preference even to the cusa grass." The plant generally called Moonj is abundant along the banks of the Ganges at Hurdwar, and generally along the base of the mountains and up the vallies to 3500 feet; the brahminical thread called *juneo*, when first worn, is still formed of its fibre: and in connection with the constant use of the culm for arrows, may originally have represented the bowstring. It agrees best with Roxburgh's *S. Munja*, and at Hurdwar and in Gurhwal, is still commonly known by the Sanskrit term *surkura*,—the origin of *sugar* in every language: the root being *sri*, to hurt. The application is not very clear, till we recollect the resemblance of the sugar-cane to *Saccharum Munja*, and the arrow-

shafts (*sura*) furnished by the latter : the weapon, therefore, preceded the luxury. The Sat or Kilk reed-pen is the culm of *Saccharum fuscum*, not *S. Semidecumbens*.

*Arundo*? *Khyla*. This reed is very common in Gurhwal, where also it is considered poisonous to cattle, and has the name of "Bichhra."

*Imperata cylindrica*. "Shiro," ascends to 7500 feet.

*Saccolabium papillosum* (*Cymbidium præmorsum* of Roxburgh) is the orchid which covers *Ulmus integrifolia*.

*Plectranthus ternifolia* : common in the grass Bhabur, and up the great vallies to 3500 feet.

*Stipularia flaccida*, (*Arenaria flaccida* of Roxburgh, who notes its resemblance to *Spergula arvensis*,) is abundant in the rubbee cultivation of the Bhabur.

*Albizzia* (*Acacia*) *stipulata* ; common in the forests of the outer ranges.

*Flemingia strobilifera* : open forests of the Bhabur.

*Sephalica*, p. 398. Neither *Vitex* nor *Nyctanthes* supplying the requisite conditions, a final attempt to identify the plant will be admitted. In Ward's View of the Hindoos, Poetry, part 3, Vol. II. 381, we have the following passage in an address to the "Koomoodu, which expands its flowers only in the night." "Thou dost not shew even thy face to the sun, yet thou renoucest not the bee (who lodges in thy bosom all night.") Here, then, is a fact, real or poetical, involving the etymology of the term in question. Now Roxburgh (II. 577,) has Koomooda as the Sanskrit name of *Nymphœa Lotus* (*pubescens*) with white flowers, but the synonyme *Neelica*, as well as the *Umurkosh*, quoted by Sir W. Jones, implies that *blue* is the usual color : "When the *Sephalica* has white flowers, it is named *Swetasurasa* and *Bhutavesi*." (*As. Res.* IV. 258.) The probability therefore is that *Nymphœa cyanea* with "flowers beautifully azure," (Sir W. Jones,) or the blue variety of *Nelumbium speciosum* reported to exist in Cashmeer, is the plant originally intended. Sir William explains Koomooda to signify "Delight of the waters," which, though applicable to any beautiful aquatic plant, he would refer to *Menyanthes* (*Villarsia*) *indica* ; and we find *M. cristata* with "Koomoodwutee," "Koomoodinee," as its names, in the *Flora Indica*. The curled petals, and long white filaments of the corolla and nectary of these white-flowering plants, are



exactly such as the mountaineers of the Himalaya still designate by some term compounded of *Bhoot*, a goblin, a spirit : *Bhootkes*, "ghost's hair," being applied to several plants with finely cleft leaves and flowers, or furnished with copious long tomentum. *Swetasurasa* may denote "like a white angel;" but Dr. Wilson says, "White Rasan," *Ophioriza mangos*, to which it is compared; a plant I am not acquainted with, nor is it certain that *Rasna* is properly so rendered. The synonyms of the *Umurkosh*, not at present within my reach, might tend to establish this identification; but, right or wrong, *Nyctanthes* is clearly excluded, being never blue: the Kumaon pundits all consider it to be the "*Parijat*," pared down to mundane attributes; in color of flower it comes near the *Villarsias*.

Several trees are to be found in the Sewalik and Bhabur of Gurhwal which have not hitherto been met with in Kumaon.

Such are *Pongamia glabra*, *Boswellia glabra*, *Cochlospermum gossypium*, *Feronia elephantum* and *Limonia crenulata*; the last suddenly makes its appearance in great abundance a few miles S. E. of Laldhang: some of the others would not be recognized, being leafless all the cold weather. *Batis spinosa* (or *aurantiaca*?) the "*Kangoo*" and "*Manda*," of the Dehrah Doon, I have not seen S. E. of the Ganges. It has a fruit the size of a small custard-apple, repening in November, and not unlike the *Maclura aurantiaca* or Osage orange; while Roxburgh describes his with fruit the size of a pea. The natives of the plains generally mistake the Doon shrub for *Flacourtia cataphracta*, and call it *Puniyala* and *Puchnala*.

*Bheemtal*, p. 403, 404.

*Urtica* (not *Boehmeria*) *frutescens*, "*Poe*," "*Phoosur puta*;" it comes near *Urtica pulcherrima* of Roxburgh, and is common to the Ganges in Lower Gurhwal, where it is called "*Dhoula Kagshee*;" the "*Pooah*" of Nepal and Sikhim (also at p. 587.) *Vide Journal Agri. and Hort. Soc. Bengal*, Vol. VI. p. 135.

*Hedera elata*? tree of 30 feet, *Sat Tal*.

*Hedera terebinthacea* (not *parasitica*: and also p. 352.)

*Casearia tomentosa*.

*Sabia paniculata* (not *campanulata*, which has *purple*, not *green* flowers, as represented by Dr. Wallich; it is very common in Kumaon: the drupes when ripe are of an ultra-marine blue.

*Biophytum sensitivum*, to 3500 feet.

*Commelyna Donii*.

*Uraria lagopus*.

*Pueraria tuberosa*, to 4500.

*Wendlandia puberula*.

*Sapindus acuminatus*.

*Clematis Gouriana*, to 4500.

*Adiantum lunulatum*.

*Dalbergia Ougeinensis*. To 5000 feet, and far up the great vallies. The Vernacular Sanun,\* Sandun, Sunduni, &c., universally employed in the Bengal Presidency, are from the Sanskrit "Syundun," "Syunduni," "Syundan-droom,"—"tree of the war-chariot," indicating the use formerly made of the timber, which would probably be found an excellent material for the spokes and felloes of wheels, &c. It is still in high estimation in Kumaon, and many parties may be seen returning from their annual visit to the Bhabur with a small supply for their ploughs, &c.

The lake at Bheem Tal is 64 feet deep. (*As. Res. XIII.* 309.)

The following grow in or by it, in addition to those enumerated at p. 406:—

*Vallisneria spiralis*.

*Ænanthe stolonifera*.

\* *Balanites Ægyptiaca*. The vernacular names indicate the Sanscrit Hingoo-putree and Hingoo-purnee, "asafoetida leaf." I do not recollect the odour of the leaf, but "the pulp of the fruit has an offensive greasy smell." (Roxburgh.)

One or two more identifications of the vernacular with the classical may be added.

"Talisputra," "Mountain-leaf." A leaf used in medicine (Wilson) is probably *Rhododendron anthopogon*, well known to the mountaineers of Busehur as "Talsir." The leaves are much more aromatic than those of *R. lepidotum*, to which Dr. Royle refers "Taleesfur." "Chora," (*Wilson's Dictionary*.) Traill in *As. Res.* XVII. 9, is the ordinary term in Busehur and Gurhwal for Mr. Edgeworth's *Angelica glauca*; "Gundhrain" in Kumaon, and "Cheepee" of the Bhotias.

"Chumpa" is referred by Dr. Wilson to *Bauhinia variegata*, but is more probably *Michelia Kisopa*, *Doltsopa*, &c. which, with several *Magnolias*, are called Champ in Nepal and Sikhim.

"Toong," *Rottlera tinctoria*, according to Wilson, but in the British Himalaya universally used for *Rhus velutina* and *parviflora*.

*Pontedera vaginalis*, and at 5700 near Shamkhet.

*Potamogeton natans*, *perfoliatum*, *pectinatum*.

The plant which is entered *Scirpus lacustris*, grows 10 feet high, flowers in May, and is not to be distinguished from the English Bull-rush.

Shamkhet valley, p. 408. Here at 5500 feet, we have

*Thalictrum rupestre*.

*Michelia kisopa*.

*Hydrocotyle tenella* (*Nepalensis*.)

*Jasminum chrysanthemum*.

*Desmodium polycarpum*.

*Euphorbia hirsuta*.

*Potentilla nepalensis* and *splendens*.

*Rubus rotundifolius* (*Goureephul*), and an unknown species allied to it, but very green and glossy ; in shade only, to 7300, Gagur Pass, Binsur ; *affinis* provisionally, from its resemblance to *R. Goureephul* and *Wallichianus*.

*Agrimonia nepalensis*.

*Silene inflata*.

*Geranium Wallichianum*.

*Cedrela serrata*.

*Evonymus tingens* and *Hamiltoniana*.

*Ilex diphylla*.

*Viburnum cylindricum*.

*Sedum multicaule*.

*Primula denticulata* and *speciosa*.

*Lysimachia debilis*.

*Androsace sarmentosa*.

*Elsholtzia polystachya*. } Scarcely under 7000 ft. at Simlah.

*Senecio spectabilis*. }

*Echenais arachnoidea*.

*Barkhausia aspera*, at p. 434, this is erroneously marked *N. S.* ; it is the European plant, and is pretty common in cornfields and waste lands from this level to about 7500.

*Tulipa stellata*, at Sireenugur in Gurhwal ; this plant descends to 1800 feet ; the elevation of the Chirapanee Pass, estimated at 7000 feet, p. 578, is exaggerated ; the actual height by barometer is 6454.

Gagur Pass, p. 411.

*Rubus affinis* (Mihi) and another, unknown.

