XIV. a list of Mr. Hadyson contributions to the Journal

361. Blyth on Birds –

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OF THE

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OF

BENGAL.

EDITED BY

THE SECRETARY AND SUB-SECRETARY.

VOL. XIII.

PART I.—JANUARY TO JUNE, 1844.

Nos. 145 to 150.

NEW SERIES.

"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, in Calcutta; it will languish if such communications shall be long intermitted; and will die away if they shall entirely cease."—SIR WM. JONES.

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LIST OF MEMBERS

Of the Asiatic Society of Bengal, on 1st January, 1844.

Anderson, Major W.
Avdall, J. Esq.

Bird, Hon'ble W. W.
Barlow, Esq. R.
Bayley, Esq. H. V.
Bogle, Capt. A.
Boys, Capt. W. E.
Birch, Capt. F. W.
Bigge, Lieut. H. L.
Brandreth, Esq. J. E. L.
Broome, Lieut. A.
Benson, Esq. W. H.
Baker, Capt. W. E.
Benson, Lieut. Col. R.
Beaufort, Esq. F. L.
Batten, Esq. J. H.
Birch, Major R. J. H.
Bishop of Calcutta, Rt. Rev. Lord
Burney, Lieut. Col. H.
Blundell, Esq. E. A.
Bacon, Esq. G. W.
Baillie, Esq. N. B. E.

Cameron, Hon'ble C. H.
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Campbell, Esq. A.
Cheap, Esq. G. C.
Connoy Loll Tagore, Baboo
Cust, Esq. R.
Corbyn, Esq. F.

Dunlop, Esq. A. C.
Durand, Capt. H. M.
Dwarkinath Tagore, Baboo

Edwards, Esq. W.
Egerton, Esq. C. C.
Earle, Esq. W.
Everest, Lieut. Col. G.

Forbes, Lieut. Col. W. N.
FitzGerald, Major W. R.
Fulton, Esq. J. W.

Grant, Hon'ble Sir J. P.
——— Esq. W. P.
——— Esq. J. W.
Gladstone, Esq. M.
Goodwyn, Capt. H.
Ganthony, Esq. J.

Hannay, Capt. F. S.
Hayes, Lieut. Fletcher
Heatly, Esq. S. G. T.
Hill, Esq. G.
Huffnagle, Esq. C.
Houstoun, Esq. R.
Hæberlin, Dr. J.
Hickey, Lieut. C. E.
Hodgson, Esq. H. B.
Hutton, Capt. T.

Irvine, Lieut Col. A. (C. B.)

Jackson, Esq. W. B.
Jenkins, Major F.
Jameson, Dr. W.

Karr, Esq. W. Seton
Kistnoth Roy, Bahadoor, Rajah

Lushington, Esq. G. F.
———— Esq. E. H.
Loch, Esq. G.
Long, Rev. J. Associate Member.

Maddock, Hon'ble T. H.
McQueen, Rev. J.
Mansel, Esq. C. G.
McKenzie, Esq. J.

Mouat, Esq. F. J.
Muir, Esq. J.
Mill, Esq. J. B.
Macleod, Esq. D. F.
Middleton, Esq. J.
Macleod, Capt. W.

Nicolls, Genl. Sir J.

Ommanney, Esq. M. C.
Ouseley, Lieut. Col. J. R.
O'Shaughnessy, Esq. W. B.

Peel, Hon'ble Sir L.
Pratt, Rev. J. H.
Prinsep, Esq. C. R.
Prosonoo Coomar Tagore, Baboo
Phayre, Lieut. A.
Piddington, Esq. H. Associate Member.

Robison, Esq. C. K.
Ryan, Esq. E. B.
Ravenshaw, Esq. E. C.
Rawlinson, Major H. C.
Rustomjee Cowasjee, Esq.
Ramanath Tagore, Baboo
Ramcomul Sen, Baboo
Ramgopaul Ghose, Baboo
Radakanth Deb Behadoor, Rajah

Sleeman, Lieut. Col. W. H.
Stacy, Lieut. Col. L. R.
Sanders, Lieut. Col. E.
Sutherland, Esq. J. C. C.
Seton, Hon'ble Sir H.
Strong, Esq. F. P.
Storm, Esq. W.
Stirling, Esq. E. H.
Spilsbury, Esq. G. G.
Sutchurn Ghosal, Bahadoor, Rajah
St. Pourçain, Esq. J.
Strachey, Lieut. H.
Sprenger, Esq. A.
Stephenson, Esq. R. M.
Shortrede, Capt. R.
Stephen, Capt. J. G.
Syud Keramut Ullee, Associate Member.

Thomason, Hon'ble J.
Tickell, Lieut. S. R.
Taylor, Lieut. Col. T. M.
Torrens, Esq. H.
Trevor, Esq. C. B.
Torrens, Esq. J. S.

Winchester, Rev. W.
Walker, Esq. H.
Wade, Lieut. Col. Sir C. M.
Willis, Esq. J.
Withers, Rev. Principal G. U.
Wallis, Rev. A.
Wilcox, Major R.
White, Major M. G.

Young, Lieut. C. B.

(*Wednesday Evening, the 3rd January*, 1844.)

The monthly Meeting of the Society was held at the rooms on Wednesday evening, the 3rd January, at the usual hour. The Honorable W. W. Bird, President, in the chair.

The election of officers for the year 1844, was the first business of the meeting, and it was agreed that those of 1843 should be requested to continue. The name of Dr. A. Sprenger, B. M. S. was added to the Committee of Papers.*

R. Macdonald Stephenson, Esq. proposed at the last meeting, was ballotted for and elected. The usual communication was ordered to be made to him.

Proposed as an Honorary Member by the Hon'ble the President, and seconded by the Secretary :—

John, Prince of Saxony, brother to the reigning king.

In proposing this illustrious personage as an Honorary Member, the Honorable the President and Secretary stated, that they had done so not only in consequence of his general and well-known proficiency in literary and scientific pursuits, but specially with reference to his high attainments as a Sanscrit scholar, and his unvarying patronage on all occasions of oriental scholars and oriental literature.

The Sevres Medallion of Major Rennel, presented at the meeting of November 1843, which had been framed in black marble, was now exhibited.

The Committee named at the December meeting, to settle the form of the inscriptions on the marble tablets beneath the busts, and the height of the pedestals for them, exhibited the tablets as prepared, and referred to the bust of Mr. James Prinsep, which had been placed on a temporary stand at the height they thought suitable, for the opinion of the meeting. It was resolved, that the alteration be made as proposed.

Read the following letter addressed to the Secretary by Mr. W. Prinsep :—

To H. TORRENS, *Esq. Vice President and Secretary of the Asiatic Society, Calcutta.*

DEAR SIR,—I have the honor to acknowledge your two letters of the 28th July, one to myself in conjunction with my brother H. T. Prinsep, Esq., the other to Sir Edward Ryan, with a request to procure Kit Cat Portraits of each of these gentlemen.

I have seen these gentlemen, and we are next week to decide upon the artist and time of sitting, regarding which I shall have the pleasure of addressing you by

* N. B.—The names of Officers and Members of the Society, as they stand at the commencement of 1844, will be found at the end of the present Number.

next mail; in the meantime, as it is usual to pay down to the artist half the cost upon the first sitting, and as I believe they will cost Eighty Guineas each, I shall be glad if you will at once remit the amount necessary for this purpose. Yours faithfully,

London, 14th November 1843. WM. PRINSEP.

Ordered, that the remittance desired be made by a safe channel.

The following list of Books, presented and purchased, was read:—

Books received for the Meeting of the Asiatic Society, on the 3d January, 1844.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of November 1843.—From Government.

Calcutta Christian Observer, new series, vol. 5, No. 49, January 1844.—From the Editor.

Oriental Christian Spectator, 2d series. Bombay, December 1843, vol. 4, No. 12.—From the Editor.

Jameson's Edinburgh new Philosophical Journal. Edinburgh, 1843, vol. 35, No. 69.—From the Editor.

London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science. London, 3d series, vol. 22, Nos. 147, 148; vol. 23d, Nos. 149, 150.—From the Editor.

Proceedings of the Geological Society of London, 1842-43, vol. 4, pt. 1st, No. 92, and Index to vol. 3, November 1838 to June 1842.—Presented by the Society.

List of the Members of the Geological Society of London, 1st March 1843.

Society for the Encouragement of Arts, Manufactures, and Commerce. Premiums for the Sessions, 1843-1844, 1844-1845. London 1843.—Presented by the Society, (two copies).

Jerdon's Illustrations of Indian Ornithology. Madras, 1843, No. 1, (two copies.)—Purchased.

Graberg de Hemso, Ultimi Progressi della Geografia. Milano, 1843.—Presented by the Author.

Lassen de Taprobane insula veteribus cognita Dissertatio. Bonnæ, 1842. Pamph.—From the Author.

Moise de Khoréne, Auteur du ve. Siecle. Histoire D'Armenie, Texte Armenien et traduction Française par P. E. Le Vaillant de Florival. Venise, 1841, 2 vols. 8vo.—Presented by J. Avdall, Esq.

Bulletin de la Societe de Geographie, 2d serie. Paris, 1842, tome 18.—Presented by the Society.

Journal Asiatique ou Recueil de Memoires, 3d serie. Paris, November, December 1842, tome 14, No. 79, et 4th serie. Mars, 1843, tome 1, No. 3.—Presented.

Annales des Sciences Physiques et Naturelles, D'Agriculture et D'Industrie. Lyon, 1838-40, 3 vols. 4to.—Presented.

Journal des Savants. Paris, 1843, Avril, Mai, et Juin.—Purchased.

The Librarian also presented a condensed report of the Books and Pamphlets added to the Library during the year 1843, which was ordered to be printed, and will be found at the conclusion of the Proceedings.

Dr. A. Sprenger submitted a specimen sheet of the Dictionary of Suffectic Terms now printing by the Society under his supervision.

Read the following letter from Messrs. W. and H. Allen and Co. the Society's Agents and Booksellers :—

To H. TORRENS, *Esq. Secretary to the Asiatic Society of Bengal.*

SIR,—We have received your favor of the 18th July last, enclosing a bill of lading for a case of Books for Mr. Konig, and also a letter for that gentleman has been received, and shall have our attention on the arrival of the Ship "*Cuthbert Young*," by which vessel the box is consigned to us.

Your favor of the 28th July, enclosing a letter for Sir Edward Ryan and H. T. Prinsep, Esq., also one for H. T. and W. Prinsep, Esqrs. have both been delivered to the latter gentleman, the two former being absent from London at the time of the receipt of the letters by us.

Your further favor of the 7th August, enclosing a bill of lading for 25 copies of the Mahabarata, complete, and the same No. of the Index only, shipped by the "*City of Poonah*," has duly come to hand, but the arrival of the vessel is not expected for some time. We have the honor to be, Sir,

London, 31*st October*, 1843. Your most obedient servants,

W. H. ALLEN & Co.

Read the following letter and enclosure from the Librarian :—

To H. TORRENS, *Esq. Secretary, Asiatic Society.*

SIR,—I have the honour to forward you the accompanying note of Messrs. Thacker and Co. who apply for a deduction of 25 per cent. on the Tibetan books, which appears to have been formerly granted to them by the Secretary of the Society on the Asiatic Journal.

In laying this request of Messrs. Thacker and Co. before the Committee, I would beg to suggest to them to pass a rule, respecting the sale of all their publications to booksellers, and should such a deduction be conceded, to ask in return the same allowance from them. I have the honour to be, Sir,

Your most obedient servant,

Asiatic Society, 21*st December*, 1843. E. ROER.

Enclosure: Messrs Thacker and Co's. compliments to Dr. Roer, and beg to state, that they have been in the habit of paying only 1-8 per No. for the Asiatic Society's Journal, the usual charge being 2, from which a discount of 25 per cent. is allowed to them. Messrs. Thacker and Co. will thank Dr. Roer to send the voucher, as they think they only received Nos. 47 and 48. They will further feel obliged, if he will kindly take off the usual allowance for the two Tibetan books.

Calcutta, 18*th December*, 1843.

After some conversation it was agreed on, that the allowance desired, should be made, upon condition that it should be reciprocal.

Read the following letter from the Secretary to the Societé Royale d'Agriculture, &c. &c. of Lyons :—

Le Secretaire-Archiviste de la Société Royale d'Agriculture, Histoire Naturelle et Arts utiles de Lyon.

MONSIEUR LE PRESIDENT.—Je suis chargé au nom de la Société Royale d'Agriculture de Lyon de vous offrir la collection de ses Annales pour la Société du Bengal.

Nous nous estimerons heureux si la compagnie savante que vous présidez jugera le recueil assez digne d'interêt pour nous honorer d'un échange de ses travaux.

Veuillez agreér, je vous prie, Monsieur, le sentimens de haute consideration avec lesquels. J'ai l'honneur d'être,

Lyon, le 1ere Juin, 1841. Votre tres humble et obeissant serviteur,

A Monsieur le Président de la Société du Bengale. G. MULSANT.

Ordered, that a copy of the Journal be regularly dispatched to this Society.

Read the following letter from Capt. Bonnevie :—

To H. TORRENS, *Esq. Honorary Secretary to the Asiatic Society.*

SIR,—I had the honour in April or May last, to forward you a letter from the University of Christiania in Norway, accompanied by various specimens of natural history, minerals, coins, books, &c. &c. which you did me the honour favorably to acknowledge, expressing your willingness to readily reciprocate. Desirable opportunities now offer themselves for the dispatch of any variety which your Society may be pleased to present to the Christiania University by vessels bound to London, and any communication addressed to the Swedish and Norwegian Consul General in that port, Chas. Tottie, Esq. will be duly dispatched, or if forwarded to my friends, Messrs. J. Mackey and Co. of this city, they will be duly cared for, and forwarded to their destination.

I have the honour to be, Sir,

Calcutta, 30*th December*, 1843. Your most obedient servant,

C. S. BONNEVIE.

The Secretary was requested to inform Capt. Bonnevie, of what had been already dispatched to the University from the Library and Zoological Department, and what was in train of being so, from other departments.

Read the following letter from J. Avdall, Esq.:—

To H. TORRENS, *Esq. Secretary, Asiatic Society.*

MY DEAR SIR,—Herewith I beg to send you, for presentation to the meeting of the Asiatic Society, a copy of the History of Armenia, by Moses Khorenensis, translated into French by P. E. Le Vaillant De Florival, and printed with the Text at Venice in 1841, 2 vols. I remain,

Your's faithfully,

Calcutta, 30*th December*, 1843. JOHANNES AVDALL.

Messrs. Ostell and Lepage having sent two Numbers of the Zoology of the Voyage of H. M. S. *Sulphur*, Capt. Belcher, for inspection, a subscription for one copy on the part of the Society was authorised.

Read the following letter, accompanying two Models of a Boat and Float which were on the table :—

W. H. TORRENS, *Esq. Secretary to the Asiatic Society.*

SIR,—Having two models of Steamers on the Archimedean principle, I am desirous to place them in the Museum, with the view of exposing them to the gentlemen of Calcutta, who may honour that place with their presence, in the hope of meeting with encouragement to get up a vessel on this plan for inland navigation, in which I would wish to take share and devote my time to the furtherance of, after May next; otherwise I would dispose of them at a moderate price; and shall feel obliged by your kindly allowing them to be placed there for a short time.

I shall be happy at any time to set them in motion in a trough of water, for the satisfaction of gentlemen wishing to see them act. I remain, Sir,

Your obedient servant,

Calcutta, 23rd December, 1843. GEORGE NICKS, *Engineer, Hon'ble Co's. Service, Kidderpore.*

Read the following letter from G. Buist, Esq. Bombay.

DEAR SIR,—The Bengal Asiatic Society appears to be under a misapprehension as to there being any reprint of the Transactions of the Bombay Branch, there is none such. I believe the new issue for two years past, in process of publication, has always been forwarded to Calcutta.

The misapprehension may have arisen from the circumstance of the Bombay Geographical Society being presently engaged in reprinting their transactions: these have been desired to be sent to you, and I shall take care that they are duly forwarded the moment they have passed through the press. The printer is now far advanced with them.

The reports of the Observatory formerly applied for through Government, will be completed very shortly, and sent to your address.

I have the honour to be, Sir,

Your most obedient servant,

Bombay Observatory, GEO. BUIST,

28th November, 1843. *Secretary to the Geographical Society.*

A catalogue of the additions to the Library was presented by the Librarian, and ordered to be printed with the January (the present) number of the Journal. Account sales of Oriental publications was also submitted as follows :—

Oriental Publications, &c. sold from the 9th January up to the 14th December, 1843.

	Rs.	*As.*
Mahabharata, vols. I to IV, 8 copies each, ...	320	0
Index to ditto, vols. I, II, III, 6 copies each, and vol. IV, 7 copies, ..	37	8
Naishada, 3 copies, ...	18	0
Sausruta, vols. I and II, 1 copy each.	8	0
Hariwansa, 1 copy, ...	5	0
Sanscrit Catalogue, 2 copies, ...	2	0
Futawe Alemgiri, vol. I, one copy; vol. II, one ditto; vol. III, 2 ditto; vol. vol. IV, 8 ditto; vol. V, 10 ditto; vol. VI, 9 ditto, ...	250	0
Carried over, ...	640	8

Brought over, ...	640	8
Jawame-ul-Ilm-ul-riazi, one copy, ...	4	0
Khazanat-ul-Ilm, one copy, ...	8	0
Sharaya-ul-Islam, 2 copies, ...	16	0
Asiatic Researches, vols. XVIII, 1 copy; XIX, 1 ditto; XX, 2 ditto, ..	40	0
Journal of the Asiatic Society, Nos. 52, 56, 61, 65, 84, 90, 103 to 119, 125 to 130, and Supplement to No. 126, one copy each, ...	51	8
Total Rupees	760	0

E. ROER,

Calcutta, the 2d January, 1844. *Librarian, Asiatic Society.*

Read report of the Curator Museum of Economic Geology, for the month of December.

REPORT OF THE CURATOR MUSEUM ECONOMIC GEOLOGY AND GEOLOGICAL AND MINIRALOGICAL DEPARTMENT, FOR THE MONTH OF DECEMBER.

Mineralogical and Geological.—I have been unable to complete, for this month, the arrangement of the specimens brought by Capt. Russell from the Cheduba Archipelago, but I trust to do so by next month. I have moreover not yet obtained Capt. Russell's detailed report.

Capt. Newbold, M. N. I. has sent us from Kurnool three small, but very curious, specimens of "organic bodies in a vein of chert in the Kurnool limestone." When examined by a magnifier, these are seen to be minute nummulites, more or less silicified. None of them effervesce with acids, though the matrix in the less compact looking parts does so. It is probable that the limestone would be also found to contain these bodies, either at the spot these were found, or in the vicinity of it. In a geological point of view, the presence of the fossils of so recent a formation in that quarter of India is highly interesting.

Museum Economic Geology.—Capt. Shortrede has, at my request, kindly sent us a box, containing eight specimens of tolerable size of the lithographic stones from near Rewah, of which impressions and specimens were presented at the September and October meetings; these are now in the hands of Mr. Black for trial and report.

Mr. W. C. Drew has presented us with a mineral, which though common enough in itself, is from its locality of considerable interest. It is a fragment of argentiferous lead ore from Adelaide in Australia: of which I learn that so large a quantity as eight tons had been sent from that port to Sydney for smelting.

Capt. Oldfield, Executive Engineer of the Saugor division, has presented us with a very interesting set of specimens of iron ores, and other minerals from that district. His letter is as follows:—

To H. PIDDINGTON, *Esq. Curator of the Economic Museum, Calcutta.*

SIR,—Having been favoured by you with a copy of the printed Memorandum relative to the objects of the Museum of Economic Geology, I took the opportunity of passing through the town of Heerapoor in Bundelkund, to observe the method of smelting, and to collect some iron ores from that district.

The large specimen marked 'Heerapoor iron ore,' shews the average quality, of which the quantity is unlimited. The whole neighbourhood may be said to abound in iron, the ore is at the surface, or rather the mines are mere caves in iron rocks. The iron stone

is first broken down, and afterwards into smaller pieces of about an inch in diameter, by small hand hammers, mixed with double its weight of charcoal, and put into clay furnaces about 5 feet high and one-half in diameter, the draft is given by a hand bellows, the nozzles of which are of fine clay and require constant renewal.

The slag is drawn off by tapping the lower part of the furnace; the iron however is not completely fused, but is taken only by tongs through the top of the furnace; after withdrawal of the slag. At this stage, it is of a pale straw colour, and is at once subjected to hammering, by which it loses one-third of its weight, this hammering being continued till the iron is cool, it is then considered ready for forging. As a specimen of the manufactured iron, I send half a tawa, or scone for baking chupattees, weighing about 4lb.

I send also some specimens of iron ore kindly collected at my request for the Museum, by Lieut. Turner, 51st N. I. when that officer was on detached duty at Tendookheru, a village south of Saugor, and within a few miles of the Nerbudda. From these mines, the iron of which Col. Presgrave formed the bars for the Suspension Bridge over the Beas river near Saugor, was procured.

No. 1, is the rock of which the hills containing the ore mostly consist.

No. 2, is the ore.

No. 3, Slag.

No. 4, Iron from the furnace, unrefined by forging.

From the neighbourhood of Saugor I send specimens of Kunkur, No. 5 and 8 of which, should you have leisure, I should be glad to obtain a correct analysis.

The specimens of mortar or concrete which I send, were formed from a mixture of lime made from kunkur No. 5, with gravel and tile dust. One specimen had water poured on it a few minutes after it was mixed, and commenced hardening from that moment; the surface set very quickly; the lime used was rather stale, having been burned upwards of a month, and exposed to a damp atmosphere. It was carefuly ground, however, a measure essential to the goodness of mortar made with kunkur or other hydraulic limes. I have added some specimens of limestone marked No. 6, found in masses or boulders imbedded in the black soil of the Saugor district, and a specimen of the red sandstone of that part of the country, which in many places is in laminæ sufficiently thin to be used for roofing purposes in lieu of slates. It is likewise found in slabs, used in thicknesses of 3 or 4 inches as architraves, having a bearing of from 6 to 8 and even 10 feet. This stone is likewise in general use for marble masonry, being more commonly found massive or with irregular lamination.

I take the opportunity of adding as mere matters of curiosity, at least, without reference to any building or other useful purpose in the Saugor district,

A specimen of granite from Debsor river in Bundelkund.

A specimen of a dark compact rock with the character of which I am unacquainted.* From the position in which I found it, I believe it to extend over a large tract of country in the Jhansi state on the left bank of the Debsor, at a depth of from 30 to 40 feet from the surface.

I have the honour to be, Sir,

Your most obedient servant,

J. N. Oldfield, *Capt.*

Executive Engineer, Saugor Division.

7, Russell Street, Chowringhee,
December 2d, 1843.

* It is an indurated and somewhat fibrous clay slate.—H. P.

ABSTRACT

Of the List of Books received into the Library, from the 13th January to the 6th December 1843.

Note.—The number of all the Books, received during last year, amounts to 391.

English Books.

Annals and Magazine of Natural History. London, Nos. 62, 63, 64, 68, 69, 71, 72, 75, 76,—9 Nos.

Archæologia, or Miscellaneous Tracts relating to Antiquities. London, 1842, Vol. xxix,—1 vol.

Arrowsmith's Map of India. London, 1840, 1 No.

Audubon's and Bachman's Descriptions of new species of Quadrupeds inhabiting North-America. 1 pamphlet.

Bernier's Travels, comprehending a description of the Mogul Empire, translated from the French by J. Stuart. Calcutta, 1826, 1 vol.

Batten's Report on the Settlement of the district of Gurhwal, in the province of Kemaon. Agra, 1843, 1 pamphlet.

Buist's Comparative Readings of Eight Barometers. 1843, (a leaf,) 1 No.

Calcutta Christian Observer. New Series. Nos. 37 to 40, 42 to 48, 11 Nos.

Calcutta Literary Gleaner, 1842, Vol i, Nos. 11 and 12, 1843-Vol. ii, Nos. 1 to 8, 10 Nos.

Calcutta Journal of Natural Science, 1843. Vol. iv, No. 13. 1 No.

Calendars of the Proceedings in Chancery in the reign of Queen Elizabath. 3 vols.

Callery's Encyclopedia of the Chinese Language. London, 1842. 1 pamphlet.

Collection of Papers regarding the course of the Indus, and especially of its Eastern Mouth and the Branches falling into the Run, of Cutch. Calcutta, 1842, 1 vol.

Darwin's Journal of Researches into Geology and Natural History. London, 1839, 1 vol.

Documents relating to the Gates of Somnath. 1 pamphlet.

Early Records in Equity. Calcutta, 1842. 1 vol.

Francis's and Craft's Chemical Gazettte. 1842, No. 1, 1 No.

Goodwyn's Memoir of an improved system of Suspension-Bridges, on the principle adopted by Mr. Dredge. Calcutta, 1843, 1 pamphlet.

Gould's Monograph of the Ramphastidæ, or Family of Toucans. London, 1834. 1 vol.

Gray's List of the Genera of Birds. London, 1841, 1 vol.

——— Specilegia Zoologica, pt. i, 1 No.

——— Zoology of the Voyage of H. M. S. Sulphur, Mamnalia pt. i. London, 1834, No. 1, 1 No.

Gutch's Quarterly Journal, Vol. i, No. 6, 1 No.

Hart's Report on the Trade and Resources of Kurrachee. Calcutta, 1843, 1 vol.

Herapath's Railway and Commercial Journal, 1843. Vol. v, No. 178, 1 No.

Ibn Khallikan's Biographical Dictionary, translated from the Arabic by Baron MacGucklin de Slane. Paris, 1842, Vol. i. 1 vol.

Jameson's Edinburgh New Philosophical Journal, Nos. 63, 66, 67, 68. 4 Nos.

Journal of the Agricultural and Horticultural Society of India, 1842, Vol. i and Vol. ii, Nos. 1 to 9, 1 vol. 9 Nos.

——— of the Bombay Branch Royal Asiatic Society, Nos. 4 and 5, 2 Nos.

——— of the Royal Geographical Society of London, 1842, Vol. xii, pts. 1 and 2, 2 Nos.

Landers' Memoranda upon the State of Indian Bazaar Weights and Measures. Calcutta, 1843, 1 pamphlet.

Leach's Zoological Miscellany. London, 1814-17, 3 vols.

List of Members and Correspondents of the Academy of Natural Sciences of Philadelphia. 1 pamphlet.

——— of the Fellows, Members, &c. of the Zoological Society of London. 1842, 1 pamphlet.

London, Edinburgh and Dublin Philosophical Magazine and Journal of Science. 3d Series, Nos. 134 to 142, and 145 and 146, 11 Nos.

Martyn's English Entomologists, exhibiting all the Coleopterous Insects, found in England. London, 1792, 1 vol.

Meteorological Register, kept at the Surveyor General's Office, Calcutta, January to December, 1840. March, April, July and September 1841, November 1842, January to April, and June to October 1843, 26 Nos.

Miles' Translation of the History of Hydur Naik. London, 1842, 1 vol.

Morton's Catalogue of the Skulls of Man, and the inferior Animals. Philadelphia, 1840, 1 pamp.

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——— British Settlement in the Straits of Malacca. London, 1839, 2 vols.

——— Mineral Resources of Southern India. 1 pamphlet.

Nicollet's Essay on Meteorological Observations, 1839, 1 pamphlet.

Oriental Christian Spectator, 2nd Series. Bombay, 1842, Vol. iii, Nos. 8, 11, 12, 1843; Vol. iv, No. to 11, and the Supplement, 14 Nos.

Papers regarding the Scinde and Begarree Canals. Calcutta, 1843, 1 pamphlet.

Pinnock's and Moore's Report of Experiments of the actions of the Heart. Philadelphia, 1839. 1 pamphlet.

Penny Cyclopædia of the Society for the Diffusion of Useful Knowledge. London, 1833 to 42, 24 vols.

Piddington's Chart of the 8th Memoir on the Law of Storms in India, being the track of the Madras Hurricane of the 24th October, 1842, over the Peninsula of India and the Arabian Sea. 2 pamphlets.

——— English Index to the Plants of India. Calcutta, 1832, 1 vol.

——— Tabular view of the Generic Characters of Roxburgh's Flora Indica, 1836, pt. 3d, 1 No.

Pratt's Mechanical Philosophy, second edition. 1 vol.

Proceedings of the Academy of Natural Sciences of Philadelphia. Nos. — to 25 (11 to 16, two copies,) 31 Nos.

——— of the American Philosophical Society, 1841-42. Vol. ii, Nos. 9 to 14, and 18 to 22, 11 Nos.

——— of the Geological Society of London, 1840-42. Vol. iii, pt. ii, Nos. 72 to 76 and 87 to 91, 10 Nos.

——— of the London Electrical Society, 1842-43, Vol. i, pts. 5, 6, 7, and 8, 4 Nos.

——— of the Zoological Society, 1841, pts. 9 and 10, 2. Nos.