*Crassula indica* (not *sempervivum*.) Common at Simlah.

*Acar lævigatum*, common here; also on Binsur, and at Udwanee in Gurhwal.

*Viscum verticelliflorum*, on *Quercus incana*, to 7500.

*Loranthus vestitus*.

*Hypericum perforatum*.

*Symplocos nervosa*, (probably *S. sumuntia* of Don's *Prodromus*, and *S. lucida* of J. A. S. April 1833.) A small evergreen tree, common on the north side of the Pass, and in similar shady places on Binsur, Boora Pinnath, &c., and Punjok Khal in Gurhwal, from 6000 to 8000 feet. The leaves are beautifully glossy. *S. Loha* grows on Siyahee Devee.

*Lysimachia debilis*.

*Hedyotis Lindleyana*.

*Gardnera ovata*.

*Bryum serpyllifolium*.

*Dolichos glutinosus*, (nearly) at 6000 feet.

Ramgur valley, p. 416.

*Barleria cristata*.

*Verbena officinalis*. This may be adduced as another instance (p. 356) of an European species limited to the warmer region of the Himalaya, from 2000 to 7000 feet, so far as I have observed it. So we have *Geranium molle* in great abundance, associated with *Acacia Catechu*, at 1200—1500 feet, along the Ganges between Tupoobun and Deopryag, flowering in February.

Deodara Pass, p. 415.

*Buddlea crispa*, "Doosheria." The shrub so named, common everywhere from Busehur to Kumaon, at 5000 to 7500 feet, appears to be *B. paniculata* of Wallich (*Flora Indica*, I. 412) and Don, (*Prodromus*), *B. tomentosa* of Hamilton.

*Salix*, an arborescent species is common here between 5500 and 6500 feet, and in many similar shady localities in the province; it is diandrous, polyspermous (often 5,) with lanceolate leaves, glaucous and sericeous beneath. It is probably *S. cuspidata*, Don. *S. tetrasperma* fringes the Ramgur stream fully up to 5000 feet.

Peoorah, p. 416.



*Viburnum cylindricum*.

*Disporum Pitsutum*, common also on Binsur, Siyahee, Boora Pinath and Fagoo.

The "Neoula" mentioned at p. 420, is *Bucco grandis*. The story goes that its lamentable cry is the expression of its feelings on the loss of a awsuit! The loud bell-note of another species (*B. caniceps*) is equally remarkable in the forests of the Bhabur. The cause of the Singor (*Athene Brodiei*), and generally of the owl family, making their appearance only by night, is explained in Kumaon by the legend, that having originally none of their own, they dressed themselves in plumes borrowed from all their neighbours; but repudiating this loan, are invariably chased and beaten by these latter whenever they venture abroad in the day time!

Almorah, pp. 423—445.

*Clematis gracilis*, Edgeworth, at 7500 feet on Binsur.

*Diclytra scandens*. Found at Bala Jagesur by Lieut. Strachey, at Mussooree by Mr. Edgeworth.

*Corydalis paniculata*, 3700 feet, is a misprint for 7300.

*Jasminum dichotomum*. Don. Bhyns Khet, near Hawulbagh, probably *J. angustifolium*, Roxb.

*Ænanthe stolonifera*, (on the Suwal.)

*Ptychotis anethifolia*. "Dhunjurree."

*Hedera parasitica*. Binsur, at 7400 feet :—on *Rhododendron*.

*Hedera terebinthacea*. Kosilla.

*Ænothera grandiflora*, (not *longiflora*.)

*Berberis nepalensis*, "Chotura." In great abundance on Binsur\* from 7000 to 8000 feet. The "Jumne Mundroo" of Kirkpatrick's Nepal.

*Polygala Rothiana*.

*Juglans regia*, "Ukhor," a few trees wild on Binsur at 7500.

*Euphorbia angustifolia* (*dracunculoides*, Roxb.) From the Bhabur forests to 6000 feet; about which point it is succeeded by *E. hirsuta*.

\* A few plants, not met with elsewhere in the vicinity of Almorah, will be found referred to this mountain, a very fine one, close on 8000 feet elevation, about 12 miles from that station to the N. E. It separates the smaller affluents of the Kosilla from those of the Surjoo. There are several Binsurs and Binesurs in Gurhwal, all sacred to Mahadeva, probably as Bindh-eswur, "Lord of the Vindhya;" or Binaik-eswur, which is equivalent to Baal-peor.

*Leptopus* (*Phyllanthus*) *cordifolius*. (Cluytia of p. 426.)

*Silene conoidea*, abundant in the cornfields.

*Melianthus major*. A solitary plant of what seems to be this species has existed from time immemorial in the Government Tea Plantation, Hawulbagh, formerly the property of Sir Robert Colquhoun, from whom Dr. Wallich received a portion of his Kumaon specimens, and who has been accordingly commemorated by a genus of the Labiatae. In Dr. Royle's Illustrations, p. 154, we are told that the Doctor's plant collectors obtained a species of *Melianthus* on "the lofty mountains of Kumaon," and Dr. Lindley (*Vegetable Kingdom*) apparently alludes to this circumstance when he says that *Melianthus* is remarkable for being found both at the Cape of Good Hope and in Nepal without any intermediate station." (Dr. Royle, Illustrations, p. 25, mentions it as a plant not found in *Nepal*.) Now, a considerable number of these lofty mountains of Kumaon have been explored by Lieut. Strachey, Mr. Winterbottom, and myself, and we could scarcely have missed so conspicuous a shrub if it existed in any of the localities visited. So far therefore, as this negative evidence is of value, added to the probability of the Hawulbagh plant being one of the Cape species, introduced from Calcutta or Seharunpoor, the anomaly of geographical distribution is explained and removed. The Hawulbagh species has never flowered recently, and may be new, introduced from our lofty mountains; or it may be *M. major*, and quite unconnected with the specimens alluded to by Dr. Royle, but the presence with it of pear, apple, plum, and other fruit trees, and flowering shrubs, manifestly from some Botanic Garden in the plains, with the absence of all specification as to the site of Dr. Wallich's specimens, is suspicious; and "plant-collectors" are glad enough to load their Herbaria with garden specimens, and for the most part not enthusiastic at all in exploring "lofty mountains." About 3 years since *M. minor* was in flower in General Tapp's garden at Subathoo; and *Ulex Europæus* at Simlah; where his (native) gardener assured me the latter was from the interior. Both were undoubted exotics, introduced by the General. Dr. Wallich's collectors may have supposed the Hawulbagh *Melianthus*—if this be *M. major*, and supplied the specimens in question—to be indigenous; the question can only be set at rest by a comparison of these with authentic ones of the Cape plant. That the identical species should occur in both countries

is extremely unlikely ; the Himalaya having otherwise only one representative of the order as defined by Dr. Lindley ; viz., a species of tribulus, found and figured at Leeo in upper Koonawur, by Mr. Charles Horne, C. S.\* It should be added however, that Mr. Wm. Griffith (Journal of Travels, pp. 264, 265) mentions a *Melanthus* at 9500 feet near Jaisa, in northern Bhotan.

*Zizyphus jujuba*.

*Reseda odorata*. Becomes perennial at Almorah as at Algiers.

*Rubus tiliaceus*. "Kutrola," "Kutrota:" (*R. cordifolius*, Don.)

*Potentilla supina*, at 7400, on Binsur, and at Hurdwar.

*Potentilla Wallichiana* ; a third species is undetermined.

*Indigofera polyphylla*.

*Flemingia nana* ? Roxburgh ; a small shrub, 3 to 5 inches high. Almorah.

*Flemingia procumbens*, Roxburgh, is no doubt the plant formerly entered here as *Dolichos*, "Mooskela." It is so called (mouse-plantain) from the form of its tubers, which are occasionally dug up and eaten by the poor. The plant reaches nearly to the summit of Luriya Kanta, and to 8500 feet, or more, near Nagkunda. I have not seen the deciduous calyx bracteoles mentioned by Roxburgh, and one of the two ovules seems generally abortive.

*Eriosema* ———. This is *Crotolaria tuberosa* of Don, *Pyrrhotrichia tuberosa*, W. and A.

*Urtica caudigera*.

*Ficus virgata*, (not *rotundifolia*.) "Beroo," "Bedoo." It is arborescent with ashy white bark and edible fruit, the size of a large gooseberry ; and so far does not tally with Roxburgh's description.

*Aerua scandens* (not *lanata*.)

*Polygonum Posumbu* (Don.) near *P. barbatum*.

*Stephania Wightii*. Clypea of p. 431.

*Campanula canescens* (not *ramulosa*.)

\* In Mr. Horne's numerous and interesting drawings may also be recognized three other plants new to Himalayan Botany :—

1. *A Symphytum*, at Bhyroo Ghattee on the Bhagiruthee.
2. *Calystegia sepium*, at Reebe in upper Koonawur.
3. *Tamus* (like *Cretica*) at Rukchum on the upper Buspa.

*Campanula agrestis*. Wallich, Kosilla and Suwal at 4000.

*Oreoseris gossypina* (not *lanuginosa*.)

*Spermacoce lasiocarpa* (not *stricta*: but very like it.)

*Cyathocline lyrata*: *Tanacetum purpureum*. Don's Prod.

*Inula vestita*, rare and dwarfed.

*Blumea interrupta*; N. S., extremely fragrant.

*Erigeron Roylei* (not *Aster bellidifolia*.) "Murch-mool."

*Amphirapis pubescens* (*Solidago Nepalensis*, Don.)

*Bidens Wallichiana*. The species so named here, may possibly be new: *B. gigantea*, as it is from 6 to 8 feet high near Bagesur; occurs from the base of the mountains to 7500.

*Tricholepis elongata*: (not *reticulata*.)

*Thesium Himalense*, (Royle,) common at 6500 feet on Binsur.

*Ixeris hastata*. Binsur, 7500. Common at Lohba House, Gurhwal, 5500.

*Galium ciliatum*, Don. Binsur, 7300.

*Dipsacus inermis*.

*Mæsa argentea*. "Phoosera." 5500. Western glens of Binsur. Fruit edible.

*Cynoglossum prostratum*, Don.

*Orthosiphon virgatus*. Common on the Kosilla.

*Leucas hyssopifolia*, (not *Indica*.)

*Zapania nodiflora*, to 4500.

*Premna herbacea*, (not *barbata*.)

*Linaria ramossima*, (not *incana*.)

*Wulfenia Amherstiana*. Common on Binsur at 7000 to 7500.

*Scrophularia obtusa*, N. S. near *auriculata*, p. 435.

*Leptorhabdos* (*Sopubia*) *parviflora*. Binsur, 6500.

*Sopubia scabra* v. *trifida*, (not *Gerardia delphinifolia*.) Common on warm grassy slopes at 6000—6500, from Simlah to Almorah.

*Pergularia pallida*. Kosilla, at 4000.

*Crinum toxicarium*. "Chundur-Kouwul" of p. 437.

*Phoenix humilis*? on very warm aspects this, in a very dwarfed state, reaches 7000 feet on Binsur. The fruit ripens at Almorah in July, and is then of a black, purple color. What little pulp there is, is sweet and the dates are eaten by the poor. In their color, that of the spadix, and minor points, the fructification bears a



very close resemblance to *Phoenix Sylvestris*, as described by Dr. Griffith, (Calcutta Journal of Nat. Hist. No. 19,) who was evidently inclined to consider this last, *Ph. acaulis*, and *Ph. dactylifera* but as gradations of one form.—Such a view seems very probable from the apparent impossibility of finding good characters to define these so called species.

*Uropetalum*. So Mr. Edgeworth thinks the blank may be filled up, line 7, p. 438.

*Juncus dichotomus* (not *bufonius*.)

\**Commelyna salicifolia*.

*Remusatia capillifera* (not *vivipara*.) See ante.

*Pothos decursiva*? “*Kelounia*.” A very handsome species, at about 4000 feet, east face of Binsur.

*Andropogon Calamus-aromaticus* (or *Martini*.) This plant is called *Rhoonsee* in central India, and it is curious that at Syree (below Simlah) where it is abundant, the name is “*Reoonsh*,” and “*Dig-reoonsh*.”

*Anthisteria arundinacea* to 4000 on the Suwal.

*Manisurus granulatus*.

*Leptothrium Roylei*.

*Pogonanthum polystachyum*.

*Spodiopogon laniger*.

*Brachypodium Nepalense*.

*Fimbristylis communis*.

*Mariscus cyperinus*.

*Trichelostylis junciformis*.

*Kyllingia multiceps*.

*Cyperus Iria*.

*Cyperus tegetum*. (*Papyrus pangorei*?) is the plant entered as “*Motha*,” p. 440. It occurs wild, but is also cultivated on the bor-

\* In the original paper, *Murdannia scapiflora* is inserted here, I suspect erroneously. The plant intended scarcely descends below 5000 feet; flowers in August with leafy scape, and is probably *Aneilema longifolia*. It is common along the Gagur range, up to 7000 feet, and is also found at Simlah and Mussoree. *Murdannia scapiflora*, on the other hand, flowers in May with a leafless scape, and does not, to my knowledge, ascend above 4000 feet, as at the Sat Tal, near Bheem Tal. The flowers are very like, and Dr. Royle (Illustrations, p. 403,) appears to consider the plants identical.

ders of inundated fields for the sake of the very durable mats made of its culms.

*Botrychium lanuginosum.*

*Sinapis*, pp. 441, 442. Vide corrections ante, p. 619.

*Amaranthus farinaceus*, (not *anardana*.)

*Amaranthus caudatus* (not *speciosus*.)

*Cucurbita citrullus*, "Turbooz." Not common.

*Dolichos sinensis*, "Lohbia." Gardens. During powerful sunshine, the leaflets of *D. catjang* may be observed in motion much like that of *Desmodium gyrans*.

*Soja hispida*, "Bhut." This pulse, though reckoned unwholesome, and only consumed by the poorest classes, is extensively grown in Kumaon, and is evidently of old standing, as many leguminous shrubs; *Desmodium*, &c., take their names "Bhutola," from it, as others, "Guhutya," from *Dolichos uniflorus*. The cultivation of *Soja* extends, I am assured, to Nepal and the north of Tirhoot, under the name of "Bhutnas" or "Bhutwas;" a circumstance not noted in our books on their agriculture.

P. 448, *Acacia dumosa*. This shrub, or small tree, not observed elsewhere in Kumaon, is common in Gurhwal up to the Ganges, and appears to be confined to the banks of the streams and rivers where they enter the plains and Doons. It is generally known by the same names, Keekur and Bubool, as *A. arabica*. The pinnæ are 3—5, the leaflets 4—10; glands various, and in its young branches, petioles, thorns, very villous with rufous down. It disagrees with the account in W. and A.'s *Prodromus*. The flowers are white, probably in December or January; it is in young fruit in February. The peduncles solitary or in pairs, equal to, or twice as long as the leaves, with umbel of 3—7 legumes; 5—8 seeded, flat, smooth, linear, nearly straight, pendulous, 3—5 inches long, by less than a quarter of an inch broad; the border with a long shallow sinus between each seed. This form seems the main difference from *A. latronum*.

Burmdeo and Poonagiri, p. 571.

*Wendlandia puberula*.

*Bambusa stricta*, Roxb. is the common species of the Turaee and lower mountains.

*Briedelia scandens*, reaches the Suniya jungles.

Chhirrapanee, p. 578.

*Eria convallarioides* (*Octomeria spicata*, Don.) “Guroor-punja,” it abounds in Kumaon on *Quercus incana* up to 7500 feet.

*Androsace sarmentosa*, not *lanuginosa*, is the plant which occurs here, and in all equivalent localities. *A. lanuginosa* is found at great heights along the snowy range from Busehur to Kumaon. Each plant is sarmentose and woolly, and Don has confounded them.

Ramesur, p. 586.

*Saurawja nepalensis* : bis, p. 589. *Sauravia* is a misprint.

*Cantharospermum*, a great climber, with yellow flowers in February, March, occurs here and in the forests of the Bhabur to Hurdwar.

Gungolee Bridge, p. 587.

*Wendlandia exserta*, var.

*Pittosporum floribundum*.

*Lysionotus serratus* (or *ternifolius*), a common shrub on the Surjoo nearly up to Kupkot.

*Evonymus virgatus*, N. S.

*Ceanothus micropetalus*, N. S.

*Ocotea lanceolaria*.

*Tetranthera Roxburghii*. “Gur-beejour;” from some resemblance of its leaves to those of the citron.

*Urtica frutescens* (not *Boehmeria tenacissima*.)

*Blumea laciniata*, vel N. S. *procera*.

*Rhabdia sericea* (Edgeworth.) This shrub, which is procumbent, with stems as thick as one’s wrist, and 5 to 6 feet long, abounds in the bed of the Surjoo from this spot to the junction of the Reethagar stream, abreast of Binsur, and probably considerably farther in each direction. Mr. Edgeworth, about the same time, discovered another species in the Cane river near Banda, the genus being previously unknown in India.

*Acacia Smithiana*.

*Hymenodictyon flaccidum*.

*Indigofera trita*.

*Desmodium reniforme*.

*Geniosporum strobiliferum*.

} By Lieutenant Strachey.

The “Roogee” mentioned at p. 588, is not an *Actæa*, but belongs to an order intermediate between *Cruciferae* and *Papaveraceae*; and to a

genus which Mr. Edgeworth proposes to name "Stracheya," after Messrs. John and Richard Strachey, who first discovered the plant near the sources of the Pindur. It is not uncommon at similar altitudes (12000 feet) on the Gauree to the eastward; and Mr. Winterbottom found it, or a very similar species, on the lofty passes between Kashmir and little Tibet. Raised from seed or imported mature from the Himalaya, it speedily perishes at Almorah.

P. 590. *Rhynchosia pseudo-cajan*. "Shiale," "Phoosur-puta."

P. 595. *Chamærops*. The actual stature of this Palm on Thakil mountain is here considerably underrated. In December 1848, Mr. Winterbottom, without searching out the loftiest trees, measured one, the bole of which was 46 feet, 4 inches, with a crown of perhaps  $3\frac{1}{2}$  feet more; another stem was  $36\frac{1}{2}$  feet, and no doubt some attain 50. Mr. W. was fortunate enough to visit the spot when these Palms were covered with snow. Dr. Hoffmeister mentions this *Chamærops* on Dhunpoor in Gurhwal.

P. 607. The bitter *Olea* mentioned here is probably *O. compacta*; it is common by brooks in the warmer vallies of Kumaoon and Kyoonthul, (Simlah.)

*Clematis montana*. This species is abundant in Kumaoon and Gurhwal at 6500 to 7000 feet, where it apparently disappears, but only to be replaced by what may be considered a variety, becoming however, more and more luxuriant till, at 8000 feet, Fagoo woods, and 10,000 feet elevation on Doodootolee mountain in Gurhwal, and others in Kumaoon, it attains its maximum, climbing 20 to 30 feet up *Abies Webbiana*, which it covers with sheets of large blossoms, of the purest white, with the fragrance of Meadow-sweet; variety or species, it is the handsomest of the genus.

Near Somesur, p. 610.

*Mimulus gracilis*. By water-courses.

Boora-Pinnath, p. 614.

*Evonymus echinatus*, is the blank species; *E. japonicus* is now considered to be distinct, and is named by Dr. Wallich *pendulus*; a tree of 40 feet, with yellow bark like *E. tingens*.