Redfield on Whirlwind Storms, with Replies to the Objections and Strictures of Dr. Hare. New York, 1842, 1 pamphlet.

Redfield's Reply to Dr. Hare's further Objections relating to Whirlwind Storms. 1 pamphlet.

Report of a Committee (appointed,) of the British Association for the Advancement of Science, 1842. 1 pamphlet.

——— of the British Association for the Advancement of Science and Arts, 1842, 1 vol.

——— on the Kulleeree Canal, 1840. 1 pamphlet.

——— on the strength of Materials for Steam Boilers. Philadelphia, 1837, pt. ii, 1 No.

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Rogers' Third Annual Report on the Geological Survey of the State of Pennsylvania. Harrisburgh, 1839, 1 pamphlet.

Ross's Survey of Cheduba Straits and Coasts of Ramree, 1832, (a leaf,) 1 No.

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Say's Description of some new Terrestrial and Fluviatile Shells of North America. 1 pamphlet.

Second Bulletin of the Proceedings of the National Institution for the Promotion of Science. Washington, 1842, No. 2d, 1 No.

Selections from the most remarkable and interesting of the Fishes found on the Coast of Ceylon. 2nd Edition. London, 1843, 1 vol.

Smith's Illustrations of Zoology, 1838-43, No. 1 to 14, 16 and 17, 16 Nos.

Specimens of the Popular Poetry of Persia, translated by A. Chodzko. London, 1842, 1 vol.

State of New York in Assembly 1840, No. 50, and 1841, No. 150, 2 Nos.

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Survey of the Route from Kurrachee to Sehwan. Calcutta, 1843, 1 vol.

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——— of the Geological Society, 2nd Series. London, 1842, Vol iv. pt. ii, 1 No.

——— of the Royal Astronomical Society. London, 1842-43, Vols. 12, 13 and 14, 3 vols.

——— of the Society of Arts, &c. Vol. liii, pt. ii, 1 No.

White's Icones Plantarum Indiæ Orientalis. Madras, 1842. Vol. ii. pt. iv, 1 No.

Wilcock's Dictionary of the English and Dutch, Dutch and English Languages. London, 1798, 1 vol.

Wood's Memoir of the Life and Character of the late J. Parrish. Philadelphia, 1840, 1 pamphlet.

Yarrell's History of British Birds. London, 1842, Vol. i, pts. xxi and xxxiv to xxxvii, 5 Nos.

French.

Actes de L'Académie Royale de Sciences, Belles-Lettres et Arts de Bordeaux, 1840, 2d Année, iv. Trimestres, 1841; 3d Année iv, Trimestres, 1842, 4th Année, i Trimestre, 9 Nos.

Bibliothèque de M. Le Baron S. de Sacy. Paris, 1842, tome 1, 1 vol.

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Callery, Dictionnaire Encyclopédique de la langue Chinoise. Paris 1842, 1 vol.

Delessert, Souvenirs d'un Voyage dans l'Inde, executé de 1838 à 1839. Paris, 1834, 1 vol.

Fabius, Aoffrande au Dieu de l'Univers. Lyon, 1842, 1 pamphlet.

Foucaux, Discours prononcé à L'ouverture du Cours de l'angue et de litterature Tibetiéne, 1 pamp.

——— Extrait du Kan-Jour. Paris, 1842, 1 pamphlet.

Hemso (G. de) Observations authentiques sur la Peste du Levant. 1 pamphlet.

Journal Asiatique. Paris, 3d Série, tome xiii, Nos. 73, 74 and 75, tome xiv, Nos. 76, 77 and 78, 4 Série, tome i, Nos. 1 and 2, 8 Nos.

——— des Savants. Paris, Juillet à December, 1842, Jauvier, Fevrier. Mars. 1843, 9 Nos.

Julien, Exersices pratiques d'analyse de Syntaxe et de Léxigraphie Chinoise. Paris, 1842, 1 vol.

——— Simple exposé d'un fait honorable odieusement dénaturé dans un libelle recent de M. Pauthier. Paris, 1842, 1 pamphlet.

Mémoire sur le Lac Mæris, par L. de Bellefonds. Alexandric, 1843, 1 pamphlet.

Pauthier, Examen Méthodique des faits qui concernent Le Thean—Tchu ou L'Inde. Paris 1849, 1 pamphlet.

Réponse à l'éxamen Critique. Paris, 1842, Vindiciæ Sinicæ. Dernier réponse á M. S. Julien. Paris, 1842, 1 pamphlet.

Roberts, Fragment d'un Voyage dans les Provinces Interieures de L'Inde, en 1841. Paris, 1843, 1 pamphlet.

Tassy, (G. de.) Chapitre inconnu du Coran. 1 pamphlet.

——— Saade, auteur des premières Poësies Hindoustani. Paris, 1843, 1 pamphlet.

Latin.

Callery, Systema Phoneticum Scripturæ Sinicæ. Macao, 1841. Paris i and ii, 2 Nos.

De numis medii ævi, in Norvegia nuper repertis. Particula Posterior. 1837, 1 pamphlet.

Ebermayer, Gemmarum affabre Sculptarum Thesaurus, 1720, 1 vol.

Gazophilatium linguæ Persarum. Authore P. Angelo a S. Joseph. Amstelodami, 1684, 1 vol.

Hansteen, De mutationibus Virgæ Magneticæ, 1842, 1 pamphlet.

Holmboe, De Prisca re Monetaria Norvegiæ, scripsit, 1841. 1 pamphlet.

——— Descriptio ornamentarum aureorum et numorum in Norvegia Repertorum. 1826, (two copies,) 2 pamphlets.

Index Scholarum in Universitate Regia Fredericiana 59 ejus semestri, 1842, (two copies,) 2 pamp.

Norvegian.

Aarsberetning for det Kongelige Norske Frederiks Universitets for Aaret, 1840, 1 pamphlet.

Abel's Varker 2 Band, (œures complétes du Mathématicien Novégien N. H. Abel, redigées par ordre du Roi, par B. Holmboe,) 2 vols.

"Heimskringla" eller Snorre Sturlesons norske Kongers Sagaer, med 3de Karter og fure Slaalstet, 1 vol.

Indby delsesskrift i anledaring af den Hortidelige nedlæggelse af Grundstenen til nye Bygninger for det Kongelige norske Frederiks Universitet trediveaarsdagen efter dets stiftelse den 2den. September, 1841, 1 pamphlet.

Lærebog i Mechaniken af Chr. Hansteen. 2 Bind, 2 vols.

Norges Statistiks of Schweigaard, 1st deel, 1 vol.

Nyt Magazine for Naturvidenskaberne, 11 hefter, 11 Nos.

Rafn, Antiquitates Americanæ. Hafniæ, 1837, 1 vol.

Statistiske Tabeller for Rongeriget Norge, 1er till 5th. Rækk, 5 vols.

Universiteterne i Christiania og Upsala, 1 vol.

German.

Bopp, Vergleichende Grammatik des Sanskrit, Zend, Griechischen, &c. &c. Berlin, 1842, 1 vol.

Gaea Norvegica, 1838. Erstes Heet, 1 vol.

Italian.

Hemso, (G. de) Degli ultimi progressi della Geographia. Milano, 1841-42, 2 pamphlets.

Zend.

Vandidád Sádé of the Parsis, in the Zend language, but Gujarati character, by the late Framjí Aspandiárjí, 1842, 2 vols.

Chinese.

Chinese wood engraving and description of the Porcelain Tower of Nankin, (a leaf,) 2 Nos.

Arabic.

Hashia Saddoor Rúddín Mohammed Amín, MS. 1 vol.

Hashia Sayid Sherrif, MS.

Persian

Diwan Sherrif, MS. 1 vol.

Jawaherul Koran, MS. 1 vol.

Sanscrit.

Goladhyáya, by Bháshkara Achárya. Edited by L. Wilkinson. Calcutta, 1842, 1 vol.
Grahlághava, by Malléri. Edited by L. Wilkinson. Calcutta, 1843, 1 vol.
Gunitádhyáya, by Bháshkara Achárya. Edited by L. Wilkinson. Calcutta, 1842, 1 vol.
Johnson's Selections from the Mahabharata. London, 1842, 1 vol.
Sanhita of the Sama Veda. London, 1843, 1 vol.
Wilson's Megha Duta, or Cloud Messenger. London, 1843, 1 vol.

Amount of Books in each Language.

English,	293
French,	43
Latin,	11
Norvegian,	26
German,	2
Italian,	2
Zend,	2
Chinese,	2
Arabic,	2
Persian,	2
Sanscrit,	6
Total,	391

LIST OF MEMBERS

Of the Asiatic Society of Bengal, on 1st January, 1844.

Anderson, Major W.
Avdall, J. Esq.

Bird, Hon'ble W. W.
Barlow, Esq. R.
Bayley, Esq. H. V.
Bogle, Capt. A.
Boys, Capt. W. E.
Birch, Capt. F. W.
Bigge, Lieut. H. L.
Brandreth, Esq. J. E. L.
Broome, Lieut. A.
Benson, Esq. W. H.
Baker, Capt. W. E.
Benson, Lieut. Col. R.
Beaufort, Esq. F. L.
Batten, Esq. J. H.
Birch, Major R. J. H.
Bishop of Calcutta, Rt. Rev. Lord.
Burney, Lieut. Col. H.
Blundell, Esq. E. A.
Bacon, Esq. G. W.
Baillie, Esq. N. B. E.

Cameron, Hon'ble C. H.
Cautley, Capt. P. T.
Campbell, Esq. A.
Cheap, Esq. G. C.
Connoy Loll Tagore, Baboo
Cust, Esq. R.
Corbyn, Esq. F.

Dunlop, Esq. A. C.
Durand, Capt. H. M.
Dwarkinath Tagore, Baboo

Edwards, Esq. W.
Egerton, Esq. C. C.
Earle, Esq. W.
Everest, Lieut. Col. G.

Forbes, Lieut. Col. W. N.
FitzGerald, Major W. R.
Fulton, Esq. J. W.

Grant, Honb'le Sir J. P.
——— Esq. W. P.
——— Esq. J. W.
Gladstone, Esq. M.
Goodwyn, Capt. H.
Ganthony, Esq. J.

Hannay, Capt. F. S.
Hayes, Lieut. Fletcher
Heatly, Esq. S. G. T.
Hill, Esq. G.
Huffnagle, Esq. C.
Houstoun, Esq. R.
Hæberlin, Dr. J.
Hickey, Lieut. C. E.
Hodgson, Esq. H. B.
Hutton, Capt. T.

Irvine, Lieut. Col. A. (C. B.)

Jackson, Esq. W. B.
Jenkins, Major F.
Jameson, Dr. W.

Karr, Esq. W. Seton
Kistnoth Roy, Bahadoor, Rajah

Lushington, Esq. G. F.
———— Esq. E. H.
Loch, Esq. G.
Long, Rev. J. Associate Member.

Maddock, Hon'ble T. H.
McQueen, Rev. J.
Mansel, Esq. C. G.
McKenzie, Esq. J.

Mouat, Esq. F. J.
Muir, Esq. J.
Mill, Esq. J. B.
Macleod, Esq. D. F.
Middleton, Esq. J.
Macleod, Capt. W.

Nicolls, Gen. Sir J.

Ommanney, Esq. M. C.
Ouseley, Lieut. Col. J. R.
O'Shaughnessy, Esq. W. B.

Peel, Hon'ble Sir L.
Pratt, Rev. J. H.
Prinsep, Esq. C. R.
Prosonoo, Coomar Tagore, Baboo
Phayre, Lieut. A.
Piddington, Esq. H. Associate Member.

Robison, Esq. C. K.
Ryan, Esq. E. B.
Ravenshaw, Esq. E. C.
Rawlinson, Major H. C.
Rustomjee Cowasjee, Esq.
Ramanath Tagore, Baboo
Ramcomul Sen, Baboo
Ramgopaul Ghose, Baboo
Radakanth Deb Bahadoor, Rajah

Sleeman, Lieut. Col, W. H.
Stacy, Lieut. Col. L. R.
Sanders, Lieut. Col. E.
Sutherland, Esq. J. C. C.
Seton, Hon'ble Sir H.
Strong, Esq. F. P.
Storm, Esq. W.
Stirling, Esq. E. H.
Spilsbury, Esq. G. G.
Sutchurn Ghosal, Bahadoor, Rajah
St. Pourçain, Esq. J.
Strachey, Lieut. H.
Sprenger, Esq. A.
Stephenson, Esq. R. M.
Shortrede, Capt. R.
Stephen, Capt. J. G.
Syud Keramut Ullee, Associate Member.

Thomason, Hon'ble J.
Tickell, Lieut. S. R.
Taylor, Lieut. Col. T. M.
Torrens, Esq. H.
Trevor, Esq. C. B.
Torrens, Esq. J. S.

Winchester, Rev. W.
Walker, Esq. H.
Wade, Lieut. Col. Sir C. M.
Willis, Esq. J.
Withers, Rev. Principal G. U.
Wallis, Rev. A.
Wilcox, Major R.
White, Major M. G.

Young, Lieut. C. B.

Rules of the Asiatic Society.

The following is an abstract of the rules of this Institution which are now in force, including those printed in the Appendix to the sixth and subsequent volumes of the Society's Transactions.

Original Rules adopted from the Founder's Discourse, 15th February, 1784.

1.—The Institution shall be denominated the Asiatic Society, the bounds of its investigations will be the Geographical limits of Asia, and within these limits its enquiries will be extended to whatever is performed by man or produced by nature.

2.—Weekly Meetings shall be held for the purpose of hearing Original Papers read on such subjects as fall within the circle of the Society's enquiries.

3.—All curious and learned men shall be invited to send their Tracts to the Secretary, for which they shall immediately receive the thanks of the Society.

4.—The Society's Researches shall be published Annually, if a sufficiency of valuable materials be received.

5.—Mere Translations of considerable length shall not be admitted, except of such unpublished Essays or Treatises as may be transmitted to the Society, by Native Authors.

6.—All questions shall be decided on a Ballot, by a Majority of two-thirds, and nine Members shall be required to constitute a Board for such decisions.

7.—No new Member shall be admitted who has not expressed a voluntary desire to become so, and in that case, no other qualification shall be required, than a love of knowledge, and a zeal for the promotion of it.

Subsequent Resolutions of the Society which are in force.

8.—The future Meetings of the Society shall be held on the first Wednesday of each month; at half-past Eight o'clock in the Evening.

9.—If any business should occur to require intermediate Meetings, they may be convened by the President, who may also, when necessary, appoint any other day of the week, instead of Wednesday for the stated Meetings of the Society.

10.—As it may not always be convenient for the President to attend the Meetings of the Society a certain number of Vice Presidents shall be elected annually.

11.—In case the President, and the Vice Presidents are absent at any Meeting, a quarter of an hour after the fixed time, the senior Member present shall take the Chair for the Evening.

12.—Every Member of the Society shall have the privilege of introducing as a visitor, any gentleman who is not usually resident in Calcutta.

13.—With a view to provide funds for the necessary expenses of the Society, an Admission Fee shall be established to consist of two gold mohurs, payable by every Member on his election, and each Member of the Society, resident in India (Honorary Members excepted) shall also contribute a gold mohur, quarterly, in the first week of January, April, July and October. Any Member neglecting to pay his Subscription for half a year, after it becomes due, to be considered as no longer a Member of the Society.

14.—All Members returning to India shall be called upon to pay their Subscription as usual from the date of their return.

15.—A Treasurer shall be appointed.

16.—In addition to the Secretary, an Assistant Secretary and a Librarian shall also be appointed.

17.—A Committee of Papers shall be appointed, to consist of the President, Vice Presidents, Secretary, and nine other Members to be elected annually, and any number no less than five, shall be competent to form a Committee.

18.—This Committee will select from the papers communicated to the Society, such as may appear proper for publication, and superintend the printing of the Society's Transactions.

19.—The Committee of Papers shall be authorized to draw upon the Treasurer for any sums requisite to defray the expense of publishing the Translations, and an order signed by a Majority of the Committee, will be a sufficient warrant to the Treasurer for paying the same.

20.—The Committee of Papers is authorized to defray any small contingent expenses on account of the Society which they may deem indispensable.

21.—Every Subscribing Member of the Society, on application, shall be furnished with a copy of such volumes of the Researches as may be published whilst he continues a Member, in return for his contributions, without any further payment.

22.—With a view to the more general circulation of the Asiatic Researches in India, the price of the 12th and future volumes, to Non-subscribers, shall be fixed at a gold mohur, and if several volumes of different years be purchased together, they shall be sold at 10 rupees each.

23.—The Agents of the Society in England shall be desired to purchase, and forward for the Society's Library, Books of Science and Oriental Literature, published in Europe, taking care that those purchases at no time exceed the funds arising from the sale of the Society's publications.

24.—The Committee of Papers shall be requested to furnish the Agents in Europe with such further instructions as may appear requisite for their guidance in the selection of books proper to be placed in the Library of the Society.

Library.

25.—The Library is open from 10 to 4 o'clock, between which hours, the Assistant Librarian is to be in attendance every day, Sunday excepted.

26.—None but the Members of the Society are allowed to borrow Books from the Society's Library, and no book is to be lent out of Calcutta without especial permission from the Committee of Papers.

27.—Books are to be borrowed by written or personal application to the Secretary; in either case, the person applying is to furnish a written receipt specifying the name of the work, and the time for which it is borrowed, at the expiration of which he is to return the book borrowed, or renew his application for an extended loan of it.

28.—The receipts for the Books shall be filed, and a Record kept of the Books lent out, to whom, and when lent out, and when returned.

29.—A list of the Books in the Library, and a Register of those lent out, are to be kept ready for inspection.

30.—All persons borrowing Books are to be answerable for their safe return, or are expected to replace them if injured or lost.

31.—The Librarian should be authorized to call in any work which is detained beyond the time fixed by the preceding rule.

32.—All works borrowed from the Library, should be returned once a year, viz. the first of October, in order to enable the Librarian to have the most efficient control over them, and to report to the Secretary on the state of the Library.

33.—Valuable manuscripts should not be removed from the Library, and no work from the Oriental division of the Library can be borrowed by Native gentlemen, not Members of the Society without a special order of the Secretary.

34.—All books being books of general or special reference in the various branches of Natural History in the departments of the Zoological, Geological, and Mineralogical Curators, to be understood by the Librarian to be Books of reference for the use of those officers, and as such, not to be lent out of the Library.

35—The Curators are farther to be allowed to take over for daily use, such Books as they may select for that purpose, giving the usual receipt to the Librarian.

Museum.

34.—On the 2nd February 1814, the Society determined upon forming a Museum for the reception of all articles that may tend to illustrate Oriental Manners and History, or to elucidate the particulars of Nature or Art in the East. The following Resolutions were at the same time passed upon the subject.

35.—That this intention be made known to the public, and that contributions be solicited of the undermentioned nature:—

1. Inscriptions on stone and brass.
2. Ancient Monuments, Mahomedan or Hindoo.
3. Figures of the Hindoo Deities.
4. Ancient Coins.
5. Ancient Manuscripts.
6. Instruments of War peculiar to the East.
7. Instruments of Music.
8. The vessels employed in Religious Ceremonies.
9. Implements of Native Art and Manufacture, &c. &c.
10. Animals peculiar to India, dried or preserved.
11. Skeletons, or particular bones of animals peculiar to India.
12. Birds peculiar to India, stuffed or preserved.
13. Dried Plants, Fruits, &c.
14. Mineral or Vegetable preparations in Eastern Pharmacy.
15. Ores of Metals.
16. Native alloys of Metals.
17. Minerals of every description, &c. &c. &c.

36.—That the hall on the ground floor of the Society's house be fitted up for the reception of the articles that may be procured. The plan and expenses of so doing to be regulated by the Committee of Papers and Secretary, and the person under whose superintendence the Museum may be placed.

37.—That the expense which may be incurred in preparing materials furnished in a state unfit for preservation be defrayed by the Society within a certain and fixed extent.

38.—All articles presented to the Museum shall be delivered in the first instance, to the Superintendent of the Museum, to enable him to make the acknowledgment, directed in the standing rules of the Society.

39.—A Register of Donations to the Museum, shall be exhibited each Meeting of the Society.

40.—The Committee of Papers shall adopt such means as may appear proper for making the intentions of the Society, in this respect, generally known.

41.—That the names of persons contributing to the Museum or Library of the Society, be hereafter published at the end of each volume of the Asiatic Researches.

Bibliotheca Asiatica.

The following Resolutions were passed on the recommendation of the Committee of Papers, under date the 2nd July 1806, but materials have not yet been received for publishing a volume of the work therein proposed.

42.—That the Society publish from time to time as their funds will admit of it volumes distinct from the Asiatic Researches, translations of short works in the Sanscrit and other Asiatic Languages, or extracts and descriptive accounts of books of greater length in those languages, which may be offered to the Society, and appear deserving of publication.

43.—That as this publication may be expected gradually to extent to all Asiatic books of which copies may be deposited in the Library of the Society, and even to all works extant in the learned languages of Asia, the series of the volumes, be entitled Bibliotheca Asiatica, or a Descriptive Catalogue of Asiatic Books with extracts and translations.

Physical Class.

The following Resolutions were passed on the 2nd January 1828:—

1.—That the Physical Committee of the Asiatic Society be considered as in existence and for the same purposes as formerly, exclusively of Medicine.

2.—That all Members of the Society, be Members of the Committee.

3.—That persons not belonging to the Society, may be elected as corresponding Members of the Committee, upon the recommendation of any three Members without being liable to any charge.

4.—That the Committee elect its own Officers.

5.—That the Committee frame its own rules, subject whenever likely to interfere with the Rules of the Society, to confirmation at a General Meeting.

6.—That the proceedings of the Society, and short notices of any interest, be published from time to time, as they accumulate, in such form as may be hereafter found convenient.

7.—That Papers of any extent or permanent interest, be published in the same type and form as the Researches, so as to admit of their being bound up with them.

8.—That the expense of these publications be borne by the Society.

9.—That the Physical department of the Museum be considered under the especial charge of the Committee, Mr. Tytler undertaking the care of the Osteological Specimens and Mr. Ross of the Minerals.

Translation Committee, 3rd September, 1828.

That a Committee of the Society be formed to communicate with the Committee of Translation of the Royal Asiatic Society, and carry their views into effect by procuring and transmitting such Manuscripts, Originals and Translations, as they may be able to obtain for the purpose.

That a Book be opened for Subscriptions of Ten Guineas per annum, each Subscriber; entitling him to a Copy of all the Works printed by the Translation Committee.

Proceedings of the Asiatic Society.—February, 1844.

(Tuesday, the 6th February, 1844.)

The Monthly Meeting of the Society was held on Tuesday the 6th of February, at the usual hour. The Honourable The President in the chair.

The Meeting was made special, to afford the Members an opportunity of expressing their sentiments on the departure of their old and talented associate B. H. Hodgson, Esq. late Resident at Kathmandoo, who was to embark that evening on board the *Earl of Hardwicke*.

Before commencing the business of the evening, the Honourable the President rose, and in the most feeling and impressive manner, addressed the Members to the following effect :—

"The daily Papers have informed you of the object of this Meeting, but it may be necessary to explain why it has been made special, particularly as to-morrow is the usual day, and it has been determined to adhere to that day except under very peculiar circumstances. On the present occasion, the circumstances are such as to make me feel confident that you will all concur in the propriety of what has been done. Mr. Hodgson sails to-morrow, and I am sure that there is not a Member here present who would not have regretted the loss of the only opportunity we shall ever have of seeing him in this place, and of testifying, as far as we are able, how highly we are sensible of the credit which his labours and researches have reflected on the Society. I am aware, that in alluding to them, I am causing to the distinguished individual of whom I am speaking more pain than pleasure, but I hope he will forgive me, for I feel that you would all consider me as ill discharging the duties of the situation in which I have the honor to be placed, were I to allow such an occasion as this to pass without referring to those labours and those researches in terms of suitable acknowledgement.

"I confess, however, that I am quite unable to speak of them as they ought to be spoken of, but of their variety and extent, you may yourselves be able to form some judgment, when you hear that Mr. Hodgson's contributions to the Transactions and Journal of this Society alone, according to a paper which I hold in my hand, amount to eighty-nine distinct papers.* This, however, is not the extent of the work accomplished by him. He has largely contributed to other scientific bodies as much by the benefit of his correspondence as by his direct contributions, and in addition

* See list in the following page.

to all the mass of research, and all the novelty of information of which evidence is before us in his detached papers, we possess the most valuable of all his works, his book on the literature and religion of the Boodhists, a work the most complete extant upon a subject till lately but little understood, and of the highest importance to the Philologist and the Historian. But this is not all; while engaged in the most difficult and important official avocations he has found time also to enrich our knowledge of Zoology by new observations on known animals, and a series of discoveries of novel ones. But it is unnecessary for me to dilate on these subjects, as all the particulars will be far better explained in the course of the evening by the other Officers of the Society. I will only further observe, that the high reputation which Mr. Hodgson has conferred on the Society, is not merely a local and an Indian one. His name, widely spread with his discoveries among the Scientific Societies of Europe, has carried with it corresponding credit to the Body, as a Member of which he had laboured, and which ought therefore to testify their acknowledgments in a mode creditable alike to their distinguished associate and to themselves.

The Hon'ble the President then proposed.

"That as a testimony of the high sense entertained by this Society of Mr. Hodgson's scientific and literary labours, and also as a mark of personal regard, he be requested to sit to some first-rate Artist for his bust, to be placed in its Public Meeting Room."

This motion was seconded by H. Torrens, Esq. V. P. and Secretary to the Society, and carried unanimously,

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B. H. Hodgson, Esq.

Contributions to Transactions and Journal, referred to by the Honourable the President.

1828, Account of Manufacture of Nepal Paper,
1829, On a new species of Buceros,
Antilope Hodgsonii. Notice of,
1830, Antilope Hodgsonii. On the,
1831, On the Antilope,
On a species of Felis,
On Scolopacidæ,
On Musk Deer,
On the Cervus Jarâi,
On the Ratwa Deer,
On the Jaral Goat,
On the Migration of Birds,
On the Chirû,
On the Mammalia of Nepal,
1832, Route from Katmandu to Gazedo,
Account of Manufacture of Nepal Paper,
Further illustrations of Antilope Hodgsonii,
Notes on the Cervus Jarai,
Remarks on the Buceros,
1833, On a New species of Buceros,
Description of the Aquila Nepalensis,
Description of the Cricætus Nipalensis,
Migration of the Natatores and Grallatores in Nepal,
On the Wild Goat and Wild Sheep in Nepal,
Description of the Ratwa Deer,
Description of the Buceros Homrai,
Description of the Wild Dog of the Himalaya,
Nipal Zoology,
On the Nepal Military Tribes,
1834, On the Chirû Antilope,
On the Newars,
On Bauddha Inscriptions,
On Buddhism,
On Ancient Inscriptions,
1835, Visit to Simroun,
On Tibetan Inscriptions,

On Sarnath Inscription,
Zoology of Nepal,
On Bearded Vulture,
On red-billed Erolia,
On Thar and Ghoral Antilopes of Nepal,
On Wild Goat of Nepal,
On Wild Sheep of Nepal,
On specific characters of Cervus,
On Nepal Mustela,
1836, On Falconidæ,
Synopsis of Mammals,
On Nepal Ornithology,
On Wild Goat,
On Zoological Nomenclature,
Description of Columba,
Sketch of Buddihsm,
On Ursitaxus,
On New Incessores,
On Charadriadæ,
On Falconidæ,
On Yunxinæ.
On Cerithiadæ.
On Hirundinidæ,
1837, On Indian Thrushes,
On Woodpeckers,
On Incessores,
On new genera of Sylviadæ,
On new genera of Raptores,
On new Scolopacidæ,
On Gauri Gau,
On new genera of Plantigrades,
On Language of Buddhist Scriptures,
On the Bibos, or Gauri Gau,
1838, On a Pheasant from Thibet,
1839, On Cuculus,
1840, Hare of Gangetic Provinces and of the Sub-Himalayas; with a slight notice of a strictly Himalayan species,
On the common Monkey; with remarks on genera Semnopitheceus et Macacus, three new species.
Nayakote. A cursory notice of,
1841, Note on the Cervus Elaphus of the Sâl Forest of Nepal,
On the Genera of the Bovinæ,
Glaucopinæ, or Rasorial Crows inhabiting the Northern regions of Nepal,
Conostoma Æmodeus Notice of a new form,
Lagomys inhabiting Nepal, with plate of a new species,
Mammals of Nepal. Classified Catalogue of to the end of 1841, first printed 1832,
Notice of Marmot of the Himalaya and of Tibet,
New organ in the Genus Moschus,
Classical Terminology of Natural History,
1842, Notice of the Mammals of Tibet, with descriptions and plates of some new species,
1843, Description of a new genus of Falconidæ,
Catalogue of Nipalese Birds, presented to the Asiatic Society, duly named and classified by the Donor,
Translation of the Naipalia Devuta Kalyana, with Notes,
Notice of two Marmots, inhabiting respectively the plains of Tibet and the Himalayan Slopes near to the snow, and also of a Rhinolophus of the central region of Nepal,
Additions to the Catalogue of Nepal Birds,
On a new species of Cervus—Cervus Dimorphé,

Books.