*Vincetoxicum Kunawarensis*, 9000 feet.

*Orob. aurantiacus* (not *luteus*.)

*Pyrus vestita*. This is the tree which, at Diwalee, (J. A. S. March



1847, p. 246,) under the name of "Moulee" is named *P. crenata* : and Loudon (*Arboretum* II. 912,) is inclined to identify *crenata* of Don, with *vestita* of Wallich. The same name is applied to this species N. W. to Busehur, by the population immediately next the Himalaya, who, in all this tract, appear in many cases to have preserved the same, or but slightly modified names for the same plants ; from which may be inferred identity of race. In the lower provinces of the mountains, on the other hand, the case is very different; more open to invasion, though scarcely more worthy of it, the population has been more mixed, and the dialects so altered that very few of the vernacular terms for plants proper to Simlah are in use at Almorah.

P. 618. *Symplocos paniculata* (not *racemosa*, which does not appear to ascend the mountains.)

P. 625. *Ligustrum bracteolatum*, is a common shrub in the Sutralee valley, at 4500 feet, and follows the course of the streams up to 7500, on Binsur.

The subjoined errata of the press require correction :—

P.	350	L.	9	for	400	read	4000.
"	"	"	23	insert	comma	after	<i>Gagur</i> , period after <i>Chilkia</i> .
"	"	"	27	"	space	"	span.
"	360	"	6	for	fullest	read	falsest.
"	367	"	35	"	pointed	"	painted.
"	376	"	7	"	Tiaree	"	Jiaree.
"	411	"	31	"	barbatella	"	barbellata.
"	418	"	14	"	forms	"	ferns.
"	423	"	31	"	3700	"	7300.
"	434	"	24	"	Feewae.	"	Heewae.
"	437	"	10	"	2500	"	1500.
"	440	"	23	"	Tsolepis	"	Isolepis.
"	571	"	18.21	"	following	"	foaming.
"	572	"	16	"	deserted	"	desecrated.
"	577	"	last	"	Bunlouree	"	Bumouree.
"	599	"	27	"	and	"	or.
"	600	"	12	"	from	"	form.
"	602	"	1	"	crossing	"	cropping.
"	607	"	31	"	that	"	That ( <i>a village</i> .)
"	616	"	10	"	stories	"	stones.
"	618	"	21	"	Doonagiri	"	Poonagiri.

*Identification of the plants found by Major General Hardwick between Hurdwar, Kotdwara and Sreenugur, in the year 1796, as detailed in the sixth volume of the Asiatic Researches :—*

**MONANDRIA MONOGYNIA.**

*Costus speciosus.*

*Curcuma (angustifolia.)*

*Diandria monogynia.*

*Jasminum* 1, (*dichotomum* of Don, *angustifolium*, Roxb.)

*Jasminum* 2, (*arborescens.*)

*Jasminum* 3, (*chrysanthemum*, Roxburgh, and *revolutum*, Don : very probably also *J. inodorum* of Jacquemont ; *J. Jacquemontii*, Decaisne, and *J. chrysanthemoides* of Royle.) Hemapooshpika, Sanscrit, Sona-jahee, or Golden Jessamine of the Vernacular. It occurs from 5500 to 10,000 feet above the sea, and varies considerably in the size of the leaves, the position of the stamens, &c. The former, as well as the corolla, are ciliate.

It may be necessary to mention that the Udwanee mountain, where the General found this and so many more of his plants, is the highest range between Kotdwara and Sreenugur, being about 12 miles S. S. W. of the latter (direct distance) and 7151 feet above the sea, at Ranee-gurh, the Trigonometrical station.

*Justicia (Phlogacanthus) thyrsoiflorus.*

*Salvia integrifolia (lanata.)*

**TRIANDRIA MONOGYNIA.**

*Valeriana (Hardwickii.)*

**TETRANDRIA MONOGYNIA.**

*Ixora tomentosa.*

**PENTANDRIA MONOGYNIA.**

*Androsace rotundifolia.* (No doubt the General intends the perennial pink species flowering all the year : not Dr. Wallich's white flowering annual, *A. incisa*, which alone descends to the Turæe, flowering only in the cold season and spring. Don (Prodromus) confounds the two, and I believe that in Europe, the specific names are erroneously reversed.)

*Lonicera quinquelocularis*, (*diversifolia* of Wallich,) which never climbs. no other species grows near Udwanee, and this, except in wanting the 5-celled ovary, perfectly agrees with the combined character by Rox-

burgh and Hardwick : the General was inclined to identify his plant with Dr. Wallich's *L. ligustrina*, but may have intended the next species, *L. diversifolia*, procured from Gurhwal. The 5-celled berries would, taken alone, indicate *Leycesteria formosa*, but there the resemblance ceases ; and Dr. Wallich would at once have recognised that shrub in the General's drawing ; nor could I discover it anywhere in the Udwanee vallies, where *L. diversifolia* is abundant. The general may easily have mistaken the number of cells in a very immature berry, which, in that stage, much resembles a capsule, and has certainly at least 3 cells occasionally. Dr. Wallich's name being rather inappropriate, the shrub might be well called *Lonicera Hardwickii*.

*Verbascum Thapsus*.

*Datura stramonium* (alba.)

*Ehretia tinifolia* (serrata.)

*Ventilago* (maderaspatana.)

*Celastrus scandens* (nutans.)

*Celastrus* 2, (not identified : *C. montanus* or a species very like it, is common at such elevations, 4500 ft., all along the mountains.

*Cedrela* (Tuna.)

Doubtful genus coming near *Hirtella*, (probably *Embelia picta* : compare *Celastrus rufus*, Wallich )

*Vitis* (lanata.)

*Gardenia* (*Randia*) *uliginosa*.

*Gardenia* 2, (*Randia longispina*.)

*Gardenia* 3, (*Randia tetrasperma* : *G. densa*, Wall.) Both descriptions are of shrubs eaten down by goats : when uninjured, *R. tetrasperma* assumes a very different appearance, by no means dense, and 10—12 feet high. The flowers are *terminal*. It is probably *Gardenia rigida* of Don's *Prodromus*.

*Nerium* (*Cryptolepis*), *reticulata*.

*Nerium* 2, (*Wrightia mollissima*.)

*Echites antidysenterica*, (*Holarrhena pubescens*.)

Genus not determined, (*Evonymus tingens*.)

PENTANDRIA DIGYNIA.

*Apocynum*, (*Vallaris dichotoma*.)

*Asclepias*. Doubtful. (*Hoya viridiflora*.)

*Herniaria*. Doubtful. (*Deeringia celosioides*.)

*Gentiana nana*, (marginata.)

PENTANDRIA TRIGYNIA.

*Gouania nepalensis*, Wallich. The General's description is imperfect, and even erroneous, but from its abundance, there can be little doubt this is the shrub intended.

PENTANDRIA PENTAGYNIA.

*Linum trigynum*: shrubby, grows to be a spreading bush, about 4 feet high. Stem and branches erect. (This shrub is common everywhere from the base of the mountains to above 7500 feet, where it disappears. Except in the pale sulphur-yellow, and delicate fragrance of the flowers, it differs in no way from the shrub of our Indian gardens. Wight and Arnott suppose the Bengal and Nepal plant to be *L. repens* of Don, and so it is no doubt, the latter species being constituted solely from its appearance on the banks and terrace walls, where it is annually (with other shrubs) clipped down by the cultivators, as well as constantly nibbled by the cattle; the natural position is erect, and the height is sometimes 6 to 7 feet. Dr. Royle is inclined to consider *L. cicanoba* as a probable variety of *L. trigynum*, and Mr. Bentham to identify the last with *repens*: we have then only left, *L. tetragynum*, which is assuredly a mere accident; 5 or more styles being occasionally met with, either free or in various stages of cohesion up to the "semi-trigynum" of Hamilton.

HEXANDRIA MONOGYNIA.

*Berberis ilicifolia*, (identified by Roxburgh with his *B. asiatica*. From the Kali to the Bhagiruthi there is certainly no species which can be mistaken for it; and unless an abrupt change occurs at Mussooree, it is *B. lycium* of Royle. The latter however is well known there by the name "Kingora," which is also the designation of *B. asiatica* S. E. to the Nyar, where, as in Kumaon, Kilmora becomes the term used. *B. aristata* occur on Udwanee, but the General does not appear to have discriminated it.)

HEXANDRIA TRIGYNIA.

*Rumex Ægyptius* (Wallichianus), and *acetosella* (hastatus. The last occurs from the foot of the mountains to 8500 feet, and perhaps higher.)

OCTANDRIA MONOGYNIA.

*Polygonum convolvulus* (pterocarpum.)

ENNEANDRIA MONOGYNIA.



*Laurus cassia* (cinnamomum albiflorum.)

DECANDRIA MONOGYNIA.

*Bauhinia scandens* (Vahl.)

*Bauhinia variegata*.

*Guilandina moringa*, (*Moringa pterygosperma*.)

*Muraya exotica*.

*Melia azadirachta* (probably the Bukayun, not the Neem, is intended, the last is rare in the forests ; indeed I did not observe it at Kotdwara, where the Bukayun is common, though perhaps not wild. Notwithstanding all that Dr. Royle has written on the subject, it seems quite unnecessary to make the "Bukayun" a new species of *Melia* ; it agrees perfectly with the *Melia azedarach* of Roxburgh, Wight and Arnott, and Loudon's *Encyclopædia*, where the description of the drupes tallies with Dr. R.'s account (p. 141, Illustrations) of the Bukayun ; and certainly the tree of Provence, Egypt, &c., is no other ;—nor do the people of northern India generally (and apparently of Nepal) know of any other. Munshí Murdan Alí, of Seharunpoor, informs me that the "Dek" is a mere variety, only differing from the Bukayun by a more spreading habit, which gives less shade ; and one of the Seharunpoor gardeners now employed at Hawulbagh, on being asked what was the "Dek," pointed at once to the Bukayun, which I have heard termed "Dykna" in Gurhwal, and "Jek" near Simla. The size, as well as the form and number of the leaflets on each pinna of the Bukayun differ so considerably even on the same branch, as to remove any reliance on this kind of test ; and yet it so happens that Messrs. Weight and Arnott found Roxburgh's own specimens of *M. azedarach* and *sempervirens* so much alike as to appear as if cut from the same tree. "Dr. Roxburgh also states the *Bukayun* to be a native of Persia, though common throughout India, and that its Arabic name is *Ban*. This, in addition to the specimens in the East India Herbarium, perfectly identifies his plant with that of northern India." (Royle.) But the plant so named by Roxburgh is his *Melia sempervirens*, "a small, delicate, evergreen," which is certainly unknown in northern India, and, from the silence of W. and A. apparently equally so, in the south. Roxburgh found his plant to coincide with those raised from West Indian seed of *M. sempervirens*, which however, so far from being a small evergreen, is said in Loudon's *Encyclopædia*, to be a tree

of 40 feet, considered by some only a variety of the *azedarach*." Assuredly no tree is less entitled to the epithet of "*sempervirens*" than the *Bukayun*, which for 3 or 4 months annually, is the most marked of the deciduous trees of northern India. The same species may be evergreen in the damp and equable temperature of the West Indies; and, if we suppose Dr. Roxburgh to have made his descriptions from very young plants (which in many species are more or less evergreen,) his *M. sempervirens* may be accounted for. He states it to be "common throughout India," and to blossom more or less throughout the year, which is another difficulty, the *Bukayun* being very periodical, and flowering at Almorah, for example, in April, May or a month later than at Meerut.

I cannot find that Dr. Roxburgh identifies his *Melia azedarach* with the "*Dek*," as distinguished by Dr. Royle from the "*Bukayun*," nor that he had ever heard of such a tree. However, as Dr. Royle has done so; and as the *Bukayun* also answers to the description of *M. azedarach*, the only conclusion is that they are one and the same, which is the common opinion in northern India. The *Bukayun* is a smaller tree than the *Neem*, and as *muha* denotes *best, excellent*, as well as *great*, *muha-neem* must apply to its blossoms and their odor, rather than to its dimensions, possibly also to the extreme bitterness of the bark, an infusion of which is used in the mountains to expel leeches.

The expression "spreading tree" used by General Hardwick for the *Melia* of Kotdwara is exceedingly opposite to the *Bukayun*, and is an exact translation of the Persian "*Azad-i-durukht*," as well as of its Sanscrit equivalent, "*Nibundh*." The vernacular terms "*Bakarjun*" of Bengal, and "*Bukayun*" of Hindoostan, are to be traced in the Sanscrit roots *vuk*, *vuks*, bent, crooked (boughs,) and afford some proof that the tree is indigenous to India, but in Kumaon at least it never occurs to my knowledge but in spots near which it is likely to have been planted. The people, however, have their own name for it—"Betain." The fruit remains on the tree a full year, untouched by beast or bird excepting the *Bulbuls*, (*Ixos jocosus*,) who may be observed devouring it with avidity, and thus perhaps it has been scattered so far as to induce in some a belief that it is indigenous, as indeed it may be.)

Doubtful, (*Garuga pinnata*.)

Doubtful, (*Rhododendron puniceum*, Roxb. *arboreum*, auct.)

*Arbutus*, doubtful. (*Andromeda ovalifolia*, *Arbutus herpetica*, Roxb.)

DECANDRIA TRIGYNIA.

*Banisteria Bengalensis*. (*Hiptage madablota*.)

DECANDRIA PENTAGYNIA.

*Spondias myrobalanus* (*mangifera*.)

*Sedum album* (*adenotrichum*.)

*Oxalis acetosella*. On the heights of Chichooa, on a small spot of pasture. (Dr. Griffith found it near Tongsa in Bhotan; *Journals of Travels*, p. 268. Lieut. R. Strachey at Diwalee and other spots in northern Kumaoon; and I have lately seen it in abundance at Ludoolee Ghat, at 7000 feet elevation, on the S. W. face of Doodootolee mountain, 6 or 7 miles from the source of the Nyar river. It flowers in March and April, and is undistinguishable from the English wood-sorrel.)

*Cerastium alpinum*, (*triviale*.)

Doubtful, (*Dentzia staminea*, very like *D. scabra*.)

DODECANDRIA MONOGYNIA.

*Cratæva tapia*. (*Ægle marmelos* or *Cratæva nurvala*. Both occur, the first very common. *Grislea tomentosa*.)

DODECANDRIA TRIGYNIA.

*Euphorbia canariensis* (*pentagona*.)

ICOSANDRIA MONOGYNIA.

*Punica granatum*.

*Prunus*. (*Cerasus Pudum*, *Prunus sylvatica*, Roxb.)

ICOSANDRIA DIGYNIA.

*Cratægus*. (*Cotoneaster microphylla*, Roxburgh's *cratægus integrifolia*.)

ICOSANDRIA PENTAGYNIA.

*Pyrus* (*variolosa*.)

*Spiræa* (*chamædrifolia*.)

ICOSANDRIA POLYGYNIA.

*Rosa* (*Brunonis*.)

*Rubus* (*Gouree-phul*, Roxb., *rotundifolius*, Wall., *flavus*, Don. The name *Gouree-phul*, signifying claret-purple fruit, is only used in Gurhwal by the pilgrims from the plains to Budreenath, &c. The mountain name is "Heesura" or "Heesur" in Gurhwal, and, more correctly "Heesaloo" in Kumaoon and Ayshala in Nepal, according to Don, *Esealoo*, of

Aikin, from the Sanscrit *hinsaloo*, hurtful, mischievous. So, in northern India another thorny shrub, *Capparis sepiaria*, is called *Hins*, and *Heengs*, from the same root, *his*, to hurt. *Hinsuna*, *Abrus precatorius*, (Wilson) is therefore, perhaps, more properly *Capparis sepiaria*. *Heesaloo* is *R. rotundifolia* especially, the black, orange, and other species are descriminated as *Kulia*, *Jogia-heesaloo*, &c.

*Rubus idæus*, (identified by Roxburgh with his own *rosæflorus*, *distans*, Don ; *R. lasiocarpus*, Smith. If I am right in identifying it with *R. distans* of Don, it is the only species of Himalayan *Rubus* common to the plains and mountains, being found in the open country at Chilkiya, and as high as 7500 feet. *R. goureephul*, descends to, but does not quit the base of the mountains.)

*Fragaria sterilis* (indica, W. and A. very near *F. Malayana*, Roxb. but the peduncles are usually leaf opposed. It grows up to 8000 feet.)

*Potentilla fragarioides*, (a species common in Gurhwal and Kumaoon ; not determined, but near *P. Leschenaultiana*.)

*Potentilla reptans* (Wallichiana.)

POLYANDRIA MONOGYNIA.

*Lagerstroemia montana* (reginæ.)

Doubtful. (*Symplocos cratægoides*, *paniculata*, Wall.)

POLYANDRIA POLYGYNIA.

*Uvaria* (tomentosa.)

DIDYNAMIA GYMNOSPERMIA.

*Ballota* (*Roylea elegans*.)

DIDYNAMIA ANGIOSPERMIA.

*Bignonia chelonoides* (suaveolens.)

*Gmelina arborea*.

*Volkameria* ? *bicolor* (*Clerodendron odoratum*.)

*Vitex trifolia*, (negundo.)

MONADELPHIA MONOGYNIA.

*Careya* (arborea, v. *pomifera*.)

MONADELPHIA DECANDRIA.

*Geranium* (bicolor, Royle, and probably *ocellatum*, Decaisne.)

MONADELPHIA POLYANDRIA.

*Bombax Ceiba* (malabarica.)

*Bombax* (*Cochlospermum*) *gossypium*.

DIADELPHIA DECANDRIA.



Robinia 1 (*Pongamia glabra*.)

Robinia 2 (*macrophylla*.)

Robinia 3, doubtful. (*Pueraria tuberosa*. The Kumaon terms for this plant all refer to the cat, as Billee, Bilae-kund, Biralee-poua :—“cat-root,” “cat-cake,” but *why*, is difficult to say. Its host of Sanscrit names have no reference to this animal.)

*Pterocarpus* (*Dalbergia sissoo*.)

POLYADELPHIA POLYANDRIA.

*Hypericum* (*cernuum*.)

SYNGENESIA POLYGAMIA ÆQUALIS.

*Prenanthes* (not recognised, but probably a species of *Conyza*.)

(*Leucomeris spectabilis*.)

*Leontodon taraxacum* (*eriopus*.)

*Hypochæris glabra* (*Ammoseris patens*?)

*Hypochæris radiata* (*Tragopogon gracile*?)

SYNGENESIA MONOGAMIA.

*Lobelia Kalmii*. (*Pyramidalis*.)

*Viola palustris*. (*Patrinii*.)

*Impatiens noli-tangere*. (*Himiltoniana*?)

GYNANDRIA DIANDRIA.

*Limodorum* (*Apturium Smithiana*?)

*Epidendrum* 1, (*Saccolabium guttatum*, or *papillosum*, or both.)

*Epidendrum* 2, (unknown.)

GYNANDRIA DECANDRIA.

*Helicteres isora*.

GYNANDRIA POLYANDRIA.

*Grewia* 1, (*sclerophylla*.)

*Grewia* 2, (*elastica*.)

*Pothos* (*officinalis*.)

MONÆCIA TRIANDRIA.

*Phyllanthus grandifolia* (*Emblica officinalis*.)

MONÆCIA TETRANDRIA.