Illustrations of the Literature and Religion of the Buddhists,

The following Honorary Member proposed at the last Meeting by the Hon'ble the President, and seconded by the Secretary, was unanimously elected.

H. R. H. John, Prince of Saxony.

New Member proposed.

Lieut. Hopkinson, B. N. I. Assistant to the Commissioner of Arracan. Proposed by H. Torrens, Esq., seconded by Lieut. Phayre.

Read the following list of Books presented and purchased during the month of January:—

Books received for the Meeting of the Asiatic Society, on the 6th February, 1844.

Voyage dans L'Inde, par St. H. Theroulde. Paris, 1843, 8vo.—Presented by the Author.

Meteorological Register kept at the Surveyor General's Office. Calcutta, for the month of December, 1843.—From Government.

The Calcutta Christian Observer, February 1844.—Presented by the Editor.

The Oriental Christian Spectator, January 1844.—Presented by the Editor.

Proceedings of the Geological Society of London, vol. 4, No. 94.—Presented by the Society.

Journal of the Agricultural and Horticultural Society of India, No. 10, 1843, vol. 2d.—Presented by the Society.

The Calcutta Literary Gleaner, No. 10, vol. 2d.—Presented by the Editor.

The Annals and Magazine of Natural History No. 77, 78, 79 and 80.—Purchased.

The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, 3d series, No. 153, November 1843.—By the Editor.

A Catalogue of a valuable collection of books on Natural History, arranged in classes according to the Linnæan system by W. Wood.—By the Author.

Journal des Savants, Septembre 1843.—Purchased.

The Zoology of the Voyage of H. M. S. Sulphur during the years 1836-42.—Purchased.

Illustrations of the Zoology of South Africa by A. Smith, No. 18, July, No. 19, November.

Ruffee Buhur, [Persian,] presented to the Society by Nawab Oomdut-ool-Moolk, Bahadoor.

Ruffee-ool-Issahee, [Hindoostanee.]—Presented to the Society by Nawab Ooomdut-ool-Moolk, Bahadoor.

Read the following letter from J. Muir, Esq., C. S:—

To the Secretary to the Asiatic Society of Bengal.

Sir,—I beg to state for the information of the Committee of the Asiatic Society of Bengal, that I have returned to India, and that I have instructed my Agents, Messrs. Colville, Gilmore and Co. to recommence the payment of my Annual Subscriptions as a Member of the Asiatic Society.

I should feel obliged by your acquainting me, whether any progress has been made in the printing of the *Sarira Vidya*, a Sanskrit Translation of Hooper's Anatomist's Vade-Mecum, towards the publication of which I subscribed 1000 Rupees some years ago.

I have the honor to be, Sir,

Your most obedient servant,

Spence's Hotel, Calcutta, 29th January, 1844. J. Muir,

M. As. Soc. B.

The Secretary stated, that upon enquiry he had learnt from Dr. O'Shaughnessy, that 500 Rs. of the money subscribed by Mr. Muir had unfortunately been lost, having been remitted to Europe to cover the cost of wood cuts from Quain's Anatomy through the agency of Stocqueler and Co., whose bill was dishonored, and the amount irrecoverable. Mr. Muir had been assured, that the printing of the *Sarira Vidya* would be early brought under the consideration of the Society.

Read the following letters accompanying a small box of shells, addressed to James Prinsep, Esq., or Acting Secretary of the Society.*

Much honoured Sir,—You receive therewith a little box with shells destined for the Cabinet of the Asiatic Society. The enclosed letter shall mention you the further, should you be induced to make to me a remittance. Capt. *Meier's* ship *Auguste et Metdwe*, by which you receive this box, shall without doubt take care of your sending; otherwise you can make to me Sundries over London or Hamburgh, and address in the former place. Your boxes to Mr. *Tost*, care of the

* These letters are, it will be seen, printed.

ship's broker, *Cartemdyk*; but inform this gentleman by a letter, that the box is destined for me, and that he might account to me for the expences.

With the greatest respect,

Your most obedient servant,

G. Vodndem Busch, M. D.

Bremen, 20th Feb. 1842. *Member of the Board of Health, &c.*

Much honoured Sir,—It is already a long time that I received from you, care of Dr. Cantor, some shells from Bengal, for which I was very thankful to you. Sometime after the receipt of these shells, I sent a little collection of shells to Professor Wilson, to London, and I solicited him to take care, that it might come to your hands. Never I have heard if this sending has reached you, although I have inquired after it by Professor Wilson. Now as the rare occasion offers to myself that a ship sails from Bremen to Calcutta, I profit of it, and take the liberty to send to you some shells for the Cabinet of the Asiatic Society. I have selected principally the shells of our country, as I think that these shall be rare in Asia, and have adjoined some of American shells. If this sending should be agreeable to the Society, I would be very enjoyed, and shall continue to communicate to the Society from time to time some more shells. It would be very agreeable for me, if you would mention me, in what respect I can otherwise be useful to the body, and I give you the promise, that I shall do my possible to fulfil the desires of that learned Society. Now, my dear Sir, I solicit you to send to me once some shells of your interesting country. Besides the bed shells from the genus Helix, Bulimus, Achetina and Cyclostoma, I wish also to receive of the *Bivalves* and Univalves of fresh waters, and particularly agreeable for me would be specimens of the Genus *Melania*. I purpose merely, if I should be supported by my friends and correspondents in other countries, in procuring specimens of the said genus, to prepare a Monography of it. To your former sending I have received some very interesting and a large unknown species of Melania, which I have described already in a conchological work of our country. I wish now to multiply the specimens of the said genus, and to make them known to the naturalists. I doubt not, that many new shall be found in the waters of Bengal, and every new contribution shall be of value for me. You have sended to me also very fine but broken specimen of a new genus, similar to Paludina, also a specimen similar to Cyclostoma, which are very fine and interesting. Could you send me of these some more I should be very glad. Specimens of this shall also be welcome. One of the Helices I have received I call Podiceps, and on the other Hel. Bensoni, as the descriptions and name of Mr. Benson are not known in Germany.

If, dear Sir, I can be useful to you or the Society in sending minerals or other natural products, I shall fulfill your desires with pleasure, and I solicit only to give me up a secure way that I can send you such objects.

In the hope that my sending shall be agreable to the Society, and that you shall fulfill my desires. I have the honor to be,

Your obedient servant,

G. Vondem Busch, M. D.

Member of the Board of Health, and of various Scientific Societies.

Bremen, 20th Feb. 1843.

Read the following letter, accompanying the valuable paper to which it refers, which was ordered for publication in the Journal :—

No. 60 of 1844.

From P. Melvill, *Esq. Under-Secretary to the Government of India, to* H. Torrens, *Esq. Secretary to the Asiatic Society, Fort William, the 27th January* 1844.

Foreign Department.

Sir,—I am directed by his Honor the President in Council to forward to you, for such notice as the Society may consider it to merit, the accompanying Vocabulary of the Hinduvee dialect of Bundelcund, by Major R. Leech, C. B.

2nd. You will have the goodness to return the original document when no longer required.

I have the honor to be, Sir,
Your most obedient servant,

Fort William, the 27th January, 1844. P. Melvill,
Under Secretary to Government of India.

A continuation of Lieut. Baird Smith's Researches on Indian Earthquakes, was presented from that gentleman, and will speedily be published.

Read the following extract of a letter to the Secretary from Capt. Cunningham :—

Camp via Ambala, 20th January 1844.

"Can you scholars not come to any conclusion about the connection of the present and former religions of the East, as of the Brahmins, the Magi, and the Lamas? —Hom seems common to all under one modification or another.—The Tibetan "*Doongten*" or "*Doongtung*" is a place of the dead like the Guebre "*Dokmeh*"; and "*Lat*," a pillar of flame, and also an obelisk in the vernacular of India, is an object of worship in either sense in this country.—"*Lat*" was equally adored in Arabia, while words resembling it imply divinity or power, or superiority in Tibet and in other places."

Read the following letter from Dr. McCallum, accompanying the two Works to which it refers :—

To the Secretary to the Asiatic Society of Literature and Science, Calcutta.

Sir,—By desire of Nawab Oomdut-ool-Moolk Bahadoor, I have this day dispatched to your address, two Hindostanee Books translated from the English—one called Ruffee-ool-Bussur, and the other Ruffee-ool-Issahee, and beg you will kindly present them to the Society. The Ruffee-ool-Busser is a work not merely a translation, but some additions have been made to it from the Nawab's own observations.

I beg to remain, Sir,
Your most obedient servant,

D. McCallum,
Hyderabad, 2d Jan. 1844. *Sub-Asst. Surgeon, N. S.*

Read the following letter and note of charges from Mr. Blyth, Curator in the Zoological Department :—

My dear Sir,—I did not think to remind you this morning to send me the letters from F. Wilson and Capt. Cautley, as I wish to forward them to Huffnagle as soon as I can.

Herewith I send the memoranda I promised you of the expenses of the Zoological department of the Museum for the year 1843, exclusive of salaries. The expenses of last month have been unusually heavy, exceeding Co's. Rs. 200; the cost of spirits required being one of the heaviest items. It is only from October last that I have commenced regularly collecting fishes, a branch of zoology that involves the purchase of bottles and of spirit. A considerable number of sundry specimens have been forwarded by me to the Honorable Company's Museum as well as to various other institutions, the collecting and preparation of which enhances the immediate outlay of the Society, although, in the long run, I trust that we shall not be losers by this liberality. From the Honorable Company's Museum, however, to which the greatest number have been sent, and where a host of others are expected from me, I do not expect to receive much by way of exchange. You will also bear in mind that the more successful my exertions are in collecting desirable specimens, the cost of these will always be proportionate or, in the aggregate, about commensurate with that success; and I have certainly obtained many capital things lately. I may also further remind you, that the assistance liberally rendered by Government of 50 Rupees monthly for taxidermist's expenses, was allowed

previously to my taking charge of the Museum, since which time the expenses of our zoological department have of necessity, been so much increased. I wish you to urge these matters to the President at our next meeting,—kindly send Wilson's and Cautley's notes, and am

Yours truly,

February 6, 1844. E. Blyth.

Memorandum of expenses incurred in the purchase of specimens, and of sundries required for the preparation of them, including the cost of shikarees and of boys to assist the taxidermists, also of correspondents, &c. connected with the Zoological Department of the Museum for the year 1843.

January, ...	Co.'s Rs.	122	15 0
February, ...		81	10 9
March, ...		127	12 0
April, ...		151	4 3
May, ...		122	8 0
June, ...		162	1 0
July, ...		152	5 3
August, ...		103	14 0
September, ...		99	12 9
October, ...		79	10 3
November, ...		130	7 9
December, ...		160	11 0
	12)	1,495	0 0
Average, ...		124	9 4

Add to this the cost of the new cases for the Mammalia, also two new cases in the Bird Room, (holding Parrots, &c.,) and the new Insect cases.

Read the following extract from a private note to the Secretary :—

"I beg to call your attention to the existence of a volume in the Library of the College of Fort William, which I think might more properly be transferred to that of the Asiatic Society. The volume I allude to, is the manuscript original of the translation of the Dharma Shastru of Munoo, by Sir W. Jones; and a gentleman who was with me at the time that my eye fell upon this volume assured me, that he could safely pronounce it to have been written by Sir William himself; if such is the case, it certainly would be deposited with more propriety in the Library of a Society established by that distinguished individual himself, than in that of an establishment in no way connected with him. I have reason to believe, that there are other manuscripts connected with Oriental literature which ought to have been transferred to the Library of the Asiatic Society, which are still buried in the Library of the College of Fort William."

The Secretary was requested to make this the subject of a special representation to Government.

Report of the Curator Museum of Economic Geology and Geological and Mineralogical Departments for January, 1844.

Geological and Mineralogical.—Mr. Heatly has obliged us with some minerals from Jubbulpore, amongst which are some quartz geodes finely coated with green earth, a specimen of crystallised mica, and two of zeolites, which will be additions to our cabinet as varieties.

Mr. J. Dodd of the Mint, offers for sale a collection of 200 specimens of the fossils of the older Fossiliferous Rocks, which he procured recently from Berlin for his own researches in the neighbourhood of Agra, but does not now require. I have examined these, both with reference to the specimens themselves and to the prices usually charged by dealers at home, and should strongly recommend their purchase, as they are really much wanted for reference. We have nothing of the kind in the Museum, and the price asked by Mr. Dodd, 95 Rs., is not more than the cost and charges of such a series from respectable dealers.

To the Secretary to the Asiatic Society.

Dear Sir,—Last year when in the Upper Provinces, I ordered from Berlin a collection of Fossils found in the lower Fossiliferous Rocks, for the purpose of comparison with any I might obtain from the neighbourhood of Agra. The collection has just arrived, and as I have now no opportunity for applying it to the object I intended, I beg leave to offer it to the Asiatic Society for the sum it has cost me. The collection comprises 200 specimens, and the charge is 95 Rupees. I shall be very happy to send the specimens to the Society's Rooms, if you think it will be disposed to take them off my hands.

Yours obediently,

December 23, 1843. Jas. Dodd.

I may notice here, for it belongs specially to the department, the reception of a continuation of Lieut. Baird Smith's paper on Earthquakes for the Journal, and it is to be hoped, that from the wide circulation which these valuable papers will obtain, we shall be able to draw attention to these singular and often awful phenomena, with which, no doubt, so many of the changes of our globe are connected.

Museum of Economic Geology.—Capt. Hannay, Assam L. I., has contributed nine specimens of clays from the banks of the Dikho River in that country.

In searching through our Cabinets for other matters, I have met with a specimen of the beautiful green Jade, (axe-stone,) of New Zealand, to which I referred at the meeting of October. It is fortunately also marked with the name and locality, "Bigge, Suddiya," so we know that it is from Assam, and though only a pebble from the river, it is to be hoped we may find the vein or mass of it. Our zealous member, Captain Hannay, promises me to use his best endeavours to procure us specimens, as also of some very fine precious serpentine, which he says is to be obtained in very large blocks there. If these stones could reach Calcutta cheaply, they would be much prized, and probably valuable as exports to China, as the New Zealand Jade already is.

Mr. Hodgson, late Resident at Kathmandoo, has obliged us with a bottle of the water of the Gossainthan spring at 24.500 feet of elevation in the Himalayas. Upon a hasty examination I find it is of a light inky colour, and highly fetid smell, but no peculiarly disagreeable taste beyond that of the sulphuretted hydrogen, and that it contains sulphuretted hydrogen in considerable quantity, and traces of carbonic acid. A black flakey deposit is forming in it, probably bitumen and sulphur?

It gives no trace of iron or lime, muriates, or sulphates, and is thus probably a mere solution of bituminous and sulphureous matters. It is evidently decomposing, and this with its entire inaccessibility to us, render it not worth while to analyze it minutely, but I shall not fail to examine the deposit

Mr. Greenlaw, Secretary to the Superintendent of Marine, has obliged us with a few specimens of the copper ore, and another of the argentiferous lead ore of Adelaide, Australia.

Proceedings of the Asiatic Society.—March, 1844.

(*Wednesday Evening, the 6th March*, 1844.)

The usual Monthly Meeting was held on Wednesday evening, the 6th instant, at 8½ P. M. The Honorable Sir H. W. Seton in the chair.

Lieutenant Hopkinson, B. N. I., Junior Assistant to the Commissioner of Arracan, was duly elected a Member of the Society, and the usual notification was ordered to be made to him.

The following new Members were proposed; viz.

B. Colvin, Esq., B. C. S., proposed by E. C. Ravenshaw, Esq. C. S., and seconded by the Secretary.

W. Quintin, Esq. C. S., proposed by E. C. Ravenshaw, Esq. C. S., and seconded by the Sub-Secretary.

Read the following letter from Lady Rodd, accompanying the *Eloge* to which it refers:—

To the President and Members of the Asiatic Society, Calcutta.

Lady Rodd has had the pleasure of receiving a very gratifying letter from the President and Members of the Asiatic Society; in consequence of the flattering manner in which the Medallion of her revered father has been received, her Ladyship begs to offer a copy of the *Eloge* lately passed on Major Rennell by the Institute at Paris, who were so well able to appreciate the value of that celebrated man. Lady Rodd wishes to offer her sincere thanks to the President and Members of the Asiatic Society for their kindness in placing the Medallion in so honorable a position.

Wimpole Street, 27th December, 1843.

Read the following letter from B. H. Hodgson, Esq., late Resident at Kathmandoo:—

H. Torrens, *Esq. Vice-President, Asiatic Society.*

On board the Hardwicke, Saugor, Feb. 9, 1844.

Sir,—I request you will be pleased to convey to the President and Members of this Society my heartfelt regret that, never having before addressed a public body,

and being wholly unprepared for the honour and kindness lavished on me at the special meeting of Tuesday last, I found myself quite unable to do justice to those sentiments of pride and pleasure with which the Hon'ble the President's proposal, and the cordial reception it met with from the meeting, inspired me.

I cannot now hope to recover the lost opportunity of expressing my sentiments, but lest I should possibly seem wanting in a due sense of the distinction proposed to be conferred upon me, I beg leave to say, that every circumstance of the meeting of Tuesday last, is engraved upon my heart; that I contemplate the idea of my bust being placed in the Society's Hall as a proof of the regard and esteem of those who have known me so long, with inexpressible delight; and that so long as I live, the welfare of the Society will ever be the objects of my warmest wishes, and so far as may be, of my best endeavours.

I have the honor to be, Sir,
Your most obedient servant,
B. H. HODGSON,
Member, Asiatic Society.

Read the following list of Books presented and purchased during the last month:—

Books received for the Meeting of the Asiatic Society, on the 1st of March, 1844.

Journal of the Bombay Branch Royal Asiatic Society, No. VI. October, 1843.—Presented by the Society.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of January, 1844.—From Government.

Naturalist's Library, Ichthyology, Vol. VI. British Fishes.—Purchased.

Naturalist's Library, Ornithology, Vol. XIV. British Birds.—Ditto.

The Calcutta Christian Observer, March, 1844.—Presented by the Editors.

The Annals and Magazine of Natural History, No. 81, January 1844.—Purchased.

Read the following copy of a letter to be dispatched to Messrs. W. and H. Allen by the next Steamer.

Messrs. Allen and Co.—Special.

DEAR SIRS,—I am charged to press upon your immediate attention the following commission.

A bust of Mr. Brian Haughton Hodgson, B. C. S., having been voted by the Asiatic Society of Bengal, and that gentleman having left this country in the ship *Hardwicke* on the 7th instant, you are requested to place yourselves on receipt of this, in communication with Mr. Baily, Mr. Weekes, or Mr. Westmacott, the sculptors, or failing them, with the next eminent artist in sculpture, for the purpose of engaging his services for the work above noted. Having come to an understanding with the artist, I am charged by the Honorable the President and Members to request, that you will wait upon Mr. Hodgson on his arrival in England, (learning his address at Messrs. Coutts and Co.) and learn his wishes as to sittings for the bust.

You are requested to draw on the Society for advances and charges connected with the work, and the Honorable the President directs me to express his strong personal desire that you will gratify the Society by giving this matter your best attention.—Cost of the bust understood to be *not over* Guineas 150.

I am, &c.

Calcutta, 7th March, 1844. H. Torrens,

Vice President and Secretary Asiatic Society of Bengal.

Read the following letter from the Officiating Secretary to the Government of India, sanctioning payment for the copies of the reprint of Lieutenant (now Major) Leech's Beloochy and Brahooi Vocabulary and the over-copies of Capt. Eastwick's Scindee Vocabulary.

No. 131 of 1844.

From T. R. Davidson, *Esq. Officiating Secretary to the Government of India, to* H. Torrens, *Esq. Vice President and Secretary to the Asiatic Society.*

Foreign Department.

Sir,—In reply to your letter dated 26th ultimo, I am directed to inform you, that His Honor the President in Council has been pleased to pass the two bills submitted by Mr. Ridsdale of Bishop's College Press, amounting in the aggregate to Company's Rupees 124, for printing on account of Government, 150 copies of Lieutenant Eastwick's Vocabulary of the Scindee Language, and 150 copies of Lieutenant Leech's Grammar of the Brahuiky, Beloochee and Punjabee Languages. The necessary instructions will be issued through the Financial Department for the payment of that sum from the General Treasury to Mr. Ridsdale's receipt.

T. R. Davidson,

Fort William, 24th Feb. 1844. *Offg. Secy. to the Govt. of India.*

Read the following letter from the Secretary to the Royal Bombay Branch of the Asiatic Society :—

To the Secretary of the Asiatic Society of Bengal, Calcutta.

Sir,—With reference to my letter of the 7th September last, and by desire of the Bombay Branch of the Royal Asiatic Society, I have the honor to enclose bill of lading of a box shipped on board the *Framjee Cowasjee,* Captain Edwards, for Calcutta, containing copy of the Izashní and Visparad, of each of which 25 copies only have been lithographed at the expense of the Society, which you will be so good as to present to the Asiatic Society of Bengal. The box also contains 72 Geological specimens, some of which are of considerable interest.

The enclosed separate list will be of use in assisting the Curators in the arrangement of such of these specimens as may be found to deserve a place in the Museum, the fossils having been named with considerable care.

Another box will be prepared in a short time.

I have the honor to be, Sir,

Your most obedient servant,

John G. Malcolmson,

Bombay, Asiatic Society's Rooms, 9th Feb. 1844. *Secretary, B. B. R. A. S.*

Read the following letter from Moulmein; the book to which it refers was not obtained in time for the Meeting, having been sent to the Agricultural Society by mistake.

To the Librarian of the Asiatic Society, Calcutta.

SIR,—I do myself the honor of enclosing an order for a copy of the Maulmain Almanac and Directory for 1844, as also for a Plan of Maulmain, which I have been induced to compile in consequence of there being no work of the kind here, and the advantage it would be likely to confer upon the community, although a task of this nature is altogether out of my line of life.

Please accept of the work for the use of the Members of the Society.

I have sent it along with a few other copies to the care of Mr. Black, upon whom the order is.

I am, yours most obediently,
GEO. EYRE BARR.

P. S.—A few copies of the Work and Plan are sent for sale to Messrs. Ostell and Lepage.

Read the following letter from Dewan Horeemohun Sen, addressed to the Sub-Secretary: —

To H. PIDDINGTON, ESQ. &c. &c. &c.

MY DEAR SIR,—Here is a work compiled by Baboo Goorooprushad Roy, a very respectable gentleman and scholar. It is a Sanscrit and Bengalee Dictionary, or more properly speaking, an Encyclopedia, which has cost the author a great deal of labour and time, and much talent is, no doubt, displayed in it. The opinion passed upon this work by the learned Pundits here is highly favourable, as they consider it not only a very talented production, but particularly useful to persons learning Sanscrit and pure Shadhoo Bhasha Bengalee. I give him this note to you at his particular request; his object being to ask the favour of the Society's helping him, if convenient, to print and publish it for the benefit of those who apply themselves to the study of Sanscrit. He thinks that you can obtain for him some subscribers in Europe, where Sanscrit is held in estimation, such as France, Germany and England, &c. If you could therefore give him a helping hand, you would oblige,

Yours very sincerely,
HOREEMOHUN SEN.

Bank of Bengal, the 14th February, 1844.

The specimen of the work accompanying the letter was thought highly satisfactory, and the Secretary was requested to make further enquiry as to the cost of printing, &c.

Read the following extract of a letter from V. Tregear, Esq., accompanying a Meteorological Table for 1843, kept at Pussewa near Jounpore.

My dear Sir,—I have the pleasure to send you a Meteorological Register kept at Pussewa, (12 miles east of Jounpore,) during the year 1843, which you may think worth putting in the Journal.

Jounpore, 14th February, 1844. Vincent Tregear.

The Table was referred to the Editors of the Journal.

The Secretary brought to the notice of the Meeting two books; viz.

British Moths and British Butterflies, by Westwood and Humphries, of which, at the request of the Zoological Curator, he recommended the purchase, which was sanctioned accordingly.

Read the following letter from the Curator Mineralogical and Geological Department:—

H. Torrens, Esq. *Vice President and Secretary, Asiatic Society.*

Sir,—I beg to represent to you the urgent want of two more cases for our Mineralogical, and two more for our Geological collections.

You have yourself witnessed the crowded state of our valuable Mineralogical Cabinet, and I may add, that I find it next to impossible to proceed with the heavy task of arrangement without the room in which to arrange. I have large stores to add yet to both the Mineralogical and Comparative Geological Cabinets, for which the four cases now applied for will be but barely sufficient, so that even with them, the utmost management will be required to do justice to our treasures.

I estimate the expense at about 60 Rs. each case, probably something below it.

H. Piddington,

Curator Museum Economic Geology and of Mineralogical and Geological Departments.

Museum, 6th March, 1844.

The purchase of the cases was sanctioned by the Meeting.

Read the following—

REPORT OF THE CURATOR MUSEUM OF ECONOMIC GEOLOGY AND GEOLOGICAL AND MINERALOGICAL DEPARTMENTS.

We have but little to report upon this month, having had few contributions, and my own time being occupied with current arrangements, and with my report on the Cheduba specimens, which requiring many investigations, is not yet finished.

The Society will however hear with pleasure, the following letters from Government:—

No. 91.

From T. R. Davidson, Esq. *Offg. Secretary to the Government of India, to* H. Torrens, Esq., *Secretary to the Asiatic Society, dated the 27th Jan.* 1844.

Home Department.

Sir,—With reference to the application of the Asiatic Society, bearing date the 1st of July 1842, I am directed by the Honorable the President in Council to transmit to you the annexed copy, Paragraph 2, of a Despatch from

the Honorable the Court of Directors, No. 17 of 1843, dated the 1st November, together with Captain Herbert's Geological Map of the Mountain Provinces between the Sutlej and Kalee therein alluded to.

I am, Sir,
Your obedient servant,
T. R. DAVIDSON,
Offg. Secy. to the Govt. of India.

Council Chamber, the 27th Jan. 1844.

Extract from a Despatch from the Hon'ble the Court of Directors in the Public Department, dated the 1st November, 1842. *No.* 17.

Answer to Letter, dated 20th July, No. 32 *of* 1842.

Requesting the Court to send copies of Capt. Herbert's Geological Map, and 12 colored Views of the Himalayah for the use of the Asiatic Society.

2. We enclose as a number in the packet, a copy of Captain Herbert's Geological Map of the Mountain Provinces between the Sutlej and Kalee; but have not thought it necessary to incur the expense of procuring copies of the Views, which are large colored drawings of Scenery, and of no value in a scientific point of view.

(True Extract,)
T. R. DAVIDSON,
Offg. Secy. to the Govt. of India.

I have now the gratification of exhibiting the Geological Map to which it refers, and of congratulating the Society upon its having been able, through the kind attention of Government and the Honorable the Court of Directors, to render to the memory of one of their most zealous Members, and most earnest and laborious Indian men of science, Captain Herbert, full, though tardy justice; and in doing this also, it may claim at the same time to have rendered a most essential service to the cause of geological science, in giving to the world a connected Geological Map of this part of our great mountain barrier; for however deficient it necessarily is in details, and however much there may remain to be filled up, we have still here such a leading sketch of its main features by a scientific explorer, as will be invaluable to future observers; and I cannot better illustrate this opinion, than by requesting the attention of the Meeting to our two Geological Maps of England. The one but a little further improved than that of William Smith, the father of English Geology, after twenty years of assiduous and unassisted labour; and the other, Mr. Greenough's, the fruits of the combined knowledge and labours of all the geologists of England in twenty years more. It will be seen from these two examples how valuable, and in fact how indispensable, these preliminary sketches, like the first chalk or charcoal lines of the painter, are to the production of a finished work; and finally, we shall now, it is to be hoped, completely rescue Captain Herbert's labours from oblivion, (and even from misrepresentation,) and render justice to the liberality of the Government of India of that period in undertaking this great and most useful work.

Museum of Economic Geology.—We have received in this department, but without any letter, three sets of two Maps each, of the country through which the proposed

Rajmehal Canal is to pass, with the supposed limits of the Gangetic Alluvium. I do not know if any Geological Report was made on this interesting tract of country, but shall not fail to enquire and to obtain its publication if possible.*

Mr. Black has obliged us with a Report on, and impressions from, the Lithographic Stones sent down by Captain Shortrede.

H. Piddington, Esq.

Dear Sir,—In reply to your note of this morning I beg to inform you, that Mr. Blechynden has received the copy of the Moulmain Almanac intended for the Asiatic Society's Rooms; and with reference to the Stones, I have pleasure in forwarding two proofs taken off from impressions on each, but regret much I cannot give you so favorable an account of them as some of the former ones, as I find Nos. 1, 2, 3, 4, 5, 6 and 7 too soft, and No. 8 too hard, more resembling marble. This last is one of the two you left with me, before those you left in the box. The little blue piece is by far too soft.

Asiatic Lithographic Press, Thos. Black.
No. 3, *Hare Street, 4th March,* 1844.

It would thus appear, that none of these are equal to the former fine specimen, as might well occur when a number are taken at random from a heap of fragments quarried for building purposes; for in the German quarries also it is only from certain beds near Munich that the fine Stones are procured, and it is to this that, in part, their high price is owing. This matter however, is well worthy of a special recommendation to Government from the Society, since we are certain that a really good Stone exists, and have so near the spot an active, intelligent and zealous co-operator, like Captain Shortrede.

I have added to our collections specimens of the common Corundum Stone of the Bazar, with the powder of which all the cutting, grinding and polishing work of precious Stones is performed; even the Diamond is averred to be cut and polished by it, and it seems certain, that the use of Diamond powder is not known to the natives; or if known, that its expense prevents its adoption, or that the Indian lapidary finds his own process practically the best.

I find upon trial that the Corundum, would certainly cut every thing below the Sapphire in hardness, and no doubt *polish* the Sapphire, and I believe that if better known in Europe, it would be found of high value in the arts, and in many instances, (I speak here upon very competent authority,) reduce the prices of many very expensive processes, such as that of grinding hard steel pivots and plates, gems for lenses and the like, for which only Diamond powder can now be used, and the expense of this is often completely a prohibition on its employment, or adds enormously to the cost of the article. I have placed upon the table from our own collection nine specimens of the Stone, beginning with the Emery of Naxos, and ending with the crystallised rose Corundum of Ceylon.

* I have since learned from Colonel Forbes that no Geologist was attached to the Survey. Borings were made, and wells sunk along the line, and a series of specimens also collected from the adjacent rocks, *but it is not known what became of them!*

I have recommended a gentleman in this line of business, who left Calcutta a short time ago on the *Hindostan*, to take home a quantity of these stones for trial, and I have also ordered a quantity of them to be sent to England.

H. PIDDINGTON.

With reference to the suggestion of the Curator on the subject of Captain Shortrede's Lithographic Stones, the Secretary was requested to address Government on the part of the Society to that effect.

For all the foregoing presentations and communications the best thanks of the Society was voted.

Proceedings of the Asiatic Society.—APRIL, 1844.

(*Wednesday Evening, the 3rd April*, 1844.)

The usual Monthly Meeting took place on Wednesday evening, the 3rd of April. The Honorable the President in the chair.

The following new Members were ballotted for and declared duly elected:—

B. Colvin, Esq. C. S.

W. Quintin, Esq. C. S.

The usual communications were ordered to be made to them.

The following list of Books presented and purchased was read:—

Books received for the Meeting of the Asiatic Society, on the 3rd of April, 1844.

Annaler for Nordiske Oldkyndigheid, 1840-41 and 1842-43. Kjobenhavn. Presented by the Society of Northern Antiquarians, 2 Nos.

The Edinburgh New Philosophical Journal, July to October, 1843. Presented by the Editor.

Mémoire sur la Découverte de L'Amerique, par Charles Christian Rafn. Copenhagen, 1843. Presented by the Society of Northern Antiquarians.

London, Edinburgh, and Dublin Philosophical Magazine, third series, No. 151-152, October 1843. From the Editors.

Journal Asiatique ou Recueil de Mémoires, quartième série, tome I, No. 4, Avril. No. 5 Mai tome II, No. 7-8, Julliet et Aout. Presented by the Society.

Royal Asiatic Society of Great Britain and Ireland Anniversary Meeting and Twentieth Annual Report of the Council. London, 1843. Presented by the Society.

List of Members, Committees, &c. of the Royal Asiatic Society of Great Britain and Ireland, 1843. Presented by the Society.

Die Königliche Gesellschaft für Nordische Alterthumskunde. Jahresversammlung, 1842. Copenhagen. Presented by the Society of Northern Antiquarians.

Leitfaden zur Nordischen Alterthumskunde. Copenhagen, 1837. Presented by the Society of Northern Antiquarians.

The Oriental Christian Spectator, second series, March 1844, vol. V. No. 3, Editor.

Bullétin de la Société de Géographie, deuxieme série, tome XIX. Paris, 1843. From the Society.

Proceedings of the Geological Society of London, vol. IV, part I, 1843, No. 93. Presented by the Society.

Proceedings of the Royal Society of Edinburgh, 1843, No. 22. From the Society.

Royal Society of Northern Antiquarians. Copenhagen, 6 Nos. Presented by the Society.

The Yacna of the Parsis in the Zend language, but Gujarátí character, with a Gujarát translation, paraphrase and comment, by the late Framji Aspandearji. From the Bombay Branch Royal Asiatic Society.

The Bispard of the Parsis in the Zend language, but Gujarátí character, with a Gujarátí translation, paraphrase and comment, by the late Framji Aspandearji. From the Bombay Branch Royal Asiatic Society.

Notice Historique sur la Vie et les Ouvrages de M. le Major Rennell, par M. le Baron Walckenaer. From the Author.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of February 1844. From the Surveyor General's Office.

Transactions of the Royal Society of Edinburgh, vol. xv, part iii. From the Society.

Journal des Savants. Paris, Julliet et Aout 1843. Purchased.

The History of the Mohammedan Dynasties in Spain, translated by Pascal de Gayangos, vol. ii. Printed for the Asiatic Society by the Oriental Translation Fund.

Les Sultans Mamlouks de Makrize, tome ii, lib i. Printed for the Asiatic Society by the Oriental Translation Fund.

The Calcutta Christian Observer, April 1844. New series, vol. v. No. 52. Presented by the Editors.

Pritchard's Natural History of Man. London, 1843. Purchased.

Researches into the Physical History of Mankind, by J. C. Prichard, vols. i, ii, iii, Purchased.

Mémoires de la Société Royale des Antiquaires du Nord, 1840-43, Section Asiatique. Copenhagen, 1843.

Read the following letter from the Society's London Agents, Messrs. Allen and Co.:—

H. Torrens, Esq. *Secretary to the Asiatic Society of Bengal.*

Sir,—We have the pleasure to acknowledge the receipt of your favor of the 17th November last, enclosing a bill of lading for six cases of books, which are to be forwarded as addressed, and we are requested to transmit receipts for the same to the Society. We shall have much pleasure in attending to your instructions. We doubt if we shall be able to obtain receipts for all the cases, but if we can assure the Society that they are duly delivered, we conclude that will be quite satisfactory.

London, January 30, 1844.

W. H. Allen and Co.

Read the following correspondence with reference to the transfer of the Buchanan MSS. and Drawings from the Botanic Garden to the Library of the Society:—

The Secretary to the Government of Bengal, Home Department.

Sir,—I am instructed on the part of the Asiatic Society of Bengal to beg, that you will submit to the Honorable the Deputy Governor of Bengal, the respectful request

of its Members, that His Honor will be pleased to order the Buchanan Drawings and MSS. now deposited at the H. C. Botanic Garden to be placed in the Society's Library.

The vast amount of knowledge in almost all its branches, relating to India, contained in these volumes, and the great expenditure to Government at which it was obtained are well known, while it is not less notorious, that partly from non-publication and partly from its almost entire inaccessibility as now deposited, this noble monument of the solicitude of the Government of India for the development of its resources has been hitherto a sealed book to the public. In order to remedy, however late, this long existent evil, the Society begs earnestly to press upon his Honor's consideration the advantage that may arise from placing such resources within the reach of all who may desire to profit by them; and this His Honor may perhaps incline to allow, might be best done by placing the drawings and documents above alluded to for general reference in the Museum of the Society; where they will be available to its officers in the several departments of science for reference and comparison.

The Society would engage to make use of this valuable material for the *public* benefit, adding to the value of its own publications by selections from the mass of the Buchanan documents, which it is hoped His Honor may gratify the Society by placing in its charge and custody.

H. Torrens,
Vice-President and Secretary, Asiatic Society.

No. 798.

From Under-Secretary to the Government of Bengal, to the Vice-President and Secretary, Asiatic Society.

Sir,—With reference to your letter of the 26th January last, I am directed to transmit the enclosed copy of one from the Officiating Superintendent of the Honorable Company's Botanic Garden, No. 10, of the 13th ultimo, and to intimate, that his Honor the Deputy Governor has no objection to allow the Buchanan Drawings and Manuscripts to be temporarily deposited in the Library of the Asiatic Society, on the conditions therein stated, and has given directions to that Officer to forward them to you accordingly.

I have the honor to be, Sir,
Your most obedient servant,
A. Turnbull,
Under-Secretary to the Government of Bengal.

Dated Fort William, 25th March, 1844.

No. 10.

From W. Griffith, Esq. *Offg. Supt. H. C. Botanic Garden, to* A. Turnbull, Esq. *Under-Secretary to the Government of Bengal.*

Sir,—I have the honor of acknowledging the receipt of a letter from the Secretary to the Asiatic Society to the Secretary to the Government of Bengal, Home Department, on which I am desired to report.

2. It appears to me that there can be no objection to placing these very valuable Manuscripts and Drawings in the custody of the Asiatic Society, until such time as that Society shall have completed their publication or copies of them. But I think it should be understood, that this institution is the proper place of their permanent deposit, it being that of the Manuscripts and Drawings of Dr. Roxburgh, as it ought to be of those of all other Superintendents.* In this manner only can the series be kept complete, and each series can in this manner only guide Government to an opinion of the relative merits of the Superintendents it permits to hold this high scientific appointment. To this the almost entire inaccessibility alluded to in the Secretary's letter cannot be objected, that assuredly was never contemplated by Government, and has not existed since 1836, when it was removed by Dr. McClelland, and Government having shewn its anxiety to secure ready publication of documents, it assuredly cannot again be restored.

3. It would have been very desirable that this application had been made to Government when the fact of the Drawings and Manuscripts being here was first made known. For since that, I believe, the Society has been the means of making known zoological labours which would, had the Society's attention then been attracted prominently to these Manuscripts, &c. have been found to have been anticipated by Dr. Buchanan. The Society at this period cannot attach priority to the works of Buchanan.

4. It also appears to me desirable, that if Government decides on lending these Manuscripts and Drawings to the Society, it should be on the engagement proffered by the Society in the last paragraph of the Secretary's letter, and in exclusion of paragraph 2d, otherwise a stigma will be attached to this institution, which, as it is a public institution of Government, endowed in a liberal manner, and presumably superintended in a liberal and open manner, it cannot *in se* be considered to merit.

5. Pending the receipt of his Honor's final instructions, I shall construct a complete catalogue of the Manuscripts and the Drawings to be retained here for the information of Government.

I have, &c.

Honorable Company's Botanic Garden,
13th February, 1844.

(Signed) W. Griffith,
Offg. Superintendent.

(True Copy,) A. Turnbull,
Under-Secretary to the Government of Bengal.

The Secretary called the attention of the Meeting to the alteration which had been made in the height of the pedestals on which the busts were placed; three of them having been reduced and the busts placed upon them for inspection. The alteration was approved of.

* We doubt much if Dr. Buchanan was ever a Superintendent of the H. C. Botanic Garden ? —Ed.

Read the following letter addressed to the Sub-Secretary, by the Rev. J. J. Moore, Secretary, Agra School-Book Society :—

No. 162.

H. Piddington, Esq. *Asiatic Society's Rooms, Calcutta.*

My dear Sir,—Kindly excuse the trouble I am giving you, but will you send me a copy of all the Hindi and Sanscrit works the Asiatic Society may have for sale. They are intended for a Native Prince, and it is particularly requested, that each copy be neatly bound. They are intended for Maharaja Tukht Sing of Marwar. Maps in Hindi or Sanscrit would be also most acceptable. For the expense which may be incurred, I shall be responsible to the Society. It would be desirable if they could be forwarded under a frank, and as this privilege is allowed to Government Educational Establishments, probably in a case like the present, a similar indulgence would be granted. At all events do not let this be a bar to the transmission of the books for the Rajah.

I intend to publish an edition of the Rekha Ganita, in the Sanscrit Version of Euclid by Raja Savai Jai Sing. I understand there is a copy in the Society's Rooms which had been corrected by the late Jas. Prinsep; it would aid me very much could it be procured for the purpose of collating my MSS. with it.

25*th March*, 1844. J. Moore,
Secretary, Agra School-Book Society.

P. S.—Kindly also favour me with a few copies of the list of the Society's Books which may be for sale.

The Sanscrit works published by the Society were ordered to be forwarded, bound as requested. Upon inquiry it does not appear that the MSS. alluded to is in the Society's Library; the only copy of the Rekha Ganita, being one by Jaganath Pundit; but it was subsequently ascertained that *the* valuable copy of the Rekha Ganita, alluded to by Mr. Moore, was in the Library of the College of Fort Willam, and he was informed that a copy would be sent him if desired.

A recommendation of the purchase of several works, and a proposal to purchase a female Gayal now at Chittagong, were submitted by the Zoological Curator, which last was authorized.

Read the following letter from J. W. Roberts, Esq. accompanying the specimens alluded to :—

H. Piddington, Esq.

Dear Sir,—I have the pleasure to send you for the Asiatic Society, a few Locusts of the legion that did so much mischief to the past season's indigo crop. They are from Nudjuffghur, near Cawnpore.

When at the Museum a few days ago, I did not perceive amongst the natural curiosities any specimen of this enemy to the vegetable kingdom, and they may not therefore prove unworthy of reception.

Calcutta, 13th March, 1844. J. W. Roberts.
No. 14, *Writers' Buildings.*

P.S.—I send them as received, preserved in Cognac brandy.

Read the following letter from J. Owen, Esq., accompanying the Arms presented by that gentleman :—

To H. Torrens, Esq. *Secretary, Asiatic Society.*

Sir,—I have the honor to forward herewith certain arms taken from the chiefs who were creating the disturbances at Ningroo during the past year. No. 1 is a Naga Dao, and No. 2 a Singphoe one.

The Society's acceptance of the same will confer honor on

Yours faithfully,
On the River, 19th March, 1844. J. Owen.

Report of the Curator Museum of Economic Geology and Geological and Mineralogical Departments, for the month of March.

Geological and Mineralogical.

Our zealous correspondent Captain Newbold, Assistant to the Commissioner, Kurnool, has sent us from Beypoor, near Calicut, a specimen of the lignite of the beds of that locality which, he thus describes.

"By to-day's banghy I have the pleasure to forward to the Society a specimen of the lignite from a bed of considerable extent in the laterite sandstone near Beypoor, in the vicinity of Calicut, on the Western Coast, discovered by myself in 1840. It is associated with sulphur, sulphates of alumina, iron, retinasphalt and mineral coal. The shales immediately in contact have a rarely perceptible dip, are black, carbonaceous and aluminous, and contain scattered spangles of mica. The bed of lignite itself is from one to three feet thick, and can be traced about half a mile up the river. General Cullen recently writes me, that he now sees much of this carbonaceous deposit in Travancore, and that it is very extensive. It exhibits itself in beds of black clay and lignite of considerable thickness in the laterite cliffs along the W. Coast from Quilon to Venkully. Deposits of the same kind occur about the same level at the distance of two or three miles inland."

We have to acknowledge from Government, a further addition to our knowledge of the Cheduba group in a report from Lieut. Hopkinson, Assistant Commissioner, Arracan, who was also sent by the Commissioner, Capt. Bogle, to examine the spot where the Volcanic Island had appeared, and who, though he unfortunately was not acquainted with Mineralogy or Geology, has most zealously fulfilled his mission. His report will be incorporated in mine, and I may remark here, that several of his specimens are of very considerable interest.

The following are the letters from Government and from Mr. Commissioner Bogle:—

No. 687.

From Under-Secretary to the Government of Bengal, to the Secretary to the Asiatic Society.

Sir,—I am directed to transmit to you, copy of a letter from the Commissioner of Arrakan, No. 453, dated the 16th December last, and of its enclosures, relative to the visit paid by Lieut. Hopkinson, the Senior Assistant at Sandoway, to the site of the Volcanic Island which recently appeared for a time to the south-east of Cheduba, together with a box containing the geological specimens referred to in the fourth paragraph of Capt. Bogle's letter.

Cecil Beadon,
Under-Secretary to the Government of Bengal.

Fort William, 11th March, 1844.

(Copies. No. 453.)

From Capt. A. Bogle, *Commissioner in Arracan, to* T. R. Davidson, Esq., *Secretary to the Government of Bengal, General Department.*

Sir,—Capt. Williams, Senior Assistant Commissioner in charge of Ramree and Cheduba, having in a letter dated 11th August 1843, No. 1828, copy of which is annexed, intimated to me that a volcanic eruption had occurred off the S. end of "False Island" in the end of July last, and that an Island had been formed on the spot, without however conveying to me any of the particulars, I considered it proper to write to him immediately to furnish me with the fullest information on the subject.

2. In reply he acquainted me, that it was wholly impracticable to approach "False-Island" during the S. W. Monsoon, and that the difficulties opposed to all communication with "Flat Island" or "Regweng," from whence the eruptions had been observed, were of such a nature, as to preclude the hope of being able to obtain any further information before the close of the rains.

3. As both the above islands are exposed to the full force of the Monsoon, and are surrounded by innumerable dangers, it appeared to me by no means justifiable to endanger life by endeavouring to conduct any inquiries prior to the termination of the tempestuous season; but in the month of October, I determined to depute Lieut. Hopkinson, Junior Assistant Commissioner, an officer of much intelligence and enterprize, to visit the site of the reported eruptions as soon as the state of the weather in the Bay of Bengal would admit of his proceeding to sea in one of the small Government Schooners belonging to this province, and on the 21st of that month, I accordingly addressed him letter No. 839, of which a copy is appended.

4. Immediately on its receipt, Lieut. Hopkinson proceeded to the spot, and having made a full and diligent inquiry regarding the interesting circumstances reported, and taken a survey of "False-Island," he has now favored me with a report under date the 25th ultimo, No. 86, of which I beg leave to transmit a copy, together with his Map of the "False Island," for submission to the Honorable the Deputy Governor of Bengal; and by the next trip of the "*Amherst,*" I shall not fail to forward the different geological specimens which accompanied Lieut. Hopkinson's report.

5. As the newly created island, which, even if it had really existed, could never I apprehend have been any thing more than a mass of rock, has disappeared, and no apparent change has been occasioned by the eruptions, Lieut. Hopkinson found but little worthy of mention; but I nevertheless feel greatly indebted to him for the promptitude with which he repaired to the spot, and for the very satisfactory manner in which he has completed the duty entrusted to him, and I trust that his report and map will meet with His Honor's approval.

6. I am aware that much of the interest which attached to these volcanic eruptions may have ceased on the return of the "*Ganges*" Steamer from her recent visit to this coast, but still I think it due to Lieut. Hopkinson, that the endeavours previously made by him to collect the fullest information regarding them, should be submitted to the Deputy Governor, and that his Honor should be satisfied, that such remarkable changes are not regarded with indifference here.

A. BOGLE,
Commissioner in Arracan.

Arracan Commr's. Office, Akyab, 16th Dec. 1843.

No. 1828.

To Captain A. BOGLE, *Commissioner in Arracan and Akyab.*

SIR,—I have the honor to acquaint you, that the Soogree of "Flat Island" reports, that on the 26th, 27th, 28th, and 29th of July, a Volcano broke out a short distance, (30 bamboos, 360 feet,) he mentions, south of "False Island," and that a new Island has been formed on the spot.

D. WILLIAMS,
Senr. Asst. Commissioner.

Arracan S. A. Commr's. Office, Ramree, The 11th August, 1843.

(True Copy.) (Signed) A. BOGLE,
Commissioner in Arracan.

From the Rev. Mr. Barbe, Roman Catholic Missionary at Chittagong, we have received a box of specimens of the ferruginous sandy breccias, conglomerates and concretions of that place, some of them much resembling those sent up, I think, in 1838, by Mr. Sconce, Magistrate of that district, and of petrified wood and lignite from the same quarter. We have unfortunately no details of the locality with these specimens.

Museum of Economic Geology.

From the Bombay Branch R. A. S. Society, we have received a second box of 72 specimens for this department, and for that of Mineralogy and Geology, for which our best thanks are due. As the list is instructive, and it is always useful to have them on record, I have inserted it here.

List of Geological Specimens from Western India, presented to the Museum of the Asiatic Society, Calcutta, 2d series.

No. 1. Calcedony with Calcspar, Rajcote.
,, 2. Altered sandstone, Kattiawar.
,, 3. Jasper, Waukaneer, ditto.
,, 4. From near Rajcote, ditto.
,, 5. Altered sandstone, Waukaneer, ditto.
,, 6. Marble (magnesian) of which Hoossain Shah's tomb is built, Mandoo, Malwa.

No. 7 to 8. Basalt from between Mandoo and Mhow.
,, 9. Calcspar from Basalt, between Malwa and Mhow.
,, 10 to 29. Minerals from between Mandoo and Mhow.
,, 30 to 31. Basalt, Mazagon, Bombay. This takes a good polish, and is used for pedestals of statutes, &c.
,, 32. From Balmeer hill.
,, 33. ,, Ditto.
,, 34. ,, Ditto.
,, 35. ,, near Balmeer.
,, 36. Gypsum, near Balmeer.
,, 37. From Vindiah hills.
,, 38. From whitish Basalt Rock, Parell, Bombay.
,, 39 to 42. Recent formation, Allibaugh, Angria, Colaba.
,, 43 to 45. Ditto ditto.
,, 46 to 47. Ditto ditto.
,, 48. Basalt, ditto.
,, 49. Piece of Rock from near Bhooj.
,, 50. Basalt, Mazagon, Bombay. Laumonite with large crystals of Calcspar, and globules of Prehnite scattered through the Laumonite. By J. E. Malcolmson, Esq.
,, 51. Ditto. Laumonite penetrating Calcspar and terminating in it, with the usual crystalline form, by ditto.
,, 52 to 53. Nummulite limestone. Cutch.
,, 54. Indurated clay containing Paludina Deccanensis, Physa Prinsepii. Geol. Trans. vol. v, pl. 47. Altered into a basaltic looking rock. *Saugor.*
,, 55. Indurated clay (fresh water.) Gharri, foot of Nalchah Ghaut, (Vindiah hills,) between Mandoo and Mhow.
,, 56. Indurated clay from Gharri, near Mandoo, with Melania Quadri-lineata.
,, 57. Indurated clay with tertiary Lacustrine fossils. Gharri, foot of Nalchah Ghaut, northern escarpment of Vindiah mountains, between Mandoo and Mhow.
,, 58. Cast of Physa Prinsepii, &c. Gharri, near Mandoo.
,, 59. Physa Prinsepii, compressed. Gharri, near Mandoo, see Dr. Voysey on Gawilghur, As. Res. vol. xviii, p. 187.
,, 60. Melania, quadri-lineata. Geol. Trans. vol. v, pl. 47. Gharri.
,, 61. Cast of Melania, quadri-lineata. Ditto.
,, 62. Cast of Paludina Deccanensis. Gharri.
,, 63. Cypris Subglobosa. Gharri. Geol. Trans. vol. v, pl. 47, fig. 3.
,, 64. Paludina Deccanensis, Chara Malcolmsonii, Cypris Cylindrica, and Subglobosa. Munnoor Deccan, Geol. Trans. vol. v, pl. 47.
,, 65. Variety of Calcedony from the Vindiah hills.
,, 66. From the Bund of Arrore, Scinde.
,, 67. Flint, pounded and burned, and worked for the formation of painted tiles, &c. at Hydrabad, Scinde. Sir Alexander Burnes.

No. 68. Flint for Pottery, west of the Indus opposite Hydrabad, Scinde. Sir Alexander Burnes.

,, 69. Believed to be the pounded flint, No. 68, used in pottery. From Sir Alexander Burnes' collection, but the label lost.

,, 70. Natron, Scinde. Sir Alexander Burnes.

,, 71. Sand of the Indus, label lost. Sir A. Burnes' collection.

,, 72. Lanmonite, Mazagon, Bombay.

John G. Malcolmson,

Bombay, 9th February, 1844. *Secretary, B. B. R. A. S.*

Presentation of a Silver Standish to H. Torrens, Esq.

When the Geological Curator had concluded his portion of the business of the evening, the President, The Hon'ble W. W. Bird, rose and addressed the Meeting as follows. Before we proceed farther, I wish to draw your attention, gentlemen, to the beautiful specimen of Indian workmanship lying on the table in the shape of a silver inkstand, which is intended as a testimonial to Mr. Torrens, from his associates of the Asiatic Society, expressive of the deep sense entertained by them of his distinguished services. It will be in the recollection of many here present that about the commencement of last year, he was obliged, for reasons then stated, to resign the office of Secretary which he had for some time held with so much credit to himself, and so much advantage to the Society, and it was on that occasion that this testimonial was voted to him, which, under the superintendence of Mr. Piddington, has assumed the form of the very tasteful object now before us, and on which no pains or expense have been spared to render it worthy of Mr. Torrens' acceptance.

As few can have the opportunity of examining this elegant specimen of Indian manufacture, I will shortly describe it, and I cannot do so more appropriately than in the words of Mr. Piddington, who has kindly favored me with a memorandum on the subject.

"The style," he says, "of the testimonial is Moorish, (Arabesque,) chosen as the most appropriate one in reference to Mr. Torrens' able and spirited translation of the Arabian Nights, (the Alif Leila,) dedicated by him to the Asiatic Society; the only translation of that classic work which has exactly painted to the English reader in his own language, and with the colours of his own imagination, the minds and the life of the children of the East.

"It is placed on a basement of shawl-work of which the pattern is the Shamrock, in allusion to Mr. Torrens' Irish origin. The frosted wreath above this basement is composed of the rose (Persia,) the Lotos (India,) and the Jessamine (Arabia.) These flowers are from nature. All the other decorations are from the Alhambra, or from the great Mosque at Cordova, two of the wonderful and inimitable monuments of a people, who seem to have been almost led to construct them as lessons to the human race of the imperishable glories of science, literature and the arts, as compared with those of conquest.

"The centre and surmounting ornament is an exact model of the Fountain of Lions in the Alhambra. It has been chosen, not only from its beauty, and its numerous historical associations with the magnificent era of the Arabian Khalifs of Spain, but also from

its being in itself a curious and a solitary instance of the practice of an art forbidden in the Koran, by Mahomedan artists. It is one of those unique and precious monuments which the arts have given to History and to Poetry, at the sight of which a thousand associations with the annals of a whole nation, (the European Arabians,) now extinct, are awakened in the mind. I need not remark here, that every page of these annals from the landing of El Tarikh to the glories of the Ommiyades, the winding sheet of Abderahman, the conquest of Granada, and the dismal farewell of the heart-broken Moors to their terrestrial paradise the Vega of Granada, is pre-eminently the classic romance of History: of which the Fountain of the Lions is still the talisman.

"It was the beautiful custom of the Arabs of old to adorn their public and private buildings, and even their weapons and domestic furniture, with inscriptions allusive to their purposes, or suggestive, or laudatory, of great, and good, and useful works and thoughts, whether religious or secular. We have in our tribute adopted this custom also, and while we have appropriated one tablet to commemorate our gift, we have, in the Arabic inscription on the opposite compartment,

لاماء يا صاحبي ازكى من الصدق
ولاكقلب سليم منبع الحق

of which the paraphrase may be rendered—

"There is no fountain like the mind,
"There is no water clearer than Truth,

conveyed an aphorism of which no one better than Mr. Torrens can appreciate the hidden meaning."

Such is the testimonial, and in presenting it to Mr. Torrens on the part of the Society, I beg to assure him, that it affords me the most sincere gratification to be their representative on the occasion, and the channel of communicating to him a token of estimation so well deserved. I beg also to assure him on their part, and likewise on my own, of the satisfaction we feel at his having been so obliging as to resume the situation in which the services, now so inadequately acknowledged, were rendered by him, and their conviction, that the Society of which he is so distinguished a member, will be indebted to him for still further services, and that he will earn for himself, by the exertion of his eminent talents, still further testimonials of their esteem and approbation.

Mr. Torrens then rose, and replied in nearly the following words:—

Honorable Sir, and Gentlemen, my Fellow-members of this Society,—I will not in ordinary phrase attempt to speak of embarrassment in now rising to address you. My gratification is too heartfelt and sincere to admit of any such sensation, and under its influence I will endeavour to express on the spur of the moment my thanks to you for this splendid, and to me, inestimable testimonial. If I do not do so in set terms, you

must pardon me, for I have felt myself unable to write a set-speech in anticipation of this high honor now conferred, and I have therefore judged it best to trust to the spontaneous utterance of the heart, if I may so say, which sometimes by its truth gives weight and dignity to even the sorry phrases of a speaker but little practised.