*Betula*, (*Alnus nepalensis*; according to General H. the leaves are “ovate, obtuse;” Roxburgh says “some obtuse, some pointed.” Certainly the same species is found from the Sutluj to the Kalee, A. obtusifolia of Royle: but probably *A. nepalensis* of previous writers. “The bark is an article of trade into the plains of Hindoostan, said to

be used by the manufacturers of Chintz to dye red, known by the name of *Ateess*." Hardwick, who so far justifies Dr. Wilson under Utivisha. But the Gurhwal term is "Ootees."

*Cicca disticha*. *Averrhoa acida*, Linnæus. *Phyllanthus* (*longifolia*) Roxburgh. (The General writes as if it were wild, but I never met it in the mountains wild or cultivated.)

*Morus* 1, (*serrata*, Roxb. *pabularia*, Decaisne. It is diæcious.)

*Morus* 2, (*indica*.)

*Morus* 3, (*serrata* : but mentioned as if monæcious.)

MONÆCIA POLYANDRIA.

*Quercus* (*incana*.)

*Juglans regia*.

*Carpinus*, doubtful. (*Engelhardtia Colebrookiana*.)

MONÆCIA MONADELPHIA.

*Pinus* *Tæda* (*longifolia*.)

DIÆCIA DIANDRIA.

*Salix* (*tetrasperma*.)

DIÆCIA PENTANDRIA.

*Xanthoxylon* (*alatum*. This is probably the "Iwurantika" or *Fever-dispeller*, of the Indian *Materia medica*, explained by Wilson as a kind of *Neem* from Nepal; which is a tolerable botanical definition as lexicons go. It is still known as "Jubrung" in Assam; Griffith. "Tejbul," the designation in the N. W. Himalaya, is from the S. Tejovutee, "a plant bearing a fruit resembling pepper," from *tejus*, pungency. The capsules are considered very cooling.

*Cannabis sativa*.

DIÆCIA DODECANDRIA.

(*Tetranthera monopetala*. Roxburgh.)

POLYGAMIA MONÆCIA.

*Terminalia alata-glabra* (*tomentosa*.)

*Mimosa* (*Acacia*) *catechu*.

*Mimosa* 2, near *Lebbeck*. (*Acacia*, now *Albizzia stipulata*, rather common at the base of the Kumaon and Gurhwal mountains, as well as in the warm vallies.)

POLYGAMIA TRIÆCIA.

*Ficus laminosa*, (common on the rocks by the river banks, at from

1500 to 2500 feet above the sea, from Burmdeo to Tupoobun on the Ganges.)

Ficus 2. (Luducca of Roxburgh ; common about Almorah as “Ka-bra.”)

Ficus 3. (Chincha, Roxburgh, also common as a shrub in Kumaon, in the low vallies, and in the forests at the foot of the mountains, it becomes a small spreading tree, probably the *F. squamosa* of Roxburgh.)

Ficus 4. (Macrophylla.)

Kaiphul. (*Myrica sapida*. From some external resemblance in fruit, the strawberry has its mountain name of “Kuphulia.”)

Place unknown, Linnæan system.

*Sterculia villosa*. The “Ooddal” of Kumaon, (Gooddala of Gurhwal,) and known by the same name down to Assam ; the inner layers of the bark making excellent rope. (Griffith, in J. A. S. April 1839.) We have also in the Catalogue of woods, J. A. S. for April 1833, *Odla* given as the Gwalpara name of *Sterculia urens*, the bark of which is there said to afford a coarse rope used in catching wild elephants. Most probably alluding to the “*Oodal*” of Assam, *Sterculia villosa*, vide Journal of Agri. and Hort. Soc. of Bengal, Vol. VI. 139. The word is Sanscrit, and is explained by Wilson, *Cordia myxa* or *latifolia* ; but the etymology from *Ood*, large, and *dul*, to split, tear, divide, must strike every one who sees the process as a strong presumption in favor of the existing usage of the term. In Khurwa-oodal, Kumaon, Khurdala, Gurhwal, we have a modification of the term to express Dr. Royle’s yellow variety of *Sterculia coccinea*.

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PROCEEDINGS  
OF THE  
ASIATIC SOCIETY OF BENGAL  
FOR JUNE, 1849.

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At a meeting of the Asiatic Society held on Wednesday, the 6th June, 1849,

The Hon'ble Sir J. W. COLVILLE, President, in the chair.

The President stated what had been done in consequence of Mr. Laidlay's illness, and communicated the proceedings of the meeting of the Council held 4th of June, 1849, as follows:—

At a meeting of the Council convened for the purpose of considering what measures should be adopted for the conduct of the affairs of the Society and the editorship of the Journal, in consequence of the illness of Mr. Laidlay, The Hon'ble Sir J. W. Colville, President, in the chair, it was resolved,

1st. That Dr. McClelland be requested to undertake the editorship of the Journal, until the return either of Dr. O'Shaughnessy or Mr. Laidlay.

2nd. That Dr. Walker be requested to perform the other functions of Secretary of the Society, until the return either of Dr. O'Shaughnessy or Mr. Laidlay.

Both gentlemen having acceded to the requests addressed to them respectively, it was ordered accordingly.

(Signed) JAMES WM. COLVILLE,  
President, Asiatic Society.

*Asiatic Society's Museum, the 4th June, 1849.*

The proceedings of the May meeting were read and confirmed, and the accounts and vouchers of the preceding month were laid upon the table.

The following gentlemen, proposed as members at the previous meeting, were balloted for and duly elected.

C. Beadon, Esq. C. S.

Dr. Rowe, Superintending Surgeon, Dacca.

R. V. Thurburn, Esq.



Robert Cathcart Dalrymple Bruce, Esq. H. M.—Regt. was proposed as a member by the Hon'ble Sir J. W. Colville, seconded by Mr. Walker.

Read letters

From W. Seton Karr, Esq. Under Secretary to the Government of Bengal, forwarding two original letters with enclosures from Capt. Ellis, Political Agent in Bundelcund, requesting queries contained therein to be filled up.

Ordered to be referred to the Oriental Section.

From R. Thornton, Esq. Assistant Secretary to the Government, North Western Provinces, forwarding a note on the transport of coal from Sonadah to Bombay by the Nurbudda.

From H. M. Elliot, Esq. Secretary to the Government of India, presenting a copy of his Supplemental Glossary.

From Dr. Campbell, Superintendant of Darjiling, journal of a Trip to Sikim.

Read extracts from a paper by B. H. Hodgson, Esq., on the Aborigines of North-Eastern India.

Read the following letter from Dr. Roer, Secretary to the Oriental Section :—

To J. W. LAIDLAY, Esq. *Vice-President and Secretary to the Asiatic Society.*

*Dated Asiatic Society, the 4th June, 1849.*

SIR,—In reply to your letter of the 9th ult., I have the honour, by direction of the Oriental Section, to state for the information of the Society, that the Section have unanimously agreed to your proposal to print the *Lalita Vistara* in the *Bibliotheca Indica*, and to recommend that the copy of the *Tarikh i Abu Sayed*, purchased by the Librarian at the sale of the Scinde property for Co.'s Rs. 33, should be taken at that price by the Society.

2. I am also directed to submit a copy of the *Kádambari*, with a letter from Pandit Madan Mohan Tarkálankár, requesting the patronage of the Society for his edition of that work, price per copy Co.'s Rs. 3, and to propose for the approval of the Society the purchase of 20 copies.

3. I forward a list of the accompanying Sanskrit books lately published in Calcutta, which the Section suggest to be purchased for the Library of the Society.

4. The MS. of the *Lalita Vistara* and the copy of the *Tarikh i Abu Sayed* are herewith returned.

I have the honor to be, Sir,

Your most obedient servant,

E. ROER, *Secy. Or. Sect. As. Soc.*

Dhátupáṭha,.....	Rs.	1	0	0
Paribhāṣā,.....		1	0	0
Shabda Sakti prakāśikā,.....		2	0	0
Khandana Khanda Khādyam, .....		3	0	0
Anumāna dīdhiti, .....		2	0	0
Anumāna Khanda,.....		1	8	0
Tatwa Kaumudī,.....		1	0	0
Kusumāñjalī, .....		1	0	0
		<hr/>		
		12	8	0

Ordered that 5 copies of the Kādambarī be purchased by the Society, and the other suggestions contained in the above letter be sanctioned.

Read a letter from Lieut. Staples, presenting in the name of Dr. Henderson, a Hybrid Dog.

From Monsieur P. W. B. de Wilde, Librarian of the Society of Arts and Sciences at Batavia, enclosing a list of books, and requesting the assistance of the Asiatic Society in procuring these at the expense of the Batavian Society. Ordered that so much of the Asiatic Researches as are in the possession of the Asiatic Society be presented to the Batavian Society, and that the librarian be directed to purchase on their account the remainder which are not published by the Society.

From Monsieur Gibelin, Procureur General at Pondicherry, presenting the second Vol. of his Etudes sur le Droit Civil des Hindous.

From Mr. Piddington, bringing to the notice of the Society, a paragraph in the Bibliotheque Universelle de Geneve for December, 1848, page 456, respecting Monsieur Csoma de Koros. Ordered that the Meeting do not think it necessary that the Society should take any notice of the paragraph in question.

For all the above communications and donations, the thanks of the Society were voted and the meeting adjourned.

Confirmed, J. W. COLVILLE, *President*.

#### LIBRARY.

The following books have been received since the last meeting :—

#### *Presented.*

Vrihadāranyakam, Kathakam, Iça, Kena, Mundakam oder funf Upanishads aus dem Yajur Sāma und Athurva-Veda. Nach den Handschriften der Biblio-

thek der Ost-Indischen Compagnie zu London, herausgegeben von L. Poley. Bonn, 1844, 8vo.—PRESENTED BY THE EDITOR.