Gentlemen, the first and most anxious desire of every man, who has in any sort addicted himself to literary pursuits, is the thirst for literary distinction. This I have felt in common with thousands a thousand times better qualified to earn, and to deserve it, than I ever have been, or could ever be, but my position offered to me little expectation of being at any time able to achieve it. The days are passed when men engaged in this country as public servants, could without any dereliction of duty enjoy the luxuries of lettered ease, and follow steadily up their literary labours, or their plans of historical or scientific research, *pari passu* with the performance of their official functions. The calls of office have greatly multiplied as was natural they should do, with the extension and consolidation of the British power in this country, and the enjoyment of that leisure which enabled a Jones, a Colebrooke, or a Wilford to enrich our sum of knowledge by the valuable results of their researches, can be no longer hoped for by those who have succeeded them. It may be said there were giants in those days, and doubtless few have since appeared who could rival or compete with the galaxy of able, and learned orientalists, whose labours in the early days of this Society rendered its name illustrious in the scientific world of Europe,—who led to the foundation of the Asiatic Societies of London and of Paris,—nay, more, who brought about that taste for the study of Sanscrit literature, which in Germany particularly has led to discoveries in philology, and in the history of nations as traceable thereby, not less invaluable than unexpected.

In addition to the disadvantage above alluded to, I had in taking the office of your Secretary, the discouraging example of what in this enervating climate over-exertion in literary, combined with official labours, will effect, in the person of my esteemed and lamented friend and predecessor, James Prinsep. Where such a mind was unequal to support the strain, I felt how idle and absurd it would be in any one less qualified for the struggle by varied ability, and copious information, to attempt to venture on it. I therefore determined, instead of endeavouring at something new, to work out to the best advantage, the unemployed and unillustrated treasures of our various collections, and, conscious of my incapacity save in superficial attainments on a limited field, I decided on attempting to obtain the services, and superintend the labours of men really competent in distinct branches of science. Our then President, Sir Edward Ryan, warmly supported my views, the local Government, to its honor be it spoken, came forward with liberal and timely aid, while the Honorable the Court of Directors consented to uphold us in that spirit of munificence which it has often evinced in matters of science. Thus, Gentlemen, I found shortly afterwards associated with me, our curators, Messrs. Piddington and Blyth, and while I laboured to convert the Journal, (then my property,) into a Journal of General Science in accordance with the plan laid down by Sir William Jones on instituting this Society, instead of attempting chiefly to work out in it the doubtful problems of antiquarian research,—while I was occupied in procuring material for our Transactions,—in arranging and digesting our records, and in providing for the printing and publication of Oriental works (and I more

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particularly allude to the reprint of the three first volumes of the *Fatwa-i-Alumgeeri*) —these gentlemen busied themselves on the one hand in re-arranging our geological and mineralogical collections, then to all appearance in hopeless confusion, and in classifying them by catalogues recovered from the disordered mass of our papers,— and on the other in re-stocking—I may say, in creating—our Museum of Zoology. If our relations with other scientific bodies have been renewed, and enlarged,—if the name and character of our Society has been worthily maintained—if we are now possessed of a Museum which taken in conjunction with our Library, and our antiquarian treasures, places this Society first as a scientific body in the dependencies of the British Crown,—I take no credit to myself apart from these, my zealous and worthy fellow-labourers.

Happily placed in conjunction with them, it has been my fortune to have by your kindness accorded to me as your Secretary, that literary distinction, so earnestly, and ambitiously desired, but which I could have hoped to obtain in no other but such circumstances. There are times, Sir, when such distinction, proud as it is, becomes doubly welcome, and I am in the position to feel its value at this moment most sensibly.

Let me, Mr. President, express to you briefly my personal feeling of gratitude for much good will shewn towards me, and for the constant support which you have afforded me in my endeavours to carry out arrangements, of which you were pleased to approve, for the benefit of the Society. Let me here express to the Asiatic Society of Bengal, my heartfelt acknowledgments for this magnificent token of their good opinion, and to assure them, that its receipt highly enhances the steady inclination I have ever had to devote in so far as occasion permits, my poor services to the promotion of their interests.

Gentlemen, I most heartily and sincerely thank you.

In pursuance of the desire expressed by Members, the following Memorandum was circulated by the Sub-Secretary, and under the order upon it the annexed plate of the Standish is given.—H. P.

Memorandum by the Sub-Secretary.

The Honorable the President and Committee of Papers, Asiatic Society.

After the conclusion of the meeting of Wednesday evening, several Members expressed a wish, that a lithograph of the Standish presented to Mr. Torrens, should appear in the Journal.

The Sub-Secretary solicits the orders of H. H. and the Committee.

He may remark, that such objects are strictly within those of the Society, which in the words of its illustrious founder, embraces in its enquiries, "whatever is performed

by man or produced by nature," and it may not be, moreover, uninteresting to place upon record, any step in the fine arts made under the patronage of the Society.

Many Mofussil Members also have subscribed to the Testimonial, and will no doubt be happy to see their money satisfactorily laid out.

H. PIDDINGTON,

Museum, 4th April, 1844. *Sub-Secretary, Asiatic Society.*

For all the foregoing communications and presentations, the best thanks of the Society were voted.

(*Wednesday Evening, the 1st May*, 1844.)

The stated Monthly Meeting was held on Wednesday evening, the 1st instant, at half-past eight P. M. The Honorable the President in the chair.

The following list of books presented and purchased was read.

Books received for the Meeting of the Asiatic Society, on the 1st of May, 1844.

Report on Public Instruction in the Bengal Presidency, 1842-43.—Presented by Dr. Mouat.

The Oriental Christian Spectator, April 1844, vol. v, second series, No. 4.—By the Editor, Bombay.

Meteorological Register kept at the Surveyor General's Office, Calcutta, for the month of March.

Nalodaya.—By the Rev. J. Yates.

Papillons Exotiques, par F. P. Cramer, Amsterdam, 1779-1791, 5 vols. 4to.—Presented by Capt. W. Wroughton.

Natural History of Uncommon Birds, by G. Edwards, London, 1743-1754, 7 vols. 4to.—Presented by Capt. Wroughton.

Read the following letters from Messrs. W. and H. Allen and Co., the Society's London Agents.

Henry Torrens, Esq. *&c. &c. &c. V. P. Asiatic Society of Calcutta.*

Sir,—We have the honor to acknowledge the receipt of your favors, dated 5th September and 13th December 1843, and also the copy of a letter addressed by you to Mr. John Murray. As we learn from you that the Journal from No. 133 is now vested in the Society, we think it advisable to annex you our account, embracing No. 132, which is £9: 19: 2 in favor of the Society. We have received from Mr. Murray £21 : 9, which is placed to the credit of the Society. The stock of Books in the hands of Mr. Murray will be forwarded to you in a day or two.

The quantity of Books in the Warehouse of Mr. Murray, belonging to the Society, is very heavy, and you must be aware that we can never dispose of them here. Of some volumes, Mr. Murray will hand us more than 200 copies. We would recommend something being done with them, and we think they might be returned and disposed of in India with more advantage than they would be here, where they could only be sold as waste paper. Every year they are kept, they will be of less value to the Society. If they were advertised, we fear the sales would not pay the expences of so doing. If you will favor us with the wishes of the Society, at an early date, we shall be much obliged to you.

We are, Sir,

London, Feb. 29, 1844. Your faithful Servants,

Wm. H. Allen and Co.

HENRY TORRENS, ESQ. *for Journal of the Asiatic Society of Bengal, in Account with* W. H. ALLEN AND CO. ..... *Cr.*

	On hand June 30, 1843.	Received since.	On hand Feb. 28, 1844.	Sold.	Per Copy.	£	s.	d.
Journal, ...No. 97	8	..	8	..	2/9	..	..	..
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—— 130	..	50	17	21	..	2	17	9
—— 131	..	50	18	20	..	2	15	0
—— 132	..	50	18	20	..	2	15	0
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London, February 28, 1844. E. E.
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* DISTRIBUTED.

1 Copy each No. 129 to 132 to Professor Wilson.
1 —— Do. —— Ed. Asiatic Journal.
1 —— Do. —— Royal Society
1 —— Do. —— Royal Asiatic Society.
1 —— Do. —— Ed. Phil. Journal.
1 —— Do. —— Royal Institution.
1 —— Do. —— Philosophical Magazine.
1 —— Do. —— Athenæum.
1 —— Do. —— Baron Von Hammer Purgstall.
1 —— Do. —— Royal Society of Edinburgh.
1 —— Do. —— Spectator.
1 —— Do. —— Professor Schlegel.

H. Torrens, Esq.

Dear Sir,—You may remember about two years ago, the Asiatic Society ordered Arrowsmith's Map of India from us, which was shipped to the Society in January 1842. The order from the Society for it is worded thus: "As soon as possible send to my address, as Secretary to the Asiatic Society, a copy of the latest Map of India, by Arrowsmith, of the largest size, on spring rollers, &c. for the use of the Society."

The order was strictly complied with in the selection of Arrowsmith's largest and latest Map; on its arrival the Society write,

"The letter advising the dispatch of Arrowsmith's Map has come to hand, but I beg to observe, that although my letter of the 15th May 1841, commissioned the *latest published* Map by Arrowsmith, yet you are aware that since the Map was compiled by him, *Arrowsmith*, more countries have been acquired and more full and complete Maps of India have been published under the auspices of the East India Company; and if the Society is not much mistaken, these publications have been undertaken by yourselves. Under these circumstances the Society expected, that notwithstanding Arrowsmith's Map was *specially* ordered, you would have exercised your judgment to send the latest and most complete Map of India instead of the one sent by you. The Map from its incompleteness is quite useless to the Society, and as such, it is, I regret to say, rejected, and made over to Messrs. Thacker and Co., to whom you will please give instructions for its disposal."

The Society again write on the 5th September, 1843:—

"Although the Society is not disposed at present to disturb the account current closed to the 30th June 1843, yet I am desired to say, that it is susceptible of adjustment with reference to my letter of February, as regards the cost and charges of Arrowsmith's Map; viz. £18 10*s*, which has been rejected by the Society as incomplete. You have already been advised that the Map has already been made over to Messrs. Thacker and Co. for disposal on your account."

On perusal of the foregoing it will be clear to you, that we had no alternative, but to forward the Society Arrowsmith's Map of India, which is *double the size* of ours. It would have been much more to our advantage to have disposed of our own publication instead of purchasing Arrowsmith's; but it would not have been either honest to the Society or to Arrowsmith, had we done so. We concluded that Arrowsmith's Map was well known to the Society, and for aught we knew, the Society might have already possessed our Map, which is always procurable in Calcutta. Under these circumstances it is quite clear, that it is no fault of ours that the Map ordered to the Society has proved of little use. We conclude the Map to be still in the hands of Messrs. Thacker and Co. For the last year we have had no connection with them, and it is not our

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intention to renew it. We trouble you with this letter *privately*, and shall be obliged by your explaining the matter to the Society. It would not be reasonable to suppose we can bear the loss of £18 10*s*, when *no error* had been committed by us. The agency of the Society is, as you must be aware, at times very troublesome, and for which we never make any charge, but on the contrary often study to promote its interest at our own expense. This we shall continue to do, and consider the interests of the Society as identical with our own. Our Map of India has just been corrected, at a great outlay, to the present date, and if the Society desire to possess it, it will cost about £10 10*s*. including shipping expenses to Calcutta.

We are, dear Sir,

London, February 29, 1844. Your faithful Servants,

W. H. ALLEN AND Co.

Read the following letter from Government, accompanying the work to which it refers :—

No. 550 of 1844.

From W. EDWARDS, ESQ. *Under-Secretary to the Government of India, to* H. TORRENS, ESQ. *Vice President and Secretary to the Asiatic Society.*

Foreign Department.

SIR,—I am directed by the Governor General in Council to transmit to you, for such notice as the Society may deem it deserving of, the accompanying Grammar of the Cashmeree Language, by Major R. Leech, C. B.

I have the honor to be, Sir,

Your most obedient Servant,

Fort William, the 6th April, 1844. W. EDWARDS,

Under-Secretary to the Government of India.

This Grammar was referred to the Editors of the Journal for publication.

Read the following letter from Dr. Griffith, Acting Superintendent H. C. Botanic Garden :—

MY DEAR SIR,—Dr. Martius, the learned writer on Brazil, and a high scientific character, is anxious, as Secretary to the Mathematico-Physical part of the Ratisbon Academy, to ascertain whether the Asiatic Society would be willing to enter on a system of interchange of publications and objects with that Academy, and if so, what are the publications, &c. the Society would wish to have, and of what it would be convenient to the Society to dispose.

*

I shall feel obliged if you can give me such information as will be sufficient to guide Dr. Martius, and hope that it will be such as will enable him to complete what he earnestly desires, a constant and liberal exchange with the Head Society of India.

I am, My dear Sir,

Your's truly,

Botanic Gardens, April 20, 1844. W. Griffith,

Member, Royal Ratisbon Academy.

Ordered, that a letter expressing the best thanks of the Society for the friendly overture of Dr. Martius, and the Society's desire to promote on its side the most friendly relations with the University of Ratisbon be sent.

Read the following letter from Captain Williams, 1st Assistant Commissioner of Arracan :—

Dear Sir,—I have the pleasure to inform you, that I have forwarded to Kymkhroo for the purpose of being conveyed on the "*Amherst*" to you, an iron anchor stock, found on Chedooba, at the spot where the gold coin and javelin heads were discovered. I can obtain no information whatever from the Mugs about it, but it may throw some light towards the discovery of the country and age of the coins.

Your's very truly,

Ramree, Arracan, March 27, 1844. D. Williams.

The Sub-Secretary submitted to the Meeting an impression taken from the iron bell from Ningpo, presented by Captain Warden, H. C. Steamer *Queen*, to the R. R. the Bishop for the Cathedral. It was proposed and approved of, that this should be first sent to China, for translation by Mr. M. Callery or Gutzlaff, in order to learn before proceeding farther, whether the inscription contained any thing of importance and worth the trouble of taking off.

Read the following letter from Dr. Roer, accompanying the valuable translation to which it refers, which was referred for publication to the Editors of the Journal.

My dear Torrens,—I send you the first four chapters of my Translation of Bhascara Acharya's work on Astronomy; this is about the fourth part of the whole, and sufficient, I think for one number of the Journal.

Your's sincerely,

20th April, 1844. G. Roer.

Read letter from the Rev. W. Yates, addressed to the Honorable the President, with a copy of the "Nalodya," the able and very useful work to which it refers.

The Honorable W. W. Bird, Esq. *President of the Asiatic Society.*

Dear Sir,—If it is not giving you too much trouble, will you allow me to beg of you the favour of presenting to the Asiatic Society at their next Meeting the accompanying work. It is so much in keeping with the designs of Sir W. Jones, the noble founder of the Institution, that I venture to entertain the hope, that it will not be unacceptable.

I am, your's very truly,
W. Yates.

April 12, 1844.

Read the following letter from J. Muir, Esq. C. S. :—

H. W. Torrens, Esq. *Secretary to the Asiatic Society of Bengal.*

My dear Sir,—I am sorry to find that the untoward circumstances mentioned in your letter, (received some time ago in Calcutta,) have for the present put a stop to the measures in progress for the publication of the *Sárira Vidyá.* Could you kindly give me an idea what it would cost to print and edit the MS. in the manner formerly proposed, either with or without the plates, which were to be had out from England. In the mean time, I should like if possible to have a MS. copy of the work, if that can be allowed me, in the Nagree character, and if you would be good enough to order it to be put in hand, I will remit the cost of copying.

I remain, My dear Sir,
Your's faithfully,
Agra, April 9, 1844. J. Muir,
Member of the Asiatic Society of Bengal.

Ordered, that a statement be drawn out and submitted in the first instance to the Committee of Papers.

Report of the Curator Museum of Economic Geology, and Geological and Mineralogical Departments, for the month of April, 1844.

Geological and Mineralogical.

From Major Crommelin, B. E. through Messrs. Colvin and Co. we have to acknowledge a very handsome donation of upwards of 200 specimens of Rocks and Minerals, Scottish, English, (Cumberland and Westmorland,) and Foreign, with about a dozen specimens of organic remains, amongst which last I may note as a valuable addition to our cabinets, portions of the jaw with teeth, of an Icthyosaurus, and a beautiful slab with remains of the Briarean Pentacrinite. Of the rocks and minerals, many are very great additions to our cabinets, and all would have been far more so had any numbers or labels remained to the rocks by which we could have referred them to the localities from which so many derive

their value. The minerals are of course easily recognised and re-numbered, but to identify the rocks, of which there is but a mere dealer's catalogue, is necessarily a work of much longer time, as many books and descriptions must be referred to, and in the end, a few will be always uncertain. Nevertheless, the Society is under very great obligation to Major Crommelin for his liberal donation, and I trust that gentlemen who may, like him, have old dealer's collections, or even remnants of collections, will not be deterred, by their imperfect state and want of numbers or catalogues, from sending them. We shall always be able to turn them to some account.

I have to record to-day also, another instance of the attention of the Government of India, and the Honorable Court of Directors, to our wishes as to a Map of the country comprised in Dr. Voysey's report, published in vol. II. of the Journal, where at p. 304, the sections but not the Map are given. The following is the letter from Government accompanying this Map:—

No. 90.

From T. R. Davidson, Esq., *Officiating Secretary to the Government of India, to* H. Torrens, Esq., *Secretary to the Asiatic Society.*

Home Department.

Sir,—With reference to your letter dated the 27th of August 1842, I am directed by the Honorable the President in Council to transmit to you the accompanying Copy, Para. 30 of a Despatch from the Honorable Court of Directors No. 17 of 1843, dated the 1st November, together with Dr. Voysey's Geological Map of the Country between the Godavery and the Kistna therein alluded to, for the use of the Museum of Economic Geology.

I am, Sir,

Your obedient servant,

Council Chamber, the 27th January, 1844.

T. R. Davidson,
Offg. Secy. to the Govt. of India.

Extract from a Despatch from the Honorable the Court of Directors in the Public Department, dated the 1st November 1843, *No.* 17.
Answer to Secretary's Letter, dated 12th October, No. 20 *of* 1842.

Requesting to be furnished with a copy of Dr. Voysey's Geological Map for the Museum of Economic Geology.

30. There is only one Geological Map connected with Dr. Voysey's report, which includes part of the country between the Godavery and the Kistna. A copy of this Map is forwarded as a number in the packet.

(True Extract,)

T. R. Davidson,
Offg. Secy. to the Govt. of India.

This would have been brought forward at the same time as Major Herbert's Map, but it came in late, and I detained it from that report to refer to the Journal, and (for which I have to apologise) forgot it at the next Meeting.

I have the pleasure to exhibit a very well drawn and accurate copy of Captain Herbert's Map from the press of Messrs. D'Rozario and Co., which is now in progress of colouring, and will be distributed with a number of the Journal; a large margin being left to take it out and put in again to the volume to which it belongs. I have farther

preserved some blank copies of this valuable little Map for the use of the Geological Department of the Museum, and I hope by distributing some to our zealous friends to obtain from them some notes and fillings up, to aid our knowledge of that interesting part of India.

Museum of Economic Geology.

From Mr. J.N. Martin, Executive Officer, Lower Assam, we have received through Colonel Garstin, Superintending Engineer, Lower Provinces, two chests containing specimens of ancient earthen tiles, of rocks and soils, and of wood from that country.

Mr. Martin's Letter is as follows:—

No. 320.

From Mr. J. N. MARTIN, *Executive Officer, Lower Assam, to Colonel* E. GARSTIN, *Superintending Engineer, Lower Provinces.*

SIR,—With reference to your Circular No. 12 of the 4th August 1842, forwarding a printed letter and statement from the Curator Museum of Economic Geology, I have the honor to annex a list of specimens collected by me in this division, which I shall be obliged by your allowing me to put on board one of your boats for transmission to the presidency.

2. Specimen No. 1 was dug out of some old ruins which were being levelled at Gowhatti, in which No. 4, 5 and 6 were also found, and probably formed some part of a Temple. These fragments will suffice to shew the state of the arts in Assam in former days. I regret that these specimens are not more perfect; they are the only ones of the kind I have met with.

3. Specimens No. 7, 8, and 9 are from stones lying about Gowhatti, and which seem to have formed extensive buildings, (Temples,) which have long since disappeared, the remains of which are scattered over the station, and are constantly being dug up. Some of the stones are fine specimens of workmanship. The rock from which the stone seems to have been quarried is found at the base of the Hills about Gowhatti, laid bare by the Burrampootur and in rocks in the river.

4. Specimens No. 10 and 11 are from the ruins of an old brick Temple at Tezpoor. 12 and 13 are specimens of granite from the same place from stones wrought and unwrought, an immense number of which have been collected for the purpose of some extensive buildings, (probably Temples,) which from the appearance of the stones seem never to have been used in any building. The stones appear to have been quarried from rocks in the Burrampootur, and from the base of the Hills in the vicinity.

5. Specimen No. 16 is soil from Rannee Godown, said to be adapted for the cultivation of tea, and extends over a large tract of country. On my late visit to Gola Ghaut, 175 miles above Gowhatti and 200 above Rannee Godown, I was struck with the similarity of the soil on which an individual has commenced the cultivation of the tea plant. No. 17 is a specimen.

6. Specimen No. 18 is a brick dug out of the ruins of an old Temple, probably Mahomedan, at Gowalparah, and bears a Persian inscription. From its appearance it seems to have formed a step or floor, and is evidently of recent date compared with the ruins found in Assam.

7. Specimens No. 2, 3, 14 and 15 shew the superior quality of the bricks in former days, which are far superior to any thing we can make at the present time. The art of brick-making has long been lost to the Assamese, and it is only within a few years that it has been revived. The people in the mechanical arts have sadly degenerated, and they have very little or no inclination to follow the example of their forefathers in these pursuits.

I have the honor to be, Sir,

Your most obedient servant,

J. N. Martin,

Executive Officer, Lower Assam.

List of Specimens for the Museum of Economic Geology.

No. 1.—Piece of a large Brick.
—— 2. } Common Assamese Bricks.
—— 3. }
—— 4. } Fragments of Tiles.
—— 5. }
—— 6. Ditto of glazed Tile.
—— 7. }
—— 8. } Specimens of Granite.
—— 9. }
} From Gowhatti.

—— 10. } Bricks from the ruins of an old Temple.
—— 11. }
—— 12. } Specimens of Granite, from Tezpore.
—— 13. }
—— 14. } Bricks from Bishnath.
—— 15. }
—— 16. Tea soil from Rannee Godown.
—— 17. Ditto ditto Gola Ghaut.
—— 18. Brick from Gowalparah, with Persian inscription.

J. N. Martin,

Executive Officer, Lower Assam.

No. 3,585.

To H. Piddington, Esq. *Curator, Museum Economic Geology.*

Sir,—I have the honor to forward the enclosed Original Communications as noted on the Margin, from Mr. J. N. Martin, Executive Officer, Lower Assam, which ought to have accompanied the specimens lately sent by him through me.

No. 320, dated 31st Jan. 1844.
No. 333, dated 12th Feb. 1844.

I am Sir,

Your obedient servant,

Fort William, 10th April, 1844.

E. Garstin, Lieut. Col.

Superintending Engineer, Lower Provinces.

List of Specimens of Wood from Assam for the Museum Economic Geology.

1.—Gheara.
2.—Larang.
3.—Willow Bha.
4.—Chumpa.
5.—Seeharoo.
6.—Naghusar.
7.—Saul.
8.—Chamn.

J. N. Martin,

Executive Officer, Lower Assam.

No. 333.

From J. N. MARTIN, ESQ. *Executive Officer, Lower Assam, to* COL. GARSTIN, *Superintending Engineer, Lower Provinces.*

SIR,—In continuation of my letter No. 320 of the 31st January last, I have the honor to annex a list of eight specimens of timber for the Museum of Economic Geology.

2. It was only within the last two or three days that I was informed by Major Jenkins, that such would be acceptable; I shall continue to make a further collection as opportunities offer.

I have the honor to be, Sir,
Your most obedient servant,
J. N. MARTIN,
Executive Officer, Lower Assam.

Gowahatti, 12th February, 1844.

For all the foregoing communications and presentations, the best thanks of the Society were voted.

Proceedings of the Asiatic Society for the month of JUNE, 1844.

Wednesday Evening, the 5th JUNE, 1844.

The Monthly Meeting of the Society was held at the usual hour on Wednesday evening, the 5th June, H. Torrens, Esq. Vice President in the chair.

The following list of books presented and purchased, was read :—

Books for the Meeting of the Asiatic Society, June 5, 1844.

1. Meteorological Register for the month of April 1844, from the Surveyor General's Office.

2. The Oriental Christian Spectator for May 1844, No. 5, 2nd series.—Presented by the Editors.

3. Journal of the Agricultural and Horticultural Society of India, Vol. II, No. XI, 1844.—Presented by the Society.

4. Annals and Magazine of Natural History, Vol. XII, No. 76 for 1843.—Purchased.

5. Proceedings of the Academy of Natural Sciences of Philadelphia, Nos. 30, 31, 32 and 33.—Presented by the Society.

6. The Athenæum, for March 16th and 23rd, 1843.— In exchange for the Society's Journal.

7. Report of the Secretary of the Navy U. S.—Presented by M. R. Johnstone.

8. Magnetic Observations from the Observatory of Bombay.—Presented by Government.

9. Goodwyn's Memoir on Wrought Iron Roofing, with a Vol. of Plates.—Presented by the Author.

10. Brief Grammatical Notice of the Siamese Language, with an Appendix, by T. Taylor Jones.—Presented by the Author.

11. Notes on the Marine Glue, by Alfred Jeffries.—Presented by Mr. J. De Garnier.

12. L. Asie Centrale ; Recherches sur les chaines de Montagnes et sur la Climatologie, Vols. 1, 2, and 3, par A. de Humboldt.—Presented by the Author.

13. Pearl Fisheries of Ceylon, by J. Stewart.—Presented by C. B. Greenlaw, Esq. in the name of the Author.

14. Napier's Peninsular War, Vols. 3, 4, 5, and 6.—Purchased.

15. Letters à G. de Tassy, on Sugat, &c. de sa Notice Institute Saadi, par M. Newbold.—Presented by the Author.

16. Saadi, Auteur des Premieres Poesies Hindoosthani, par G. de Tasssy, 1843.—Presented by the Author.

The Vice-President and Secretary stated with reference to Napier's Peninsular War, that as the Library contained many incomplete works, he would suggest that he be authorized, as occasions might present themselves, to complete such works. This was unanimously agreed to. He also noticed in terms of approbation, the valuable work of Mr. Stewart, on the Pearl Fisheries of Ceylon, a work undertaken, as he had been informed, from motives of public utility alone, and most creditable both in its design and execution.

Read the following letter from the Under-Secretary to the Government of India:—

No. 1093 of 1844.

From W. EDWARDS, *Esq. Under-Secretary to the Government of India, to the Secretary to the Asiatic Society.*

Foreign Department.

SIR,—By direction of the Governor General in Council, I have the honor to transmit to you, for such notice as the Society may deem it to merit, the accompanying report, by Captain Jacob, on the general condition of the Province of Kattywar, and on various points of information, chiefly of a geographical and statistical nature connected with that province.

2. It is requested you will return the document when no longer required.

I have the honor to be, Sir,
Your obedient Servant,
W. EDWARDS,
Under-Secretary to the Government of India.

Fort William, the 25th May, 1844.

Read letter from the Under-Secretary to the Government of Bengal, according free freight on the Government Steamers, for two boxes of books for the Education Committee, N. W. P.

Read the following letter from the Curator, Zoological Department:—

To the Secretary of the Asiatic Society.

SIR,—I beg to lay before the Society a request of Mr. J. E. Gray, of the British Museum, contained in a private letter to myself, that I would procure for him certain specimens procurable in this vicinity, for which he offers to pay a sum not exceeding £30 annually, to cover the expences of procuring and preparing of them, while the

cost of transmitting such to London will be defrayed by the British Museum. Should the Society approve of my undertaking the superintendence of such collections, the specimens might either be prepared by the Society's taxidermists, during the hours of their non-attendance at the Museum, or an additional taxidermist might be employed for the purpose, upon a salary deducted from the sum suggested by Mr. Gray.

I have also to request, on the part of Mr. Jerdon, that he may be allowed to publish figures of certain of the Society's birds in the course of his work, now in progress, upon Indian Ornithology; leaving it to me to make a selection for the purpose. I beg to recommend that Mr. Jerdon's offer to do so, be entertained by the Society, as our collection contains a very considerable number of species which it is most desirable should be figured, and could well spare as many as Mr. Jerdon could possibly require.

I wish to call the attention of the Society to the desire of certain Anglo-Indian youths, to be apprenticed to the Society for three or more years, in order to be taught the art of taxidermy. The difficulty which I have hitherto experienced in procuring such youths to assist in the Museum is considerable, and their usefulness is shewn by the large collection of skins now upon the table, most of those sent by Captain Phayre, having been prepared by a lad instructed at the Museum, with whom I furnished him, and who was employed by the Society in Arracan upon a salary of 5 Rupees a month, upon which terms two other lads are at present engaged, one on board the *Tenasserim* merchant-vessel, which at this time is on the coast of New Guinea, where I expect that many specimens will be collected, and the other is with Capt. Abbott at Ramree. The terms of apprenticeship required, on the part of the lads, who have now applied to me, are 3 Rupees a month for pocket-money, and a suit of clothes annually, which I understand is an usual mode of making such contracts in this country. Should the Society approve of such an arrangement being made with one or more of these youths, I should be glad of their assistance at the Museum immediately, where there is a variety of work upon which they might be at once employed.

I am, Sir,
Yours obediently,
June 5, 1844. ED. BLYTH.

After some conversation it was settled, that the Curator of the Zoological Department, British Museum, be invited to address the Asiatic Society of Bengal officially, and that Mr. Blyth be also requested to address the Secretary, and to communicate with the Sub-Secretary fully in detail on the subject of the proposed apprentices. Mr. Jerdon's request was acceded to, but with the special proviso, that he should also be invited to address the Society officially, and that while all birds sent to him should be duly reported and recorded in the Society's Proceedings, he should also undertake on his part duly to acknowledge them in his forthcoming work as *from* the Society's Museum.

Read the following letter from M. Jules Mohl, Assistant Secretary to the Societé Asiatique de Paris, addressed to the Sub-Secretary:—

Society Asiatique.

SIR,—I beg to acknowledge the receipt of your letter of the 14th of September 1843, by the *Gabrielle*, containing a ship-letter of a box of Manuscripts of the Vedas. I have sent the ship-letter to Marseilles, and expect every day to receive the box. I am charged by the Society to offer to you and to Ramcomul Sen, the Society's best thanks for your care and kindness.

The sudden death of M. Cassin, our agent, has imposed upon me the duty of examining all the papers relating to the Society, and to your Society's depôt of books. I have made out the account, and am this moment occupied in making the list of books in the depôt. I will report on it next month; until now I have found all in a satisfactory state. Unfortunately I have not yet found the lists of books which you had sent, and which M. Cassin ought to have bought for your Society; but as I have not yet been able to look over all the papers, I am in hopes of finding them yet, and of executing your instructions.

You mention in one of your letters, that 64 copies of the Index of the Mahabharut have been sent last year, we have received a parcel containing 64 copies of an Index to the 4th Vol. but none of the three 1st volumes. Has no Index to these been published?

I have the honor to be, Sir,
Your respectfully,
JULES MOHL,
Secritaire adjoint a la Soc. As.

Paris, 7th March, 1844.

Ordered, that the Indices to Vols. 1st, 2d and 3d of the Mahabarata be dispatched to the Paris Society.

Read the following letter from Captain D. Williams, 1st Assistant to the Commissioner of Arracan:—

MY DEAR SIR,—I have the pleasure to inform you that, in searching for gold coins on the Island of Chedooba, of which I forwarded a couple to you, the natives have dug up a large bar of iron resembling the shank of an anchor. I have had it brought to my house, and shall have much pleasure in forwarding it to the Society if commanded to do so. On the spot also were found the two Javelin heads I sent to you, and mentioned in your Journal, No. CXLII, of 1843.

It may throw some further light towards the discovery of what country and age the gold coins belonged to.

Yours faithfully,
D. WILLIAMS.

Ramree, 8th March, 1844.

P. S.—Since writing the above, I had an opportunity of sending the bar of iron or shank to Kyook Phyoo, to meet the *Amherst* for conveyance to Calcutta to your address.

The iron grapnel shank, for such it evidently is, herein referred to, is now placed on the right of the northern entrance to the portico of the Museum.

It is in tolerable preservation, though none of the grapnel claws are remaining. It measures six feet in length, but the circumference cannot be ascertained, as it is covered over with shells and an arenaceo-calcareous incrustation. It may have belonged to some European or Arab Vessel a century or more ago, and have possibly been elevated with the beach on which it was found. It cannot have belonged to the people by whom the gold coins were struck, for those betoken far too rude a state of the arts to admit of such a bar of iron having been forged, or been in use on a ship at the epoch when such coins were used.

Read the following letter from Baboo Gooroprasad Roy :—

The Secretary to the Asiatic Society.

SIR,—I have to beg that you will do me the honor to submit to the Asiatic Society, the accompanying specimen pages in type and Manuscript of a Sanscrit Dictionary in the Bengallee character, to be entitled the *Sobda Rutnakar*, and which will I presume be found of the greatest utility to Native Students of that language, and of much interest to Philologists and Scholars in general. In testimony of its merits, I further beg leave to submit the opinions of it hereto annexed, both from Native Pundits and European gentlemen of high and acknowledged talent. The MSS. is completed, and can be sent to press.

Your Society, Sir, cannot but be aware that a work like this, though it has cost many years of assiduous labour, cannot be printed without a heavy outlay which I am, from straitened circumstances, unable to afford. The most careful estimates which I can make, supported by the opinion of Dr. Hæberlin, carry the expence of the work to Co's. Rs. 8,000 for 500 copies, requiring a subscription of 160 copies at 50 Rs. each, to assure the Printer against loss.

I have therefore, Sir, respectfully to solicit that the Asiatic Society of Bengal will be pleased to accord to me such measure of patronage and support and recommendation as they may deem my labours to merit, and I beg to assure it, that no attention on my part shall be wanting to render the work by care, while passing through the press, creditable to its support.

I have the honor to be, Sir,
Your obedient servant,
GURUPRASAD ROY.

This letter was accompanied by certificates from various European Orientalists and Native Pundits in favour of the work. The Sub-Secretary stated, that the work had been brought to his notice by a learned Native friend, and one of the oldest members of the Society, who was also himself author of by far the most valuable Bengalee and English Dictionary which had yet appeared, Dewan Ramcomul Sen, and that desirous that the author of the *Sobda Ratnakar* should appear before the Society, with a

statement sufficiently definite as to the business part of the matter to enable it to consider his application at once, he had referred him to Dr. Hæberlin, who had kindly examined the work, whose opinion and letter on the subject was as follows :—

H. PIDDINGTON, ESQ. *Sub-Secretary of the Asiatic Society.*

MY DEAR SIR,—I have examined the MSS. of the Sanscrit Dictionary in Bengali characters, compiled by Bábú Guruprasad Roy, which you sent for my inspection; and I am of opinion that the work, if printed, would be of great use to Bengalee (Native) Students of Sanscrit, although in a critical point of view, and for European Scholars, its value can of course not be compared with Wilson's 2d edition. This Dictionary of Guruprasad's appears, however, to have been compiled with much care, and great labour has evidently been bestowed upon it. There are many more words in it than in Wilson's, and some really of importance; the explanations, too, are pretty full, and under each principal vocable all Sanscrit Synonymes are given in alphabetical order. Hence the work seems well adapted to Native (Bengali) Students, in as much they are accustomed to the mode observed in this work.

A similar work to this is in course of publication by R. Radhukanta, but the latter will fill 6 large 4to. volumes, and even then is not accessible to the public; and contains scarcely one-half of the vocables given in Guruprasad's; the former will when completed, be more for advanced scholars, the latter is adapted to students in general.

I think therefore, I might safely recommend the work in question to the favorable consideration of the Asiatic Society, not however for their adoption, but simply to assist the author in publishing the work. Indeed I think this belongs rather to the province of Government and the Council of Education, than the Asiatic Society. The Dictionary is not so much for the learned, as for the people of Bengal; it is for the educated Natives of this country, whether acquainted with English or not.

To print this Dictionary would require a considerable outlay. As far as I can judge, the work could not be sold under rupees 50, and if 150 copies were subscribed for by Government, the Council of Education, the School Book Society, and the Asiatic Society, there is no doubt that a Printer might be found to undertake the work. I hope something will be done towards the accomplishing of this object.

Believe me yours truly,

Calcutta, 8th May, 1844. (Signed) J. HÆBERLIN.

The Vice-President then addressed the meeting, stating, that while there could be no doubt on the one hand that the work was likely to be one of very considerable utility to Bengalee Students of Sanscrit, it was on the other evidently not of that high classic order which the Society had been hitherto wont to patronize to a large extent. He therefore suggested, that the Society should subscribe for 25 copies (1,250 rupees,) and strongly recommend the work as an educational one to the attention of Government in that Department.

After some conversation, it was determined that it should be left to the Committee of Papers to settle the number of copies to be subscribed for, and to frame the recommendatory letter to Government on the part of the Society.

Read the following letter from Dr. W. Griffith, Acting Superintendent Honorable Company's Botanical Garden, which had been overlooked at the former meeting, from having slipped into the portfolios of drawings :—

No. 22.

From W. GRIFFITH, *Esq. Officiating Superintendent of the Hon'ble Company's Botanical Garden, to* H. TORRENS, *Esq., Secretary to the Asiatic Society, dated 9th April*, 1844.

SIR,—In obedience to instructions received from the Under-Secretary to the Government of Bengal, I have the pleasure of forwarding to you the Buchanan Manuscripts and Drawings, as per margin. I shall be obliged by your furnishing me with a receipt for the same. Amongst them will be found many copies substituted for originals, and also many duplicate copies It appears to me that these, especially the last, may lead to the discovery of the manner in which so many of these drawings have been copied in General Hardwicke's Illustrations of Indian Zoology, so far as I know, without any acknowledgment (except in the case of a few turtles) of the source whence they were derived, and I am sure that the Asiatic Society will consider the object of its being the custos of these drawings in a great measure fulfilled, if it is enabled to do justice to that very eminent person, the timely publication of whose labours, would have superseded to a great degree the labours of Messrs. Hodgson, Blyth and Jerdon.

Animals, ...	37
Reptiles, ...	18
Unfinished, ...	1
Birds, ...	345
Fishes, ...	137
Unfinished drawings apparently originals, ...	18
Copies of Birds made by Dr. Wallich, ...	22
Ditto of Fishes made by ditto, several to be recognised in the Illustration of Indian Zoology, ...	20
Total,...	607
Two volumes of Manuscript.	

I have the honor to be, Sir,

Your most obedient Servant,

Hon'ble Company's Botanic Garden, 9th April, 1844.

WILLIAM GRIFFITH,
Officiating Superintendent.

Dr. McGowan, of the American Missionary Hospital at Ningpo, presented an Inscription from a Tablet in a Buddhist Monastery at Ningpo, of which the characters, though supposed to be Buddhistical, were unknown to the learned in China, whether Natives or Europeans, and had been pronounced here as not being of any recognised form of the Thibetan. The Inscription was handed to the Editors of the Journal for early insertion.

Dr. McGowan also kindly offered to take charge of the impressions from the Ningpo bell, and to inform the Society if the remaining parts were worth the trouble of cleaning and taking off.

The following report was then read for the month of May Curator Museum Economic Geology.

REPORT OF THE CURATOR MUSEUM OF ECONOMIC GEOLOGY AND GEOLOGICAL AND MINERALOGICAL DEPARTMENTS, FOR THE MONTH OF MAY, 1844.

Museum of Economic Geology.

Our recommendation to Government, that the site of the Lithographic stones discovered by Captain Shortreed, as noticed in my reports of November and December last, has it would appear, been forwarded to the Honorable the Governor of the N. W. Provinces, and in reference to it, we have to place upon record, the following letter received from Captain Stewart, B. N. I, Fort Adjutant, Chunar :—

Copy, No. 462.

From J. THORNTON, *Esq. Secretary to Government, N. W. P., to Captain* STEWART, *Fort Adjutant, Chunar.*

General Department, N. W. P.

SIR,—I am desired to forward to you the accompanying copy of a letter from the Secretary Asiatic Society regarding Lithographic stones, said to have been found near Rewah.

2d. The Lieutenant Governor has been given to understand, that you have been already engaged in inquiries regarding stones of this description in the neighbourbood of the Soane, and will feel glad if you can undertake to prosecute the search which Captain Shortreed has indicated. Any moderate sum which you may consider necessary to enable you successfully to conduct the inquiry, will be immediately placed at your disposal. I have, &c. &c. &c.

(Signed) J. THORNTON,
Secretary to Government, N. W. P.

(True Copy,)
W. M. STEWART.

Agra, the 13th May, 1844.

To J. THORNTON, *Esq. Secretary to the Government N. W. P., Agra.*

SIR,—I have the honor to acknowledge the receipt of your letter No. 462 of 13th instant, forwarding for my information a copy of a letter from the Secretary of the Asiatic Society to the Secretary to Government of India, Home Department, regarding the possibility of obtaining supplies of stone fit for Lithographic purposes from the Rewah State, and communicating the wishes of the Lieut. Governor, that I should undertake to prosecute the search.

In reply, I have the honor to state, that I shall have great pleasure in meeting the wishes of the Lieut. Governor, and have no doubt from the discoveries already made, coupled with the information contained in Mr. Torrens's letter, of being able to accomplish the desired end.

I shall with his permission place myself in immediate communication with Mr Torrens, forward for his inspection specimens of stones from situations where they have already been discovered, and obtain from him such further information as may enable me to follow up the discovery already made by Capt. Shortreed.

Specimens of genuine white lias, exactly corresponding in appearance with the best German stone, have already been procured from the bed of the Soane river, at a place situated between 50 and 60 miles S. W. of Chunar. The experiments made with them failed, owing to the softness and friable nature of the stones submitted for trial, which were unable to resist the pressure applied to them. They were however quarried from the surface, and as Mr. Torrens remarks that the best German stone is usually found with beds of inferior quality both above and below, I feel assured that a little expenditure in digging deeper will lead to the discovery of the proper kind.

I shall forward a contingent bill to you for the sanction of the Lieut. Governor, for any small expences that may be incurred in making the researches, and have to request, that you will

cause directions to be forwarded to the Steam Agent at Chunar, to receive from me free of any charge for freight, any packages containing stones I may have to forward to Calcutta for experiment.

I have, &c. &c. &c.

(Signed) W. M. STEWART, *Captain,*
Fort Adjutant.

Chunar, 20th May, 1844.

(True Copy.) W. M. STEWART.

To H. TORRENS, *Esq. Secretary to the Asiatic Society, Calcutta.*

DEAR SIR,—I have the pleasure to annex a copy of a letter to my address from the Secretary to the Government N. W. P., with my reply, dated 20th instant, by which you will observe, that I have undertaken to prosecute the search for Lithographic stone in Rewah, as suggested in your letter to the Secretary to the Government of India, Home Department, dated 14th March last.

I have this day dispatched a party to the quarry in which white lias has already been discovered, with directions to cut right through the stratum from which the stone has hitherto been quarried to ascertain whether it may not be found of a closer and firmer texture underneath.

The experiments with this stone alluded to in my letter to Mr. Thornton, were made in the Lithographic press attached to the Office of the Sudder Board of Revenue N. W. P. then at Allahabad. They were quarried close to the surface, and as the experiments, although unsuccessful in obtaining a good impression, shewed that the stone was of the proper kind, I think it well worth while to search further before pronouncing it to be a failure.

I shall forward specimens of the stone to your address per Steamer as soon as I receive them, which will probably be in the course of a month. In the meantime I will be obliged by your obtaining from Captain Shortreed precise directions, whereby the locality from whence he obtained the specimens forwarded to you, may be correctly ascertained; I shall thus be able in the cold weather to follow up the discovery alluded to in your letter to Government, should the present experiment prove unsuccessful.

I have to request you will inform me under what official designation I may be able to correspond with you in the matter under discussion. "On the public service," I am not aware whether or not I can do so, as Secretary to the Asiatic Society. I remain, Dear Sir,

Your's faithfully,
W. M. STEWART.

Chunar, 24th May, 1844.

P. S.—I will thank you to forward me at your leisure a few small specimens of German stone of different kinds, to enable me to compare them with those found here.

We have replied to Captain Stewart, directing his attention also to any traces of organic remains which the formations in that locality might afford, and forwarding by dawk banghy specimens of German stone for comparison.

From Mr. Jas. Dodd, Assistant Assay Master, we have to acknowledge two very handsome specimens of the matrix of the Gold of the Real del Monte Mines, and two of Copper Ores from Cuba.

Major Alexander, B. A., has obliged us with a few specimens of copper ores and iron and pyrites, some of which will be of use as duplicates for exchanging, and one or two will find a place in our Cabinets. Capt. Goodwyn, B. E., has added to our library of reference by his valuable work on iron roofing, already noticed amongst the donations of books, but which should have its place in this report also, as being one day to become a text book for this important application of a mineral with which India so much abounds. It may not have been noticed, but it should be so, for

it is important as a step in Indian typography, that the numerous diagrams in this work are intercalated with the text as if they were wood cuts! though evidently lithographs, and of course far superior to type-metal cutting. Upon enquiry of Mr. Huttmann, of the Govt. Gazette Press, by whom the work is printed, he informs me that they *are* lithographs, and that they were so inserted by first printing off the sheet with the necessary blank spaces, and then sending the wet sheets to the lithographers who printed in their share. This arrangement is highly creditable to the contriver of it, and a most valuable hint to all who may like ourselves feel the absence of the art of wood-cutting, in illustrating papers relative to the arts or sciences.

For all the foregoing communications and presentations, the best thanks of the Society were voted.

Proceedings of the Asiatic Society for the month of JULY, 1844.

Wednesday Evening, 3rd JULY, 1844.

The stated Monthly Meeting of the Society was held at the Society's Rooms at half-past 8 P. M.

The following list of Books presented and purchased was read:—

Books received for the Meeting of the Asiatic Society, July 3, 1844.

The Penny Cyclopedia, Vols. 25, 26 for 1843, and Vol. 27 for 1844.—Purchased.

Transactions of the Society of Arts, &c.—Presented by the Society.

The Edinburgh New Philosophical Journal for October 1842 to January 1844.—Presented by the Editor.

Estado de las Islas Filipinas, Vol. 2, 1844.—Presented by the Author.

Mémoire sur l'Idéographie, par Don Sinibaldo de Mas, Pamphlet.—Presented by the Author.

Vocabulaire l'Idéographique Français, &c. by D. D. Pamphlet.—Presented by D. D.

Sketch of the System of Education in Practice at Bruce-Castle School, Tottenham, London.—Presented by Mr. H. Piddington on the part of the Proprietor.

The Oriental Christian Spectator.—Presented by the Publisher.

Calcutta Christian Observer for June 1844, 2 vols.—Presented by the Publisher.

Journal of the Agricultural and Horticultural Society of India.—Presented by the Society.

Journal Asiatique, for Sept. and October, 1843.—Presented by the Editors.

Journal des Savants, Nov. 1843.—Purchased.

The London, Edinburgh, and Dublin Philosophical Magazine, Nos. 154, 155 and 156.—Presented by the Editor.

Proceedings of the Geological Society of London, Nos. 95 and 96.—Presented by the Society.

The Athenæum for April 6th, 13th, 20th and 27th.—Purchased.

The Meteorological Register for May 1844.—From the Surveyor General's Office.

Read the following letter from the Curator Museum of Economic Geology and Geological and Mineralogical Departments:—

H. TORRENS, ESQ. *Secretary, Asiatic Society, &c. &c. &c.*

SIR,—I beg to report for your information, that we have received from Government but a part of our Indent for apparatus and re-agents for the use of the Museum of

Economic Geology, and that it will remain with the Society to consider how the remainder can be supplied.

In the accompanying lists, which comprise the articles still unprovided, the prices marked are European, converting, as our Calcutta Chemical dealers usually do, shillings into rupees.

The amount of the two lists herewith so calculated, is :—

	Co's. Rs.
Purchases from European shops, or to be obtained from Europe,.. ..	392 8 0
Bazar purchases, ...	12 8 0
Co's. Rs.	405 0 0
Say Co's. Rs.	400 0 0

But of this first, a part of the Indent can be reduced or dispensed with at present.

2. A part is probably not procurable here, except perhaps at a price which should not be paid unless the object was indispensably required.

3. A part may be obtained at lower prices, and a part I can present to the Laboratory from my own stock of apparatus and re-agents.

Altogether then, I should hope, that with a gradual outlay of at most Co's. Rs. 250, I shall be able to manage for a considerable time, but this outlay is really requisite; because in a Laboratory the better it is furnished, the faster the work can be carried on; and the delays of preparing or even of purchasing apparatus or re-agents at the time when wanted, even if they are then obtainable, are most wasteful and discouraging.

I should not forget, Sir, to remind you, that of the Government allowance for contingencies of the Museum, whatever can be saved, I am applying gradually to the purchase of the necessary books, and that the Laboratory series both the Society's own departments of Geology and Mineralogy as well as the Museum of Economic Geology.

I am, Sir,
Your obedient Servant,
HENRY PIDDINGTON,
Curator Museum Economic Geology, and Geological and Mineralogical Department.

Calcutta, the 3rd July, 1844.

Resolved.—That the necessary purchases for the Laboratory as explained in the lists accompanying the letter,* be authorized to the amount stated.

Read the following Letters from Messrs. W. and H. Allen and Co., the Society's Booksellers and Agents:—

HENRY PIDDINGTON, ESQ. *Assistant Secretary to the Asiatic Society.*

SIR,—We have to acknowledge the receipt of your letter of the 17th February, enclosing letters for the Vice-Chancellors of the Universities of Oxford and Cambridge,

* Which it is not worth while to print.

and likewise for Trinity College, Dublin. They have been delivered, and we have acknowledgments for the same.

The "*Britannia*," has arrived, and the six cases of Books consigned to us by her, shall be delivered agreeable to the instructions contained in Mr. Torrens' letter on the subject.

We are, Sir,

London, 29th April, 1844. Your faithful servants,

Wm. H. Allen & Co.

Henry Torrens, Esq. *V. P. and Secretary to the Asiatic Society of Bengal.*

Sir,—We have the honor to acknowledge the receipt of your esteemed favor, dated the 7th March, which reached us this morning.

We shall have much pleasure in making the arrangement you desire, with an eminent Sculptor, for the execution of a Bust of Bryan H. Hodgson, Esq. We shall make a point of seeing Mr. Hodgson soon after his arrival. You may assure the President and Members of your Society, that our best attention is at all times given to their commands. We shall address you again on the subject as soon as a Sculptor has been decided upon.

We are, Sir,

London, 6th May, 1844. Your most obedient servants,

Wm. H. Allen & Co.

The Secretary stated, that as ordered at the last meeting, the Committee of Papers had been requested to decide on what number of copies of the Sobda Ratnakar, by Baboo Goropresad Roy, the Society should itself subscribe for while recommending the work to the favorable notice of Government, and that 25 copies had been determined upon by the Committee. It was finally *Resolved*, that as proposed at the previous meeting, the Society do subscribe as above, and strongly recommend the work to the attention of Government in the Education Department.

Read the following Letter from the Secretary to the Government of India, Secret Department:—

No. 430 of 1844.

From the Secretary to the Government of India, to the Secretary to the Asiatic Society, dated Fort William, the 29th June, 1844.

Foreign Department, Secret.

Sir,—By direction of the Governor General in Council, I have the honor to transmit to you, for such notice as the Society may deem it to merit, the enclosed copy of a report by Major F. Mackeson, C. B., on the Survey of the road from Sirsa to Bahawul-

pore, with remarks on the country traversed, the nature and capabilities of the road, and the effect its opening will have upon different channels of commerce.

I have the honor to be, Sir,
Your most obedient servant,
E. CURRIE,
Secretary to the Government of India.

Fort William,
the 29th June, 1844.

Read the following Draft of a Letter to be addressed to Government, soliciting its support for M. Callery's translation of the Great Encyclopedic Dictionary of Kang-Hi:—

To T. R. DAVIDSON, Esq. *Officiating Secretary to Government of India, Home Department.*

SIR,—I am directed by the Honorable the President of the Asiatic Society to request, that you will convey to the Right Honorable the Governor General and Council, the earnest recommendation of the Asiatic Society of Bengal, in favor of the Rev. Pere Callery of Macao, now engaged in a translation of the great Chinese Encyclopedic Dictionary of Kang-Hi.

2. An Extract from the Proceedings of the Society of the 6th December 1843, is entered marginally respecting the undertaking of this great work, and the support which the Society has itself endeavoured to afford to its able and energetic projector. I have also to request, that you will lay before the Right Honorable the Governor General, the accompanying Prospectus of the work, together with a specimen of the Typographical execution of, more particularly, the Chinese characters occurring in it. The Prospectus is published, it will be observed, in English as well as French.

3. Circumstances have occurred, occasioning a casual delay in making this recommendation; but the Society does not regret this, as the progress of events in China since it took up the intention of addressing Government in behalf of Mons. Callery, has more and more tended to prove the great and all-important advantages to be derived in the intercourse of Englishmen with the Chinese, from a critical knowledge of the niceties of their language, and an intimate acquaintance with their habits, customs and modes of thought.

4. The Society is of opinion, that the creation of a comprehensive book of reference, bearing upon the above heads, would be the truest and best mode of placing such advantages within the reach of Europeans, whom the course of business, or the spirit of enterprise, may lead to the shores of China; and it is by a correct and ample abstract translation of the great Chinese Encyclopedia, that the Society think such a book of reference may be best obtained.

5. It would be a source of infinite gratification to the Society, were it permitted to inform Mons. Callery, that the patronage and support of the Government of British India had been accorded to him; and should the Right Honorable the Governor

General think fit to go even beyond this, and draw the attention of the Home Authorities to the work in question, there is no doubt but that Mons. Callery will have obtained by this double act of kindness, a degree of support of the most valuable nature to his undertaking.

I have, &c.
H. Torrens,
V. P. and Secretary, Asiatic Society.

Asiatic Society's Rooms, Calcutta, 4th July, 1844.

Read the following Letter from J. Owen, Esq. with the Prospectus to which it refers:—

H. Torrens, Esq. *Secretary of the Asiatic Society.*

Sir—I have the honor to enclose the Prospectus of a little work nearly ready for the press, illustrative of the customs and habits of that portion of the Hill Tribes bordering on Assam, known as Nagas, drawn up at the suggestion of Major Francis Jenkins, and respectfully solicit the honor of the Society's name heading the subscription list.

Should this work pay its own expenses, I shall afterwards go on with a series describing each tribe separately.

Calcutta, 28th June 1844, I have the honor to be, Sir,
Your most obedt. servant.
John Owen.

Extracts from Major Jenkins' Letter.

"From your position you have better opportunities of learning something of the habits, languages, and political divisions of that portion of this people on our N. E. frontier than any other Europeans.

"Should you be willing to adopt this suggestion, I would propose your drawing up a paper for presentation to the Asiatic Society, to whom it would be very acceptable, as it would be a valuable addition to our stock of information of the Border Tribes."

True Extracts,
Dated Sibpur, 1st February, 1842. John Owen.

The Secretary was requested to place himself in communication with Mr. Owen, so as to enable the Society to form some judgment as to the merits of the proposed work.

Read the following Letter from Don Sinibaldo de Mas, in reference to the books named therein:—

Monsieur le Secretaire.

J'ai l'honneur de vous prier de vouloir bien soumetre à l'examen de l'academie dont vous dirigez les interessants travaux l'essai ci-joint sur une des plus grandes questions qui puissant occuper l'intelligence humaine. Si je n'avais consulté que mes forces, je n'aurais pas appelé l'attention des corps savans sur un travail trop in-

complet qui ne contient que les premiers élements d'un systeme, mais la nature méme de la question que j'ai abordée me fait desirer que les idées fondamentales de mon essai soient examinées par des juges compétents.

J'ai aussi l'honneur des vous envoyer deux volumes que j'ai publié derniérement sur les Isles Philipines. C'est un rapport officiel qui fut écrit pour le gouvernement espagnol.

Je vous prie de me croire, Monsieur, avec la plus haute consideration.

Votre tres humble serviteur.

Macao, 17 *Mai de* 1844. SINIBALDO DE MAS.

The presentation was duly appreciated, and a suitable letter ordered to be addressed to the able authors of the works submitted.

Read the following Letter from the Royal Bavarian Academy of Munich:—

Translation of a German Letter from the Royal Bavarian Academy of Sciences at Munich, to the Asiatic Society of Bengal.

The Royal Bavarian Academy of Sciences at Munich being prompted by the ardent wish to extend their literary communications also to the Asiatic Society of Bengal, with which they have not hitherto been connected, have honored me with the privilege to express their sentiments with regard to this subject. I beg to asssure you, that it is as desirable to the Royal Bavarian Academy to lay the results of their own labours before the eminent members of your Society, as to be acquainted, as soon as possible, with those researches, which are made by the Asiatic Society, for the reputation as well of their members, as for the advantage of Science; while the Royal Bavarian Academy of Sciences will not fail in acquainting you with their transactions by written communications of the Secretaries of the classes, by their Bulletins which form a part of their Journal, published under the title "Gelehrte Anzeigen," and by transmitting to you their Essays and their publications, they indulge in the hope to be honored with your communications, and consider an exchange of the larger Memoirs (the series of Dissertations in complete copies,) as especially desirable.

The Royal Bavarian Academy of Sciences would most gladly enter on such an exchange, and have thought proper to state the most convenient mode of their mutual intercourse in the Appendix.

I have the honor to be, &c.

(Signed) FREYBERG.

It was referred to the Committee of Papers to recommend to the Society, what would be in its opinion the best method of meeting the wishes of the Bavarian Academy.

Read the following Letter from Hugh Cumming, Esq. addressed to the Zoological Curator:—

80, *Gower Street, Bedford Square, London, January*, 1844.