Journal of the Indian Archipelago and Eastern Asia, Vol. III. Nos. IV. and V.—BY THE EDITOR.

Ditto ditto. Vol. III. Nos. III.—IV. (two copies).—BY THE GOVERNMENT OF BENGAL.

The Calcutta Christian Observer for June, 1849.—BY THE EDITORS.

The Oriental Baptist, No. 30.—BY THE EDITOR.

Upadesaka, No. 30.—BY THE EDITOR.

Meteorological Register kept at the Surveyor General's Office, for the month of April, 1849.—BY THE DEPUTY SURVEYOR GENERAL.

Tatwabodhini Patrikā.—BY THE TATWABODHINI' SABHA'.

The Quarterly Journal of the Geological Society, No 16.—BY THE SOCIETY.

Lois des Tempêtes ou Guide du Navigateur. Traduit de l'ouvrage de M. H. Piddington, The Sailor's Horn-book for the Law of Storms, augmenté de notes par H. Bousquet. Maurice, 1849, 8vo.—BY THE TRANSLATOR.

The Oriental Christian Spectator for April, 1849.—BY THE EDITOR.

Mortality in the Jails of the 24-Pergunnahs, Calcutta, by Lieut.-Col. Sykes.—BY THE AUTHOR, through H. M. Elliot, Esq., Secretary to the Government of India.

Vital Statistics of a district in Java, by Lieut.-Col. W. H. Sykes.—BY THE SAME.

Statistics of Civil Justice in Bengal, by Lieut.-Col. W. H. Sykes.—BY THE SAME.

#### *Exchanged.*

The Athenæum, Nos. 1114-15-16-18-19.

The London, Edinburgh and Dublin Philosophical Magazine, No. 224.

Journal Asiatique, Nos. 56-8.

The Picnic Magazine, No. 13.

#### *Purchased.*

Comptes Rendus, Nos. 3 @ 9.

The Annals and Magazine of Natural History, No. 15.

Journal des Savants for December, 1848.



*Meteorological Register kept at the Surveyor General's Office, Calcutta, for the Month of June, 1849.*

Lat.  $22^{\circ} 33' 28''$ . 33 N. Long.  $88^{\circ} 23' 42''$ . 84 East. Mag. Variation  $2^{\circ} 23' 36''$  East. Mag. Dip.  $27^{\circ} 45'$ .

Days of the Month.	Observations made at sunrise.						Maximum Pressure observed at 9h. 50m.						Observations made at apparent noon.						Observations made at 2h. 40m.						Minimum Pressure observed at 4 p. m.						Observations made at sun set.						Maximum and Minimum Thermometer.				Rain Gauges.		Days of the month.	
	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Barometer reduced to 32° Fahrenheit.	Temperature.			Wind.	Aspect of the Sky.	Maximum.	Mean.	Minimum.	Maximum.	Elevations.									
		Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.				Of the Mercury.	Of the Air.	Of Wet Bulb.							Of the Mercury.	Of the Air.	Of Wet Bulb.	Of the Mercury.	Of the Air.	Of Wet Bulb.	Of the Mercury.	Of the Air.		Of Wet Bulb.
1	29.593	82.3	80.0	79.8	S.	Cirro cumuli.	29.642	92.3	90.6	81.4	S. S. W.	Cumulo strati.	29.618	97.4	95.8	83.3	S.	Cumulo strati.	29.545	99.0	96.7	82.2	S. S. E.	Cumulo strati.	29.521	99.2	95.9	81.2	E. S. E.	Cumulo strati.	29.540	92.3	91.2	80.7	S. S. E.	Cumulo strati.	99.8	91.5	83.2	117.6	0.06	0.12	1	
2	.654	82.5	83.1	80.0	S. E.	Cloudy.	.695	91.3	89.6	83.0	S. S. E.	Ditto	.651	95.8	93.7	83.3	E. S. E.	Ditto	.574	97.5	95.0	82.6	E. S. E.	Ditto	.542	97.0	94.7	81.7	E.	Nimbi.	.607	88.0	87.3	80.9	S. E.	Cloudy.	97.9	90.2	83.0	117.7	0.06	0.12	2	
3	.626	80.8	81.0	79.2	E.	Clear.	.666	91.9	89.0	81.6	E. S. E.	Ditto	.633	95.0	91.4	80.5	E.	Ditto	.554	95.5	92.9	81.8	E. S. E.	Ditto	.543	94.9	92.4	80.6	E. S. E.	Cloudy.	.547	78.7	79.0	73.3	S. W.	Ditto	85.5	88.4	81.3	111.8	0.14	0.20	3	
4	.580	80.8	82.3	80.3	S. S. W.	Cumuli.	.648	90.2	88.7	82.0	S. W.	Cloudy.	.633	93.1	92.0	84.1	E.	Ditto	.561	95.0	94.0	83.8	S. W.	Clear.	.533	95.0	93.8	84.0	S. W.	Cirri.	.615	81.0	78.3	75.8	W.	Rainy.	95.9	87.0	78.0	106.7	0.32	0.36	4	
5	..	83.3	84.0	80.0	S. sharp.	Cirri.	..	..	..	..	..	..	.649	92.7	91.8	84.3	S. W.	Cirri.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5		
6	.635	83.3	84.0	80.0	S. sharp.	Cirri.	.663	90.3	90.3	83.2	S.	Cumuli.	.646	94.1	93.3	84.7	S.	Cumuli.	.591	95.1	94.1	85.0	S.	Cumuli.	.564	94.4	93.0	83.8	S.	Clear.	.567	90.6	90.2	83.0	S. E.	Cloudy.	96.1	90.1	84.0	107.2	0.10	0.14	6	
7	.649	77.2	77.6	74.6	W. S. W.	Cloudy.	.663	88.0	85.9	79.9	E. N. E.	Clear.	.644	93.7	92.0	82.5	E.	Clear.	.578	96.8	95.6	81.5	S.	Cumulo strati.	.535	95.7	93.7	78.8	S.	Ditto	.600	88.4	88.4	77.2	S.	Ditto	97.2	87.5	77.8	113.5	..	..	7	
8	.605	79.2	79.8	73.8	S. S. E.	Cirro cumuli.	.617	88.0	86.2	77.0	N. E.	Cirro cumuli.	.587	92.9	91.0	78.8	N. W.	Cirro cumuli.	.526	96.3	94.5	80.2	W. S. W.	Ditto	..	..	..	..	..	..	.517	90.5	89.3	77.7	S. W.	Scattered clouds	97.0	88.5	80.0	117.4	1.40	1.20	8	
9	.600	75.8	76.6	75.0	N. W.	Rainy.	.627	78.2	78.7	76.5	N. W.	Drizzly.	.592	84.0	82.8	78.9	N.	Nimbi.	.549	86.3	85.4	80.0	N. N. E.	Cloudy.	.518	86.6	85.3	78.7	N.	Cumulo strati.	.512	85.7	84.7	79.8	S. S. E.	Cirro strati.	86.3	81.1	75.3	98.2	..	..	9	
10	.542	80.0	80.6	78.4	N.	Cirro cumuli.	.581	90.6	88.8	81.0	N. N. W.	Cumulo strati.	.541	91.8	89.4	81.5	N. N. E.	Cumulo strati.	.500	90.3	88.3	82.5	N. E.	Cumulo strati.	.482	89.8	88.3	80.3	N. E.	Ditto	.504	85.7	85.0	79.3	E. S. E.	Ditto	92.4	86.6	80.7	106.8	0.22	0.30	10	
11	.540	80.2	80.8	79.2	N. E.	Ditto	.592	84.2	83.7	79.8	E. N. E.	Cloudy.	.598	85.3	84.5	79.7	E. N. E.	Cloudy.	.535	87.0	85.8	80.3	N. E.	Cloudy.	.525	87.9	86.2	80.6	E. S. E.	Ditto	.524	84.8	84.0	79.7	E. S. E.	Cirro cumuli.	87.2	84.1	80.9	97.2	..	..	11	
12	.571	78.7	79.2	78.0	S. S. E.	Cirro strati.	.606	91.3	89.0	81.6	W. N. W.	Cumuli.	.581	93.9	92.2	82.4	S. W.	Cumulo strati.	.510	97.0	95.2	82.3	W. N. W.	Cumulo strati.	.487	97.4	95.0	81.7	N. W.	Ditto	.521	91.4	89.4	82.7	S. E.	Cloudy.	97.6	88.6	79.6	119.5	..	..	12	
13	.578	79.4	80.4	78.8	S. S. E.	Cloudy.	.601	89.8	89.2	82.5	S. S. W.	Cirro cumuli.	.579	94.2	93.2	83.1	S. S. W.	Cirro strati.	.504	95.8	94.2	83.1	S. S. W.	Ditto	.479	93.1	91.7	83.0	S. S. W.	Cloudy.	.493	87.0	87.0	82.2	S. sharp.	Cloudy to N.	96.0	88.1	80.2	109.4	0.08	0.14	13	
14	.541	82.8	83.3	80.4	S. S. W.	Ditto	.565	92.1	91.3	83.3	S.	Ditto	.531	94.1	93.3	84.7	S. W.	Cumuli.	.481	95.3	94.2	84.5	S.	Ditto	.451	94.3	93.2	83.9	S.	Cumulo strati.	.458	90.2	89.7	82.3	S.	Clear.	96.0	88.1	80.2	107.7	..	..	14	
15	.525	83.2	83.7	80.7	S.	Cirro cumuli.	.557	93.0	91.9	81.9	S.	Clear.	.533	95.3	94.7	82.5	S. W.	Clear.	.475	98.0	97.2	84.4	S. E.	Ditto	.447	97.5	95.6	83.8	S. E.	Ditto	.490	90.4	89.8	80.6	S. S. E.	Cloudy N. W.	99.0	91.5	84.0	110.2	..	..	15	
16	.581	82.2	82.4	80.0	S. S. E.	Cirro strati.	.646	90.2	89.6	82.1	S. S. E.	Cumulo strati.	.617	94.7	92.9	81.2	S.	Cumulo strati.	.563	92.3	84.9	80.6	S. E.	Rainy.	.567	87.2	85.3	80.0	S. W.	Cloudy.	.591	83.7	83.4	80.5	S. W.	Nimbi.	97.0	88.0	78.9	116.0	0.42	0.48	16	
17	.620	80.8	81.3	79.4	E. S. E.	Ditto	.651	92.7	90.3	82.3	E.	Ditto	.637	85.8	85.8	80.9	E.	Nimbi.	.605	85.7	83.0	80.0	S. S. E.	Nimbi.	.586	84.3	83.3	80.4	S. E.	Ditto	.579	83.0	82.4	79.7	S. E.	Cloudy.	92.0	86.7	81.4	97.0	0.18	0.24	17	
18	.582	80.0	80.7	79.0	E.	Cloudy.	.611	91.3	87.8	81.8	E.	Nimbi.	.596	90.0	88.3	82.3	S. S. E.	Rainy.	.554	89.6	86.9	81.3	E. S. E.	Rainy.	.529	82.3	81.7	79.2	S. E.	Rainy.	.527	83.3	83.2	81.2	S. S. E.	Ditto	89.7	85.2	80.7	..	0.96	1.04	18	
19	.596	79.6	80.0	78.6	E.	Drizzly.	.617	82.0	81.8	80.0	E.	Drizzly.	.600	84.0	83.3	81.0	S. E.	Cloudy.	.529	89.3	86.3	81.3	S. E.	Cloudy.	.511	88.0	85.3	80.7	S. E.	Cloudy.	.529	83.2	81.4	79.7	S. E.	Ditto	88.0	84.0	80.0	..	0.86	0.94	19	
20	.571	78.8	79.3	78.2	E. S. E.	Cloudy.	.582	89.9	86.4	81.8	S. E.	Ditto	.585	87.0	84.0	81.4	S. E.	Rainy.	.513	88.0	87.7	83.0	S.	Nimbi.	.497	86.7	86.0	82.3	S. W.	Cumulo strati.	.509	84.4	84.3	81.3	S.	Cumulo strati.	91.3	85.1	78.9	..	0.86	0.94	20	
21	.517	80.6	80.9	79.9	S. E.	Cirro strati.	.528	89.4	88.3	82.8	S. S. E.	Cumulo strati.	.494	93.5	91.5	83.0	S. E.	Cumulo strati.	.426	87.0	85.4	80.8	S. E.	Cloudy.	.410	86.7	86.3	81.7	S. E.	Cloudy.	.436	85.4	84.5	80.5	S. E.	Ditto	92.9	87.0	81.0	110.0	..	..	21	
22	..	..	..	..	..	..	.366	92.3	90.8	82.3	N. E.	Ditto	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	22
23	.283	80.0	80.8	79.2	N.	Cloudy.	.288	86.6	85.6	81.4	N. N. W.	Cumulo strati.	.257	91.3	89.8	83.6	N. W.	Ditto	.248	79.9	81.0	79.4	S. W.	Rainy.	.253	79.3	80.4	78.3	S. W.	Very cloudy.	.286	79.5	80.0	77.6	S. W.	Cloudy.	93.7	87.3	80.8	115.8	1.50	1.64	23	
24	.494	79.2	79.5	76.1	S. sharp.	Drizzly.	.587	82.2	83.7	80.2	S. sharp.	Nimbi.	.571	88.0	87.7	81.1	S. S. W.	Nimbi.	.558	84.7	85.3	81.4	S. S. W.	Drizzly.	.554	84.3	84.0	81.3	S.	Rainy.	.584	83.8	84.3	80.7	S. W.	Ditto	89.0	83.4	77.8	97.0	0.32	0.42	24	
25	.688	80.8	81.2	79.0	S.	Cirro cumuli.	.722	85.8	85.0	80.3	S. S. W.	Ditto	.699	90.5	89.8	81.9	S. S. W.	Cumulo strati.	.643	89.0	88.2	82.3	S. W.	Cumulo strati.	.617	88.5	88.0	82.4	S.	Cumulo strati.	.644	84.7	84.8	80.3	S.	Scattered clouds	91.3	86.3	81.3	102.7	..	..	25	
26	.633	82.2	83.0	80.2	S. W.	Cloudy.	.660	88.5	88.0	82.1	S. W.	Cumulo strati.	.621	90.5	89.7	82.9	S. W.	Ditto	.574	91.3	90.4	82.7	S. W.	Ditto	.551	90.6	90.0	83.1	S. S. W.	Ditto	.562	80.2	79.8	76.9	S. W.	Drizzly.	91.8	87.4	83.0	99.8	0.22	0.30	26	
27	.571	81.3	82.8	80.0	S. W.	Ditto	.599	88.1	87.9	82.8	S. S. W.	Ditto	.559	92.8	91.8	84.0	S. W.	Ditto	.487	92.2	91.3	85.0	S.	Nimbi.	.475	90.4	90.0	84.0	S. W.	Rainy.	.522	80.2	79.5	76.0	N. N. W.	Cloudy & Thun.	95.0	87.2	79.4	109.0	0.88	0.92	27	
28	.493	81.8	82.4	80.8	S. S. W.	Ditto	.529	86.7	86.7	82.2	S. W.	Cloudy.	.508	90.8	90.0	82.8	S. W.	Cumuli.	.438	90.8	89.8	83.0	S. W.	Cumuli.	.419	91.1	90.0	82.8	S. S. W.	Cumuli.	.496	76.8	77.4	76.0	W. N. W.	Rain & Thun.	91.5	85.2	78.9	100.7	2.96	3.08	28	
29	.492	77.2	78.0	77.2	S.	Rainy.	.528	80.0	80.3	79.0	S. W.	Rainy.	.513	78.2	77.8	76.9	E. S. E.	Rainy.	.437	81.0	81.3	79.6	S. W.	Cloudy.	.438	83.2	83.3	80.4	S. W.	Cloudy.	.457	83.7	83.8	81.0	S. S. W.	Cloudy.	84.7	80.5	76.2	90.6	0.28	0.36	29	
30	..	..	..	..	..	..	..	..	..	..	..	..	.473	88.8	87.5	81.0	N. W.	Cloudy.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	30		
Mean	29.569	80.4	81.0	78.7	..	..	29.603	88.3	87.2	81.2	..	..	29.570	90.2	87.7	82.0	..	..	29.521	91.3	89.8	82.0	..	..	29.501	90.2	88.9	81.5	..	..	29.527	85.1	84.5	79.5	..	..	93.5	86.8	80.0	107.5	12.94	14.40	..	
Mean of the Corresponding month of last year.	29.529	80.4	81.0	79.0	..	..	29.563	88.6	87.4	81.7	..	..	29.540	90.7	89.2	82.3	..	..	29.486	90.4	88.8	81.9	..	..	29.469	88.7	87.3	81.4	..	..	29.486	85.9	85.5	80.5	..	..	92.8	86.9	81.1	..	12.68	13.52	..	