My dear Sir,—Having been informed by various of your scientific friends here, of your anxious desire of increasing the Museum of the Royal Asiatic Society, I have done myself the pleasure of forwarding by my nephew, Mr. Benson, a collection of land and fresh water Shells from the Philippine Islands, with their names, &c. collected by me there, and which I beg you will favour me by offering to the Society in my name, in exchange for other shells of India.

In the box there are 305 species and varieties, in duplicates and triplicates; to each belongs a number which refers to the accompanying list of names, localities and authors.

I presume from the high standing of the Society, that it has numerous benefactors from the gentlemen who fill the high offices under the Honorable Company, in the various parts of India, and its dependencies.

Although I have upwards of 11,000 species and varieties of Marine and Land Shells in my cabinet, I do not possess more than 10 or 12 species of land or fresh water shells that have been collected under the dominion of the Honorable East India Company.

If the Society have any duplicates of either land or fresh-water shells, which could be given to me in exchange, I should feel most obliged, and if the Society have but few species, it can make up to me in quantity in lieu of quality. I should also feel particularly obliged by the specimens being good and live ones. By this means I shall be able to make exchanges with my friends, with those which I shall not require for my own cabinet; for the collectors in England are very poor in true Indian land or fresh-water shells.

Should it lay in my power to assist the Society by further adding to its desiderata, I shall be most happy to do it.

At Mr. Reeve's request, I have sent the twelve first parts of his Conchologia Iconica, which work he began to publish last January, and as it is by far the most useful and complete work that has ever been published, and also executed in the first style; may I beg you to procure the Society's name, as a subscriber to it. The parts now sent can be kept, and the succeeding monthly parts can be received by the Society's bookseller in London. The money for those now sent can be paid by a bill on London.

Mr. George B. Sowerby, Junior, has also requested me to send his Thesaurus Conchyliorum, of which three parts have been published, and the fourth will be out on February 1st. I presume from the style of both works, that the Society will be much pleased with them. All the figures of both works are drawn and coloured by George B. Sowerby, Junior, and each of the works has been, and will be published in such a manner, as not to interfere for some years to come with each other. Each part is a complete monograph of the family figured, as far as known in Europe. These works will be most valuable to the Society's library, and a reference to all known shells.

Both Mr. Sowerby, Junior, and Mr. Reeve, requested the favour that you will be pleased to point out the utility, fidelity, and cheapness of the works. The Thesaurus can be kept, and ordered in the same manner as the Iconica.

In hopes that the Society will be pleased with the shells and the two works,

I remain, My dear Sir,

Your's truly,

HUGH CUMMING.

With reference to this proposal some conversation ensued. It was thought by some members, that generally, and as an usual practice, the system of private exchanges might be carried further than comported with the character of the Society, the objects of its institution, and the true interests of seience, which might perhaps eventually be better served by sending, at all events in the first instance, duplicates of all kinds to the Honorable the Court of Directors, from which the Society receives such warm and liberal support,* and subsequently to all national and public establishments, both English and Foreign, the Society rather taking its chance as to returns, than as now contributing to enrich private cabinets. Nothing definite was, however, proposed, but the Rev. Dr. Hæberlin undertook to draft and submit his views on the subject, so that those of other members of the Committee of Papers might also be elicited, and perhaps some definite proposal be submitted to the body of the members on the subject, which it was allowed on all sides is one of very great importance.

A curious dulcimer used by the Arracanese, was presented by W. Peacock, Esq. which excited much attention.

REPORT OF THE CURATOR OF MUSEUM ECONOMIC GEOLOGY, AND GEOLOGICAL AND MINERALOGICAL DEPARTMENTS, FOR THE MONTH OF JUNE 1844.

I should perhaps commence my report of this month by saying, that we have received from Government the following letter in relation to an indent made upon the H. C's Dispensary, and with it the articles allowed by Government.

* See also Proceedings for April 1841, No. 109, Vol. x. p. 64 and 66 at the bottom.

No. 1456.

From Under-Secretary to the Government of Bengal, to the Vice President and Secretary of the Asiatic Society, dated Fort William, 3rd June, 1844.

Sir,—I am directed to acknowledge the receipt of your letter, dated the 20th March last, submitting an indent for Chemical Apparatus and Re-agents, required for the Laboratory of the Museum of Economic Geology.

2. In reply, I am directed to state, that the Deputy Governor of Bengal having consulted the Medical Board, they have been pleased to comply with the indent to the extent shewn in the accompanying list, which specifies the articles and the quantities of them available in the Dispensary for the purpose in question.

I have the honor to be, Sir,

Your most obedient servant,

A. Turnbull,

Under-Secy. to the Govt. of Bengal.

Without entering into details which would not interest the meeting, I may say, that we have now, with what we had before purchased and provided in various ways, about two-thirds of what is required, so far to furnish our Laboratory, that generally speaking, its operations can go on when required without the loss of time and imperfection of research which arise from a deficiently provided one; and for the remaining third, which is fortunately the least expensive one, we shall be enabled I hope to supply it from the European shops and Bazars, so, as at no great cost to the Society, to avoid the loss of time and labour which the preparation of our own re-agents and apparatus entails.* It may not be out of place here to say, for it may a little enlighten many who have no conception of the difficulties attending chemical research in India, that I have recently found that it is impossible to procure even so common an article as chemically pure Carbonate of Soda in Calcutta! None of the shops having any but the common pharmacopeial drug, which always contains a little sulphate or muriate, or both. Professor O'Shaughnessy informs me, that he has also failed in finding any.

Geological and Mineralogical.—We have received from Captain Newbold, M. N. I. a valuable paper, being a "Note on a recent Fresh-water Deposit," with a few remarks on the origin and age of the Kunkur of the South of India, and supposed decrease of thermal temperature, which throws much light on the origin of this curious mineral, at least in that quarter; and it is hoped, that Captain N., with his known activity of research, will not lose sight of this subject, forming as it does, one of the great problems of Indian Geology. The paper should have early insertion in our Journal.

* See letter and resolution at p. lxiii and lxiv.

Museum of Economic Geology.

We have received here from Mr. Sanders, five bottles of mineral water near Moulmein, but I have deferred their examination, as well as every thing else of the kind, to be able to go on with the Laboratory arrangements, and the clearing off some arrears of work which have accumulated in that department.

Mr. De Garnier, at my request, has obligingly furnished the Museum with three samples of the best Naxos emery, as prepared for the use of manufacturers at home.

For all the foregoing communications and presentations, the best thanks of the Society were voted.

Proceedings of the Asiatic Society for the month of AUGUST, 1844.

Wednesday Evening, the 7th August, 1844.

The usual Monthly Meeting took place on Wednesday evening, the 7th August, at 8½ P. M. The Honorable the President in the Chair.

C. F. Buckland, Esq., C. S. was elected a Member of the Society, and the usual communication was ordered to be made to him.

New Member, Captain Mackenzie, B. N. I.

Proposed by the Honorable Sir H. T. Maddock, seconded by the Honorable the President.

The following list of books presented and purchased, was read:—

Books received for the Meeting, on the 7th August, 1844.

1. The Meteorological Register for January 1844. From the Surveyor General's Office.

2. Transactions of the Society of Arts, Vol. LIV. for 1844.—Presented by the Editor.

3. The Annals and Magazine of Natural History for 1844, Nos. 156, 157 and 158.—Purchased.

4. The London, Edinburgh, and Dublin Philosophical Magazine, 3d series, Nos. 156, 157 and 158.—Presented by the Editor.

5. The Calcutta Christian Observer, for June and August, 1844.—Presented by the Editor.

6. Journal Asiatique, ou Recueil de Mémoires 1844, No. 9.—Presented by the Editor.

7. The Oriental Christian Spectator, July 1844.—Presented by the Editor.

8. Proceedings of the Academy of Natural Sciences, two Nos. Vol. II, January and February 1844.—Presented by the Editor.

9. The Palms of British India, from the Calcutta Journal of Natural History.—Presented by Dr. W. Griffith.

10. The Athenæum for May 4th, 11th, 18th, 25th and June 1st 1844, from the Editor.

11. The Singapore Tide Register in six sheets.—From Government.

12. A general Catalogue of the Fixed Stars, from Observations made at Madras in the years 1830, 1843.—From Government.

13. Meteorological Register kept at the Honorable Company's Observatory Madras.—Presented by Government.

14. Sixty-eight spare Nos. of the Asiatic Journal for the years 1833, Nos. 12; 1834, Nos. 10; 1837, Nos. 6; 1838, Nos. 9; 1840, Nos. 12; 1841, Nos. 12; 1842, Nos. 12; 1843, Nos. 3.—Presented by John Marshman, Esq.

15. Lardner's Cabinet Cyclopædia, on Electricity, Vol. II.—Purchased.

16. Ayeen Akbery, or the Institutes of the Emperor Akber, Vol. II.—Presented by F. S. Owen, Esq.

17. General Register of the Bengal Civil Service, from 1790 to 1844.—Presented by the Author.

18. The Dabistan, or School of Manners, Translated by Shea and Troyer, 3 Vols.—From the Oriental Translation Committee.

19. Ibn Khallikan's Biographical Dictionary, translated by McGleckin de Slane, 2d Vol. From the Oriental Translation Committee.

In reference to the donation of 68 spare numbers by Mr. Marshman, the Sub-Secretary stated, that he had been fortunately enabled to supply that gentleman with one of the early numbers to complete his set, but that as these numbers were often inquired for and very scarce, though many, no doubt, might be in existence; it would be desirable to make it known that the Society would be thankful for all spare and odd copies of the Journal which might be scattered about in private hands,* and would in exchange be happy to assist in completing volumes.

Read the following letter from Messrs. W. and H. Allen and Co. the Society's London agents:—

H. Torrens, *Esq. Vice President and Secretary to the Asiatic Society of Bengal.*

Sir,—The six cases of Books consigned to our care by the "Britannia," have been duly received and forwarded to their respective addresses. The duty and other expenses on the Books will be repaid to us by the institutions receiving them. We have the pleasure to enclose you receipts for the cases.

The Heads of Trinity College, Dublin, have intimated their wish to send your Society a case of books in return for those received from you. We have offered our services in forwarding them to India.

Nothing has yet been heard of the "Earl of Hardwicke."

We have the honor to be, Sir,
Your faithful servants,
Wm. H. Allen and Co.

London, 31*st May*, 1844.

And the following from his Grace the Lord Primate of Ireland, Chancellor of Trinity College, Dublin.

H. Torrens, *Esq.*

Sir,—I beg to acknowledge the receipt of your letter accompanied with a case of books from the Asiatic Society for the Library of Trinity College, Dublin, and I am requested by the Provost and Fellows of the College, to express their thanks to the

* As in the Mofussil, whence we should be happy to pay the banghy-postage, particularly for early numbers.

Asiatic Society for this valuable and acceptable present. I am also requested to inform you, that the Heads of the University assent with pleasure to the proposal of the Asiatic Society relative to a reciprocal presentation of recent publications. An order has, in consequence, been given to their booksellers to prepare a box of books lately issued from the University Press, for immediate transmission to London, to be thence forwarded to the Society. It will contain the eleven volumes of Archbishop Usher's works already republished, and some other works. As soon as the new edition of the Archbishop's works shall be completed, another box of books will be forwarded.

I am, Sir,

With much respect, your obedient servant,

London, 13th May, 1844. John G. Armagh.

From M. de Villemain, Ministre, de l' Instruction Publique a Paris.

Monsieur, ——, J'ai reçu la lettre que vous m'avez fait l'honneur de m'écrire pour m'informer de l'envoi que vous a fait la Societé Asíatíque de Calcutta, d'une caisse de livres orientanx qui vous paraîtraient destinés á être offerts au gouvernement Fran çais.

Je vous prie, Monsieur, de vouloir bíen m'addresser ces livres á Paris, par la voie que vous jugerez la plus convenable, en ayant soin de faire suivre les frais qui résulteront de cet envoi et que j'aurai soin de faire acquitter aussitôt que les livres me seront parvenus.

Recevez, Monsieur, l'assurance de ma considération distinguée.

Le Pair de France.

Ministre de l'Instruction Publique,

Paris, le 18 *Mai,* 1844. Signature Villemain.

A Monsieur Allen, libraire de la Compagnie des Indes Orientales, á Londres.

Official receipts for similar dispatches of books were also enclosed by Messrs. Allen and Co. from the Very Reverend the Vice Chancellors of the University of Oxford and University of Cambridge, the Prussian Consul General, and the Consul General of the Netherlands.

Read the following letter addressed to the Society by W. Prinsep, Esq.

H. Torrens, *Esq., Secretary to the Asiatic Society, Calcutta.*

Sir,—With reference to the orders received from you, as a Member of both the Committees for procuring the portraits of Sir Ed. Ryan and of H. T. Prinsep, Esq., I beg leave to advise you, that being without any remittance for the purpose of paying to the artists the first half of their demand, which is the invariable custom, I have recommended to Sir Ed. Ryan and my brother the course they have adopted this day, and I have now to request that you will meet with due honor, a bill drawn at 10 days' sight in favor of Messrs. Roberts, Mitchell and Co. for Co's. Rs. 1,142-13-8, being the equivalent of £100 negociated at 1-9, the exchange of the day. The bill is signed by Sir Ed. Ryan, H. T. Prinsep and myself, and you can appropriate the half to each fund in your hands, as we shall here pay £50 to each artist on account. I am happy to say, that the likenesses of each promise to be excellent. I trust you will at once remit the remainder of each fund, so as to enable me to complete the arrangements and provide proper frames and packing cases for them.

I remain, Sir,

Your most obedient servant,

London, 7th June, 1844. W. Prinsep.

The Secretary stated that the bill had been duly honoured, and read also parts of a private communication from Mr. Prinsep, stating that the Society might have casts of the marble busts now executing of Mr. H. T. Prinsep and Sir Charles Metcalfe for £5 each, which was gladly sanctioned.

W. Prinsep, *Esq., care of Messrs.* Rickards, Little and Co. *of Bishop's Gate Street, London.*

Sir,—I have the honor, by desire of the Asiatic Society of Bengal, to acknowledge the receipt of your letter dated London the 7th June last, advising a bill of exchange in favour of Messrs. Roberts, Mitchell and Co. for Co's. Rs. 1,142-13-8, being the equivalent of £100, exchange at 1-9 per rupee, for the advance paid by you to the artists for the portraits of Sir Edward Ryan and H. T. Prinsep, Esq., which you are empowered to procure. The bill was presented on the 23rd ultimo, and paid to Messrs. Carr, Tagore and Co. on the 5th instant, to whom it was made payable by the drawers.

The balance of the subscriptions for the portraits will be remitted to you by an early opportunity, and I am requested to express the satisfaction of the Society that the likenesses promise to be excellent. I am, &c.,

Calcutta, Asiatic Society's Rooms, the 13th August, 1844. H. Torrens.

Read the following letter in reply to the Society's recommendation of M. Callery's translation :—

No. 386.

From T. R. Davidson, *Esq. Officiating Secretary to the Government of India, to* H. Torrens, *Esq. Vice President and Secretary Asiatic Society, dated the 20th July,* 1844.

Home Department.

Sir,—I am directed by the Governor General in Council to acknowledge the receipt of your letter dated 4th instant, and to state in reply, that the Government of India has already subscribed for 15 copies of Monsr. Callery's translation of the Chinese Encyclopœdia of the Emperor Kang-hi.

I have the honor to be, Sir,
Your most obedient servant,
T. R. Davidson,
Officiating Secretary to the Government of India.

Council Chamber, the 20th July, 1844.

Read the following letters from the Officiating Secretary to Government of India, and the Secretary Public Department, Fort St. George :—

No. 383.

From T. R. Davidson, *Esq. Officiating Secretary to the Government of India, to* H. Torrens, *Esq. Secretary Asiatic Society, dated the 20th July,* 1844.

Home Department.

Sir,—In compliance with the request of the Government of Fort St. George, I am directed to forward herewith for the use of the Society, a copy of the Meteorological Observations recently published at Madras.

I have the honor to be, Sir,
Your most obedient servant,
T. R. Davidson,
Officiating Secretary to the Government of India.

Council Chamber, the 20th July, 1844.

No. 577.

To the Managing Committee of the Literary Society at Calcutta.

Public Department.

Gentlemen,—I am directed by the Most Noble the Governor in Council, to transmit to you the accompanying copy of the 6th volume of the Madras Astronomical observations, recently published at this Presidency.

I have the honor to be, Gentlemen,
Your most obedient servant,
Fort St. George, 29th June, 1844. J. F. Thomas,
Secretary to Government.

Read the following letters from the Secretary to the Superintendent of Marine, and Under-Secretary to the Government of Bengal:—

No. 492.

To H. Torrens, *Esq. Secretary to the Asiatic Society.*

Sir,—I have the honor, by direction of the Acting Superintendent of Marine, to forward to you the accompanying copy of a letter No. 1147, dated the 29th April last, from the Under-Secretary to the Government of Bengal, together with copies of the Tidal Registers which accompanied it.

I have the honor to be, Sir,
Your most obedient servant,
Fort William, Marine Superintendent's Office, the 30th July, 1844. J. Sutherland,
Secretary.

No. 1147.

From Under-Secretary to the Government of Bengal, to Lieut. Col. A. Irvine, *C. B. Acting Superintendent of Marine, dated Fort William 29th April*, 1844.

Marine.

Sir,—I am directed to transmit to you, for information and record, the accompanying Tidal Registers, kept at Singapore during the months of June, July, August, September and October, 1842, and to request that copies thereof may be forwarded to the Asiatic Society.

I have, &c.,
(Signed) Cecil Beadon,
Under-Secretary to the Govt. of Bengal.

(True Copy.)
Fort William, Marine Superintendent's Office, the 30th July, 1844. J. Sutherland, *Secretary.*

Read the following paper from the Secretary to the Government of India, Foreign Department:—

No. 1542 of 1844.

From W. Edwards, *Esq. Under-Secretary to the Government of India, to the Secretary to the Asiatic Society, dated Fort William, the 6th July*, 1844.

Foreign Department.

Sir,—By direction of the Governor General in Council, I have the honor to transmit to you, for such notice as the Society may deem it to merit, the accompanying copy of

a report by Lieut. Cruttenden, Assistant Political Agent at Aden, on the Mijjertheyn tribe of Somallees, inhabiting the district forming the North-east point of Africa.

I have the honor to be, Sir,
Your most obedient servant,
W. Edwards,
Under-Secretary to the Govt. of India.

Fort William, the 6th July, 1844.

This valuable paper was referred to the Editors of the Journal for early publication.

Read a letter from Mrs. Greenlaw, widow of the late C. B. Greenlaw, Esq. presenting to the Society a handsome model of the Steamer *Enterprise* (the first steamer which came round the Cape*) carved from a piece of her keel.

Read the following letter from Dr. Wallich, Superintendent H. C. Botanical Garden, accompanying the splendid donation to which it refers :—

To H. Torrens, *Esq.*

My dear Sir,—Will you do me the favour to present to the Asiatic Society, at their next meeting, a tolerably good skull of the Hippopotamus. It was the best I could procure at the Cape. I brought it with me from thence about a month ago, and Mr. Blyth was put in possession of it soon after my arrival.

In case the Society should think that I could be of service in procuring objects of Natural History from South Africa, I should be happy to assist in the best way I could.

I have the honor to remain,
My Dear Sir,
Your sincerely,
N. Wallich.

Botanic Garden, 31st July, 1844.

Read the following note from the Revd. Dr. Hæberlin on the reference which had been made to him of the letter from the Royal Bavarian Academy of Munich :—

Memo.—The "Royal Bavarian Academy of Sciences" at Munich, has for the comparatively short period of its existence acquired a great renown for its scientific researches, which include oriental studies, and deserves, therefore, the acknowledgment of the Asiatic Society of Bengal. Having been honored by the Academy with the proposal of an interchange of our respective publications, it appears to me highly desirable for our Society, and it is to be hoped mutually advantageous, to accede to the proposal.

* In 1826.

Dr. Von Martius (in his letter,) states, that only certain parts of our Journal were accessible to the Academy. These parts being lodged in the Royal Library at Munich.

I am of opinion, and would accordingly recommend, that in token of our readiness to enter into the proposed intercommunication, we send at once (instead of completing the volumes in the Royal Library,) a complete copy of our Journal from the commencement, and engage to continue the same, as well as a copy of Researches hereafter to be published by us. At the same time, I think we should express our desire to be favored in return with all the publications of the Academy.

J. Hæberlin.

Calcutta, 23*d July*, 1844.

The Secretary remarked, that it would be very difficult now to supply a complete set of the Journal, as the early volumes were very scarce; and after some conversation it was resolved, that as complete a copy as could be obtained of the Journal, should be forwarded to the Bavarian Academy.

Read a letter from the Societé Geologique de France, expressing a wish to receive the Society's Journal, and to correspond with it.

The Secretary stated, that only two volumes of the Journal of this Society's Proceedings, vols. 1835 to 1837 had been received, and he proposed to write to them, stating this, and requesting to know what volumes it had received of the Journal, so that the two Societies might renew their very desirable exchange of works, without the chance of sending duplicates.

Read the following letter from the Rev. Mr. Mack, Serampore College, who had kindly sent the two coins to which it refers for the Society's inspection :—

My dear Sir,—The coins (one gold, and the other silver,) which were dug up in the Soonderbuns, and belong to Serampore College, will be found, I believe, to agree very closely with some of those which have been figured by Mr. Prinsep.

The gold coin was dug up on the estate lately belonging to Serampore College about the year 1835; the other was obtained about the same time, but whether from that estate or one adjoining, I cannot tell. The estate belongs to that part of the Soonderbuns on which there are few or no Soondery trees, which is not Virgin Forest, but has innumerable trees of former inhabitants. Amongst other things we found a potter's kiln, that is, a mass of little lamps or churags, and similar saucer-like dishes, which had evidently never been moved from the kiln. They were much superior to the ordinary manufacture of similar articles of the present day. The material was fine, and the surface perfectly clean and smooth, although they had lain so long in the salt soil. They appeared to me of much the same consistence as the fine

tiles and bricks I have seen in the old temples of Assam, which the present inhabitants of the province cannot imitate.

I remain,

Serampore, 6th June, 1844. Your's faithfully,

John Mack.

P.S.—My friend, Mr. Bonnaud, will oblige me by taking the coins to the Asiatic Society's Museum for you, and I shall feel obliged by their early return and the fruits of your examination of them.

The locality in which these coins were found excited much speculation; and it was agreed, that if not already published, they should be lithographed for the Journal.

Read the following letter from S. G. T. Heatly, Esq. with the specimen sheets of the work referred to.

H. Torrens, *Esq.*

My dear Sir,—I request your good offices with the Asiatic Society to obtain its permission, that I may inscribe a volume on mathematical analysis now passing through the press, with its name.

It is not ordinarily that Societies are the object of dedications, but you can appreciate the feeling which (a humble member of it,) I wish to express for the labours of the oldest scientific association in India, and nearly the only one.

The book is entitled the "Theory of Functions." I undertook it some years ago to combine into one homogeneous body, all our knowledge in that department; since then the later labours of Canchy, Lionville, Hamilton and De Morgan, working in separate veins have illustrated so many obscure points, and developed connexion between subjects apparently so dissimilar, that I resolved to commence a second edition, without publishing the first; nor has the lately completed volume of Professor De Morgan done much in the peculiar field which I have marked for my labours, unequalled though that volume be in English mathematical literature for its extent of matter, rigour of demonstration, and clearness of language.

My "Theory of Functions" will be adapted to the purposes of mathematical education, and containing all the important results of modern analysis, especially those which are essential in the pursuits of physical science.

A few pages of the first edition will enable you to judge of the work.

Your's sincerely,

August 6, 1844. J. G. F. Heatly.

The Secretary was desired to express to Mr. Heatly, that the Society would feel much gratified by his proposed dedication, and that it would look forward with pleasure to the appearance of a work of this high order in India.

Read the following letter from Capt. H. L. Bigge, 1st Assistant to the Commissioner of Assam. The curiosities to which it refers were on the table.

To H. Piddington, *Esq.*, *Asiatic Society.*

My dear Sir,—I have the pleasure to send a few curiosities from China, which, if you think them worthy the notice of the Members, you will oblige me by putting on the table for the Meeting this evening.

1 Chinese Pistol, 3-barrelled.
1 Cross Bow, ditto.
1 Pipe, 2 Lamps, and 1 Seal.
1 Deer's Head, (Chusan.)
4 Anatomical Drawings.
1 Chinese Tea Urn.
Mineralogical Specimens.
1 Model of Door Latches.

Yours sincerely,

No. 41, *Park Street.* H. L. Bigge.

The Secretary stated, that having written to Mr. Secretary Edwards for the map accompanying Major Mackeson's route to Sirsa and Bahawulpore, of which the report had been sent to the Society for publication by Government, and was now at Press, he had been informed that the map was now printing at the Government Lithographic Press, and that the Society could be supplied with copies; in return for which, he had offered to Government such number of the printed report as it might require, so that the utility of the map would be much increased by distributing the printed report with it.

He also stated, that Raja Kalee Krishna Bahadoor had sent to the Sub-Secretary for perusal, a private letter from M. Garçin de Tassy, thanking the Raja for having sent him a very rare and valuable Persian MSS. of the Atesch Kada, of which an account had been published in the last No. of the Journal of the Royal Asiatic Society of London, by Mr. Bland.

Upon enquiry, he regretted to say, that the Raja had not preserved a copy before sending it, and he requested to be authorised to procure one, if possible, for the Society's Library, which was sanctioned.

J. Owen, Esq. of Assam, presented in addition to his kind donation of the Ayeen Akberry, two balls of the opium-rags as prepared by the ryots of Assam, for sale and common consumption.

These are small, long, strips of narrow rags, on which the fresh opium being collected from the poppy head is smeared, and the whole rolled up into a ball about the size of a small hen's egg, and carried about for daily use,

or sold as merchandise in all the bazars. Opium was stated to be the most profitable crop raised by the cultivators.

An engraved proof portrait of Rammohun Roy was presented by the Sub-Secretary, and it was suggested that the Society might, with great propriety, as occasion offered, collect such portraits of remarkable individuals, whether Natives or Europeans, who have distinguished themselves in literature or science in India, and more especially of such as have also been Members of the Society.

The Secretary announced with deep regret to the Society, the death of an old and highly-talented associate, and formerly a valuable servant of the Society, Dewan Ramcomul Sen, a gentleman not less distinguished for his great attainments, his enlightened views, his steady attachment to the cause of education, and his untiring energy and industry in every good and useful work, by which the community, Native or European, could be benefited, than by his modest, and even retiring character, and extensive charity.

The friend and correspondent of Mr. Colebrooke, Professor Wilson, Mr. W. B. Bailey, and many other gentlemen formerly connected with India; he was known in Europe as here, as one possessing not only great acquirments in the literature of his country, but an ardent desire to see its children regain their ancient place amongst the families of the human race; and towards this noble end, for a whole life were his strenuous endeavours directed. Perhaps indeed with too much zeal; for there is reason to believe, that he fell a sacrifice to over-exertion in study, superadded to the labours which his highly responsible situation of Dewan of the Bank of Bengal necessarily imposed upon him.

The Honorable the President proposed, and it was agreed to *nem diss.* that a letter of condolence, expressing the deep regret of the Society, should be addressed to his family.

The following letter was in consequence addressed to Baboo Hurreemohun Sen, the son of the deceased, and is inserted here for the sake of connection:—

To Baboo Hurreemohun Sen.

Sir,—I am desired by the Honorable the President and Members of the Asiatic Society to convey to you, and to request, that you will express to the other members of

the family of your late father, the deep and unfeigned regret with which the Society has learnt his decease.

They cannot, Sir, on such an occasion refrain from testifying to you and his relatives and friends, the high esteem which his literary acquirements, his steady advocacy of the cause of native education, his many private and public virtues, and his long and valuable services to the Society had won for him from its Members, and from every friend to literature and science both in India and in Europe, to whom he was known; nor will the Society cease to cherish his name, and to deplore his loss, as one of the most distinguished and most deeply lamented of their associates.

I am, &c.

Museum, 9th August, 1844. (Signed) H. Torrens,
V. P. and Secretary Asiatic Society.

Read the following Report from the Curator of Museum Economic Geology, &c. &c.

Report of the Curator Museum Economic Geology and Geological and Mineralogical Departments, for the Month of July.

Geological and Mineralogical.

We received sometime ago from our zealous contributor, Captain Newbold, for the Museum of Economic Geology,* a remarkable red sandstone rock, from the junction of the diamond limestone and sandstone near Kurnool. This I have been occupied with, and though the results are of no great interest, they may be worth placing on record to save the labour of others, who like Captain Newbold and myself, may be struck with its appearance and remarkable smell when fresh fractured. The paper being merely chemical, would barely interest the Meeting, but may be thought worthy of insertion in the Journal.