These Observations have been made for the most part, with a supply of new and first rate Instruments received into the Observatory, by orders of the Bengal Government, a brief description of the Instruments seems necessary.

1st.—The Barometer is a standard Instrument by Newman, diameter of the tube 0.504 Inches. The following is the comparative shewing of this Instrument and those Barometers which were in use at the Observatory prior to 1st of June, 1844.

2nd.—The Thermometer is a Standard Instrument by Newman, on metal Scale and graduated to  $\frac{1}{2}$  of a degree.

3rd.—Wet Bulb Hygrometer by Newman, graduated to single degree divisions, the difference between Standard Thermometer and dry Thermometer of this Instrument is  $+0.2$  the Temperature of the dry Bulb is taken from the Standard Thermometer, and in the event of the quantity, moisture, dew point, or dryness, being required, it is necessary the difference adverted to, be taken into calculation.

4th.—Maximum and Minimum Thermometer by Newman. The difference between these instruments, and the Standard Thermometer is  $\pm 0.7$  for the former and 0.23 for the latter.

5th.—The Temperature shown in Column 47 of a Thermometer, in sun's rays, is acquired by means of a Newmann's Maximum Thermometer having a black bulb. — The above Instruments, excepting the Thermometer placed in the sun's rays, are fixed at above 4½ feet from the ground, to a post, in a thickly choppeded house, and are freely exposed to the air and sheltered from any influence of Solar reflection.

The height of the Surface of the Mercury in the Cistern of the Standard Barometer in the Observatory attached to the Surveyor General's Office above the Mean Level of the Sea, having been deduced from a Series of Tide Observations taken from a Register kept at Kyd's Dock Yard, the result is recorded for general information.

Lowest Monthly Average of Mean Tides in the Months of February and March, above the Zero of Gauge at Kyd's Dock Yard, Calcutta,.....	8.88
Difference of Level between the Zero of Tide Gauge at Kyd's Dock Yard, and the Standard Barometer at the Observatory, .....	26.59

Height of Standard Barometer above the Level of the Sea..... 18.21

Barometer, by Troughton used prior to the 1st of June, 1844. Observations reduced to 32° Fahrenheit. ....	29.493
Do. Do. Col. Everest used from 1st of June to 31st of August, 1844. .... Do. .... Do. ....	29.637
No. 52 Standard Barometer by Newman used from 1st of September, 1844. .... Do. .... Do. ....	29.654
No. 86. .... Do. .... Do. .... Do. .... from 3d of April, 1847. .... Do. .... Do. ....	29.667

H. L. THUILLIER, CAPTAIN,  
Deputy Surveyor General,  
In charge Surveyor General's Office.