From Dr. Spilsbury, who I rejoice to say, has kindly promised us to continue his well-known and indefatigable services, we have received five specimens of the slaty sandstone of Bundlecund, with the dendritic impressions which are now considered to be metallic, and not, as formerly, vegetable. "The locality from which these are obtained," says Dr. Spilsbury, "is Miswangso, about nine miles North of Saugor, on the high road to Jhansee and Gwalior, where it is extensively quarried for building purposes. You will observe, it varies from almost white down to brick red."

Dr. Spilsbury also announces, that he has collected specimens of the fine coal of Lameta on the Nurbudda, close to Jubbulpore, which will be soon forwarded.

Museum of Economic Geology.

Lieut. Sherwill of the Revenue Survey Department, has forwarded to us specimens of the Sitajeet of Behar. The following is the extract from his letter:—

"By to-day's dak banghy, I have despatched several specimens to your address, of a substance called by the natives Sitajeet. सिताजित It is procurable in small quantities from a range of very curious formed granite hills on the borders of the Palamow Forest, not far from the Sone river. It is found high up in the rocks in small whitish globules, is scarce, and much sought after by the natives, who with great difficulty

* We are indebted to Captain Newbold for several other contributions, but as they require examination, I have not yet been able to bring them forward.

not unattended with danger, gather it towards the end of the cold weather. It is valued as a great restorative and aphrodisiac. On the table land of Rhotasgurh I have seen it on the face of the great mural precipices, wearing the appearance of tar or pitch, or oozing from the sandstone,* but being far beyond the reach of man, it may or may not be this substance. The natives declared it is the *Sitajeet.* You will perceive mine has a strong taste of alum.

Lieut. Sherwill's specimen is on the table, and is a black aluminous shale, with an acid efflorescence of alum, contaminated with a little iron. If abundant and accessible, and with plenty of fuel at command, no doubt alum might be advantageously manufactured from it. Perhaps even by solar evaporation only? The aluminous efflorescence answers in many of its chemical characters to the Sitajeet described, and analysed by Mr. Stephenson in Vol. II. p. 321 of the Journal, but ours gives a light cloud with nitrate of silver from the excess of sulphuric acid, and the same with oxalate of ammonia, shewing, that it may contain a little lime. I also used ammonia to precipitate the alumina in the gelatinous form. Heated in a platina spoon it melts and boils up into a round dull greyish white bubble, which remains solid at a strong heat between the forceps; moistened with nitrate of Cobalt it gives the usual blue colour.

The description Lieut. Sherwill gives of the tar-like appearance of some of the exudations, much reminds us of Buchanan's description of that which he visited at Tapoban in the Rajagriha Hills in Behar. At page 255, Vol. I, of Martin's edition, he thus describes the substance itself, after the detail of the locality and the manner in which an old man of the Musahar tribe collected it before him.

"When fresh from the rock, Sitajeet is of a dirty earth colour, and is always mixed with impurities, that crumble into it from the precipice above. It it then about the consistence of new honey, and has a strong rather disagreeable smell, although it cannot be called very offensive. When kept in a bottle with a glass stopper for some months, it acquires a deeper brown colour, and becomes thicker; and exposed to the air, it may soon be made into pills. It seems to be very different from a substance which, in Nepal, is called by the same name. From the hot springs in the vicinity, and the heat of the cave below, I suspect that it exudes from the action of subterraneous fire. The natives pretend that monkies eat it, and attribute the small quantity procured to their depredations; but I think that the circumstance is doubtful, and have no doubt, that, with care and a ladder, several pounds might be procured, should it be found useful; but it owes its celebrity among the natives to its being supposed to possess the imaginary quality of an aphrodisiac. When placed on burning charcoal, it swells a little and smokes, and when heated red, is reduced to white ashes without emitting flame. It cannot I presume, therefore, be considered as a bituminous or inflammable substance, the only class of minerals to which it has any resemblance.

* This may be Mineral tar and an indication of the presence of Asphalte. I wrote to Lieut. S., requesting him to look for this mineral, of which I sent him also a specimen.

Proceedings of the Asiatic Society for the month of SEPTEMBER, 1844.

The usual Monthly Meeting was held at the Society's rooms on Wednesday evening the 4th September, H. Torrens, Esq. Vice President and Secretary in the Chair.

Captain W. L. Mackintosh, B. N. I. proposed at the last Meeting, was ballotted for, and being declared duly elected, the usual communication was ordered to be made to him.

The following gentlemen were proposed as Members :—

J. Owen, Esq.—proposed by H. Torrens, Esq. Vice President, seconded by H. Piddington, Esq.

A. C. Barwell, Esq. C. S.,—proposed by H. Torrens, Esq. Vice President, seconded by Lieut. Colonel Forbes.

As Corresponding Member,—Dr. McGowan, Medical Hospital, Ningpo,—proposed by the Revd. J. Long, seconded by S. G. T. Heatley, Esq.

The following list of books presented was read :—

1. The Meteorological Register for July 1844.—From the Surveyor General's Office.

2. Athenæum for June the 8th, 15th, 22nd, and 29th, 1844.—From the Editor.

3. The Calcutta Christian Observer for September, 1844.—By the Editors.

4. The Oriental Christian Spectator for August, 1844.—By the Editor.

5. Proceedings of the Botanical Society of London, Vol. 1, part 1.—By the Society.

6. Proceedings of the Royal Irish Academy for the year 1841-2, part 6th.—By the Society.

7. Proceedings of the Royal Society of Edinburgh for December 1841 and January 1842, Nos. 10 and 20.—By the Society.

8. Annuaire du Bureau des Longitudes 1844.—By the Bureau.

9. Connaissance des Temps, avec additions 1843, 1844 and 1845.—By the Bureau.

10. Transactions of the Royal Society of Edinburgh, vol. 15th, part 2nd.—By the Society.

11. Memoires de la Societe de Physique et d'Histoire Naturelle de Geneve, 1841-2.—By the Society.

12. Transactions of the Royal Irish Academy, vol. 19, part 2nd, 1843.—By the Society.

With reference to the presentation of the volumes by the Royal Irish Academy, it was ordered that the Journal of the Society should be sent to them, and that the Librarian should be requested to ascertain and report if any reciprocation had formerly taken place.

Read the following Circular, with the accompanying letters and resolutions of the Committee of Papers :—

No. 1.—The Secretary with reference to the annexed resignation of the Honorable the President, requests the attendance of Members of the Committee of Papers at a special meeting, to be holden at the rooms on Tuesday morning the 3rd September 1844, at ½ past 10 A. M.

H. Piddington,
Sub-Secretary.

30*th August*, 1844.

No. 2.—To H. W. Torrens, Esq. *Secretary Asiatic Society.*

Sir,—Being on the eve of my departure from India, I beg leave to place in your hands my resignation of the office of President of the Asiatic Society, and to request, that in laying it before the Committee of Papers for communication to the next general meeting, you will be so kind as to express my sincere thanks for the gratification which my connexion with it has always afforded me, and my best wishes for the success of its labors, and the continuance of its credit and celebrity throughout the scientific world.

I have the honor to be, Sir,
Your most obedient humble servant,
W. W. Bird.

Calcutta, August 20, 1844.

No. 3.—At a Meeting of the Committee of Papers held at the Society's rooms on Tuesday the 3rd September, at half-past 10 A. M.

Present:—Lieutenant Colonel Forbes; Charles Huffnagle, Esq.; Rev. J. Hæberlin; F. G. S. Heatley, Esq.; Lieutenant A. Broome, B. A.; H. Torrens, Esq. Vice President and Secretary,

Resolved.—That it be proposed to the Society at the meeting, that measures be taken to ascertain whether the Right Honorable the Governor General would be inclined to take the office of President.

2. That it be also suggested to the Society, that the Honorable Mr. Bird, our late President, be requested to sit for his Picture on his arrival in England, in order that it may be placed in the room of Meeting, as a memento of the gratitude of the Society to him, for his steady and valuable maintenance and support of its interests in all respects, both as President and as Member during thirty-three years.

3. That it be also recommended to the Society, that the charge for the Portrait be put to the head of charges general.

H. Torrens, *Vice President and Secretary.*

After some discussion, the recommendations of the Committee of Papers were adopted.

Read the following letters and statements of Accounts from Messrs. Allen and Co. the Society's London Agents and Booksellers, with reply to them from the Secretary:—

Henry Torrens, Esq. *Secretary to the Asiatic Society of Bengal.*

Sir,—We have the pleasure to hand you herewith our account current with the Society for the year ending the 30th June last. The balance is £51 : 12 : 9 in favor

of the Society. This amount we propose to retain in part payment for the bust of Mr. B. H. Hodgson, which you have commissioned us to get executed. In the event of your wishing the accounts kept separately, we shall be happy to honor your draft, at 3 months' sight, for the balance now stated to you. We shall then draw upon the Society, as we were instructed, for whatever we may pay, on account of the bust.

Dr. Busch of Bremen, has written us to say, that he has consigned a box of shells to our care for the Society, and we are requested to forward the same to Calcutta, as soon as it reaches us. This we shall attend to. In our next letter we shall be able to say how the box has been forwarded.

We have the honor to be, Sir,

Your most obedient servants,

London, July 2nd, 1844. Wm. H. Allen and Co.

Dr. .. *The Asiatic Society, Calcutta, in Account with Wm. H. Allen and Co.* .. Cr.

	On hand June 30, 1843.	Recd. since.	On hand June 29, 1844.	Sold.	Per Copy.			
Asiatic Researches. vol. 15, 4to. sewed, ..	19	0	19	0	24	0	0	0
Ditto, vol. 16, ...	9	0	8	1	0	1	4	0
Ditto, vol. 18, pt. 1, ...	5	0	4	1	12	0	12	0
Ditto, vol. 18, pt. 2, ...	8	0	8	0	0	0	0	0
Ditto, Index to first 18 vols.	20	0	19	1	0	0	12	0
Ditto, vol. 19, pt. 1, ...	31	0	28	3	0	1	16	0
Ditto, vol. 19, pt. 2, ...	38	0	34	4	0	2	8	0
Ditto, vol. 20, pt. 1, ...	29	0	27	2	0	1	4	0
Ditto, vol. 20, pt. 2, ...	37	0	33	4	0	2	8	0
Amis-ul-Musharahin, 4to. sewed, ...	3	0	3	0	12-10	0	0	0
Futwa Alemgiri, vol. 1, royal 4to. ..	1	0	1	0	24	0	0	0
Ditto, vol. 2, ...	1	0	1	0	0	0	0	0
Ditto, vol. 3, ...	3	0	3	0	0	0	0	0
Ditto, vol. 4, ...	4	0	4	0	0	0	0	0
Inayah, vol. 3, 4to.	1	0	1	0	0	0	0	0
Ditto, vol. 4, 4to.	32	0	32	0	0	0	0	0
Kifayah, vol. 3, 4to.	6	0	5	0	0	0	0	0
Ditto, vol. 4, 4to.	5	0	29	0	0	0	0	0
Mahabharata, vol. 1. royal 4to.	6	25	32	2	0	2	8	0
Ditto, vol. 2, ...	8	25	34	1	0	1	4	0
Ditto, vol. 3, ...	11	25	52	2	0	2	8	0
Index to ditto, 4 parts, ...	20	50	20	*16	5-8	4	10	8
Ditto, part 4, ...	20	0	3	0	0	0	0	0
Naishadha Charita, ...	3	0	21	0	12	0	0	0
Raja Tarangini, comp. 1 vol. royal 4to. sd.	21	0	1	0	20	0	0	0
Susruta, vol. 2, 8vo. sewed...	2	0	5	1	7-2	0	7	2
Tibetan Dictionary, 4to. sewed, ...	5	0	21	0	20	0	0	0
Mahabharata, vol. 4, royal 4to.	0	25		3	24	3	12	0
						£24	13	10
Sundry Advertising, ...					£1 18 0			
Commission 5 per cent.					1 4 8			
						3	2	8
						£21	11	2

* Distributed.
1 Index to Mahabharata, 4 p. to Library E. I. H.
1 Ditto ditto to Professor Wilson.
1 Mahabharata, vol 4, to Professor Wilson.

London, July 2, 1844.

E. E.
Wm. H. Allen, and Co.

Dr... *The Asiatic Society, Calcutta, in Account with Wm. H. Allen and Co...* Cr.

For Journal of the Asiatic Society.	No. of Copies received.	On hand June 29, 1844.	Sold.	Per Copy.	
No. 133, ...	50	16	*22	2-9	£3 0 6
—— 134, ...	50	18	20	..	2 15 0
—— 135, ...	50	17	21	..	2 17 9
—— 136, ...	50	19	19	..	2 12 3
—— 137, ...	50	18	20	..	2 15 0
—— 138, ...	50	16	22	..	3 0 6
—— 139, ...	50	20	18	..	2 9 6
—— 140, ...	50	21	17	..	2 6 9
—— 141, ...	50	24	14	..	1 18 6
—— 142, ...	50	25	13	..	1 15 9
					25 11 6
Advertising, Porterage, Booking, Postages, &c.			£2	7 0	
Commission 10 per cent.			2	11 2	4 18 2
					£20 13 4

London, 2nd July, 1844. E. E.

Wm. H. Allen and Co.

* *Distributed as under*:—12 Copies each, No. 133 to 142, Professor Wilson, Editor Asiatic Journal; Royal Society; Royal Asiatic Society; Edinburgh Philosophical Journal; Royal Institution; Philosophical Journal; Athenæum; Baron Von Hammer Purgstall; Royal Society of Edinburgh; Spectator; Professor Schlegel.

Dr. .. *The Asiatic Society, Calcutta, in Account with Wm. H. Allen and Co...* Cr.

June 30, 1843.	To Balance of Account stated,..	13	18 3	Feb. 17, 1844.	By Cash per *Murray*,	21	0 9
	Sundries duty on Mahabharata per City of *Poonah* and Shipping expences on various packages received to forward as per statement herewith, ..	30	6 3		Amount of sale of "Journal" carried here as per letter received from H. Torrens, Esq. dated Sept. 5, 1843.	32	17 0
	To Balance, ...	51	17 9	June 29,	Account sale of Oriental works as per statement herewith,	21	11 2
		£96	2 3		Account Sale of Journal of the Asiatic Society as per particulars enclosed, ..	20	13 4
						£96	2 3
					By Balance, ...	£51	17 9

London, 2nd July, 1844. E. E.

Wm. H. Allen and Co.

Henry Piddington, Esq.

Sir,—Your letter dated the 16th April, enclosing a bill of lading for a case forwarded by the *John Fleming*, for the Société Royale d'Agriculture de Lyons, has been received, and on the arrival of that vessel, the needful shall be done with it.

The Journal of the Asiatic Society shall likewise be regularly forwarded to the Society at Lyons.

We are, Sir,

Your faithful servants,

London, July 2nd, 1844. Wm. H. Allen and Co.

Messrs. W. H. Allen and Co. *Leadenhall Street, London.*

Dear Sir,—I have the pleasure to acknowledge the receipt of your letter, dated the 2nd July last, covering your account current with the Asiatic Society of Bengal closed to the 30th June last, exhibiting on that date a balance of £51 : 12 : 9 in its favor, together with averages of books. All these have been on examination found correct and satisfactory, and I am desired to say, that the Society approves of your intention to retain the amount in part payment for the bust of Mr. B. H. Hodgson, which you have been commissioned to get executed. To this sum you will please add £9 : 19 : 2, being sale proceeds of Journals up to No. 133, sold by you, on my individual account, agreeably to your averages rendered in your letter of the 30th January 1844, making together £61 : 11 : 11, but deducting therefrom £2 : 19 : 6, being the value of a set of bills drawn by me on you in favor of Mr. Bartlett, per advice of the 9th August last, which will leave a total of £58 : 12 : 5, disposable for the bust in question.

You will please convey to Dr. Busch of Bremen, the thanks of the Society for the box of shells, which on coming to hand, will be more suitably acknowledged.

I am, &c.

5th October, 1844. Henry Torrens.

Read the following letter from Baboo Hurreemohun Sen, in reply to the V. P. and Secretary's letter of 9th August:—

To H. Torrens, *Esq., Vice President and Secretary, Asiatic Society.*

Dear Sir,—In acknowledging the receipt of your very kind letter of date the 9th instant, conveying to me and the other members of my late father's family, the many expressions of regret and sorrow felt by the Society at his lamented death, I have to apologize much for the delay which, owing to circumstances over which I had no control, has been incurred in my doing so.

Allow me and the rest of the family to return you and all the other Members of that noble institution, our heartfelt thanks for their kind condolence on this occasion, and to assure you, that we highly appreciate, and are grateful for, their kind sympathy in our present distress, and more especially for the sincerity with which it is expressed. The contents of your letter, Sir, have afforded us a great consolation ; a consolation which, at such a time as this, is so much needed, and which, coming as it does, from so highly respectable a body of gentlemen, cannot fail to serve as a soothing balm to our painful hearts. It indeed gives a melancholy gratification to our mind to know,

that his loss is so deeply felt and regretted, and his services acknowledged in so very strong terms by those who form a Society which, in point of importance, value and respectability, is the first in the country, and with whom he laboured hand in hand to promote its object for many many years. Fully aware as we are of the painful feeling which this mournful event must have excited in the minds of his late colleagues in the Society, and feeling proud of such a participation, on their part, in the grief we have experienced on account of it, we cannot but be gratified by the conviction which your letter so forcibly conveys to our mind, that his services to the Society and his good qualities had so much endeared him to them, and been conducive to the interest of the institution to such a degree; and in conclusion, we beg to express our feelings of gratitude to them for so valuable a record of the opinion of his career, as well as of his talent and public and private virtues generally, a record which we shall always preserve in the family with pride and pleasure, and to remain,

Dear Sir,

Your most faithful and humble servant,

Bank of Bengal, 29th August, 1844. Horeemohun Sen.

The Secretary stated, that he had received a private note from Dr. Campbell, stating, that as authorized by the Society, a brick monument had been built over the grave of Mr. Csoma de Koros, and requesting that a marble slab might be sent up with an inscription for insertion in the space left for it. An elevation of the monument accompanied the letter. The tablet was ordered as requested.

Read the following extract of a private letter to the Secretary, from G. T. Lushington, Esq. C. S.:—

H. Torrens, Esq. *Secretary of the Asiatic Society, Calcutta.*

My dear Torrens,—I got up the other day one of the Society's Sanscrit Works, the "Naishada Kabya," 1 vol. price 6 Rs. for a native here, who says that it is incomplete, being only half of the original. Can you tell me whether there is another volume also printed, completing the work, and if there is, would you kindly send it me per dák bhangy, or make it over to my agents, Gunter and Greenaway, who will pay the expences.

G. T. Lushington.

After some conversation it was ordered, that the subject of the printing of the second volume of the Naishada be referred to the committee of Papers for report.

Read the following letter from the Secretary to Government, North West Provinces:—

No. 715.

From J. Thornton, Esq. *Secy. to Government N. W. P. to Secy. Asiatic Society, Calcutta, dated Agra, the 6th August*, 1844.

General Department.

Sir,—I am desired to place at the disposal of the Asiatic Society, and for publication in the Journal, the accompanying Note, regarding the Navigation of the Nerbudda River, compiled from such information as could be found on the records of this Government, by Mr. A. Shakespear, the Assistant Secretary.

2nd. In the reduction of the map to a size more suitable for publication, the names which are underlined should be retained, as they are mentioned in the Memoir, and are essential to a right understanding of the subject. To prevent mistakes, a separate list of them is annexed, arranged as they occur in proceeding down the stream from East to West. As many more names as is conveniently practicable should of course be inserted, but these ought not to be omitted.

I have the honor to be, Sir,
Your most obedient servant,
J. Thornton,
Secy. to Govt., N. W. P.

Agra, the 6th August, 1844.

The map, which is a splendid one on a scale of 16 miles to an inch, and forms a roll 8 feet in length, was exhibited.

With reference to the names, it was stated by the Sub-Secretary, that arrangements had been made (by numbering,) so that *all* the names would virtually be inserted in the reduced map for the Journal.

Read the following correspondence on the subject of the Madras Meteorological Registers applied for by the Society:—

No. 403.

From T. R. Davidson, Esq. *Offg. Secy. to the Govt. of India, to* H. Torrens, Esq. *Secy. to the Asiatic Society, Calcutta, dated the 27th July*, 1844.

Home Department.

Sir,—With reference to your letter without date, received in July 1843, I am directed to transmit for the information of the Asiatic Society, a copy of the correspondence specified in the margin.

To Secy. to Govts. of Bengal, &c. No. 178, dated 22d July 1843; from Secy. to Govt. Fort St. George, No. 199, dated 6th July 1844, with enclosure to ditto, dated 27th ditto.

I am, Sir,
Your obedient servant,
T. R. Davidson,
Offg. Secy. to the Govt. of India.

Council Chamber, the 27th July, 1844.

No. 51.

To J. F. Thomas, Esq. *Secy. to Govt. Fort St. George.*

Home Department, Marine.

Sir,—I am directed to transmit the accompanying copy of a letter from the Secretary to the Asiatic Society, and to request, that you will, with the permission of the Most Noble the Governor in Council of Fort St. George, issue the necessary orders to cause that Society to be furnished direct with the information therein required.

I have, &c.

(Signed) T. R. Davidson,

Fort William, the 22d July, 1843. *Offg. Secy. to the Govt. of India.*

The same to the Governments of Bengal and Bombay.

No. 199.

From J. F. Thomas, Esq. *Secy. to Govt. of Fort St. George, to the Secy. to Govt. of India, dated 6th July*, 1844.

Home Department.

Sir,—With reference to Mr. Secretary Davidson's letter of the 22d July, 1843, I am directed to forward copy of one from Lieutenant Elliot at Singapore, under date 25th April last. As it would appear, that Lieutenant Elliot's establishment is not equal to any extra labour, and that the whole of the observations required by the Asiatic Society will, "soon be published in England," the Most Noble the Governor in Council, submits for the consideration of the Government of India, that the Asiatic Society should for the present receive, as proposed by Lieutenant Elliot, only a copy of the mean results, and that instructions to this effect be issued.

I have, &c.

(Signed) J. F. Thomas,

Fort St. George, 6th July, 1844. *Secy. to Govt. Military Department.*

No. 292.

To the Military Secretary to Government, Fort St. George.

Sir,—In compliance with the Extract of the Minutes of Consultation of the 29th of August 1843, I have written to the Surveyor General of India, to forward all the copies of Magnetic and Meteorological Observations in his possession to the Secretary of the Asiatic Society, Calcutta. I hope that mean results will be considered sufficient for the present, since all the observations which are now sent to the Royal Society, will very soon be published. If I were to send complete copies of the Observations that I have the honor through you to send to the Hon'ble East India Company, the work would be just doubled, and it is as much as I can do with the aid of four assistants at the Observatory to complete the report without falling into arrears.

This will be understood if I just give an outline of the work at the Observatory: 12 instruments are observed every hour in the twenty-four, and registered in a rough observation book, from which they are entered in the day book, then abstracted in a book for the purpose, and finally fresh sheets are copied out, which are forwarded through you to the Hon'ble East India Company. Besides this, extra observations, the corrections of all the instruments, absolute determinations, the diurnal and hourly march of the instruments registered in curves; the anemometer papers and copies of our observations to all the Indian observatories, and I think it will be allowed that it

will be sufficient for the Asiatic Society for the present to receive the hourly and daily means of the instruments for the month.

Again, with reference to the tides, I send one complete copy of the curves described by the instruments, and the registry to the Hon'ble East India Company's Astronomer, Madras, for transmission through him to the Home Government, another complete copy I forward through the Honorable the Governor of the Straits to the Secretary to the Government of India, (Home Department.) Now if I might be permitted to make a suggestion, it would be to forward the remainder of the tides not yet dispatched, to the Secretary of the Asiatic Society, Calcutta, and those that have been already sent to Bengal to be handed over to him.

I hope I shall be excused in making these remarks, for it has appeared to me, that the Secretary to the Asiatic Society in calling for complete copies had neither an idea of the enormous additional labour that it would entail on the Observatories, (requiring for the purpose an extra assistant constantly copying,) nor that the whole of the observations would ultimately be published in England.

I intend to write to the same effect to the Secretary to the Asiatic Society, but I shall defer forwarding any abstracts until I have on this subject the opinion of the Most Noble the Governor in Council.

I have, &c.

Singapore, 25th April, 1844. (Signed) C. M. Elliot, *Lieut. Engineers, Superintendent Magnetic Observatory.*

(A true Copy.)

(Signed) J. F. Thomas,
Secretary to Government.

No. 380.

To J. F. Thomas, Esq. *Secretary to Government, Fort St. George.*

Home Department, Marine.

Sir,—I am directed to acknowledge the receipt of your letter No. 199, dated the 6th instant with its enclosure, and to state, that for the reasons assigned by the Superintendent of the Magnetic Observatory at Singapore, the Governor General in Council concurs in opinion with the Most Noble the Governor in Council of Fort St. George, that the Asiatic Society at Calcutta should receive, as proposed by Lieut. Elliot, only a copy of the mean results of the Magnetic and Meteorological Observations, instead of copies of the entire observations. The necessary communication on the subject will be made to the Secretary to the Asiatic Society at Calcutta.

I have, &c.

Fort William, the 27th July, 1844. (Signed) T. R. Davidson,
Offg. Secy. to the Govt. of India.

(True Copies.)

T. R. Davidson,
Offg. Secy. to the Govt. of India.

Ordered, that it be explained that the Society, fully sensible of the steady desire of Government to forward its views in all matters of utility, was

only desirous of such mean results, or details as could be afforded without inconvenience.

Read the following letter :—

No. 2,037, of 1844.

From F. Currie, Esq. *Secretary to the Govt. of India, to the Secy. to the Asiatic Society, dated Fort William, 24th August,* 1844.

Foreign Department.

Sir,—By direction of the Governor General in Council, I have the honor to transmit to you for such notice as the Society may deem it to merit, the accompanying copy of a report by Mr. B. Woode, of his proceedings during his late Tour on the Naga frontier.

I have the honor to be, Sir,

Fort William, the 24th Aug. 1844. Your most obedient servant,

F. Currie,

Secy. to the Govt. of India.

The paper was referred to the Editors of the Journal.

Read the following letter addressed under orders of the Meeting of July, (see proceedings,) to the Secretary to the Government of Bengal with its reply :—

The Secretary to the Government of Bengal, Home Department.

Sir,—By desire of the Honorable the President and Committee of Papers of the Asiatic Society, and in pursuance of a resolution passed at the Meeting of the 3d instant, I have the honor to request, that you will be pleased to submit to the Honorable the Government of Bengal, the accompanying specimen pages and certificates relative to a proposed Sanscrit Dictionary in Bengali characters, to be entitled the Sabda Ratnakar, the author of which is Baboo Goorooopresad Roy, a Pundit of much eminence, and for which he, as well as the Asiatic Society, respectfully solicit the support and patronage of Government, to enable him to carry it through the press. A copy of the Baboo's letter to the Society will be found with the certificates, and the resolution of the Asiatic Society in reference to it is noted in the margin.

The Society would desire respectfully to represent to H. H. that the work is one of immense labour, and will be of the highest utility to Bengalee students of Sanscrit, comprising as it does in itself, the essentials of several other works now only existing in MSS., and expensive and difficult to obtain, and that thus it will be in an educational point of view of most essential service to the native community, and that the Society indeed would have been happy to have given it a larger share of support, could it with reference to existing engagements and claims have done so, and were the work one of a higher, and more classic standard.

It begs further, with deference, to suggest, that the Government might probably with much public advantage confer copies of it, when published, as prizes in the Public Colleges, for which purpose it is a work most excellently adapted.

I am desired to add, in conclusion, that the Society is not aware of any modern work in Sanscrit literature which has appeared for many years, better deserving the sup-

port of the Government of India, with reference to purposes of practical utility in the study, (with the native community,) of a language so important to them.

I am, Sir,

Asiatic Society's Rooms, 12th July, 1844. H. Torrens,
V. P. and Secy. Asiatic Society.

No. 582.

From the Under-Secretary to the Govt. of Bengal, to H. Torrens, Esq. *Secretary to the Asiatic Society, dated Fort William, 27th August*, 1844.

Education.

Sir,—I am directed to acknowledge the receipt of your letter, dated the 12th ultimo, and to state, that the Deputy Governor regrets that the Government cannot subscribe for any copies of the proposed Sanscrit Dictionary, specimen pages of which accompanied your communication.

I have the honor to be, Sir,
Your most obedient servant,
Cecil Beadon,
Under-Secretary to the Government of Bengal.

Read the following letter from Mr. W. C. Colton, Assistant Librarian, presenting a mummied hand and curious knot of a tree, (forming, naturally, the figure of an animal,) to which it refers :—

To H. Piddington, Esq. *Sub-Secretary, Asiatic Society.*

Sir,—I beg leave to present to the Asiatic Society's Museum, the accompanying hand, taken from an Egyptian Mummy in one of the pyramids near Cairo, and supposed to be about three thousand years old.

Also, a curious specimen of a knot taken from a tree, in the Island of the Mauritius, in the year 1840. I have the honor to be, Sir,

Your obedient servant,

Calcutta, 11th September, 1844. W. C. Colton.

Read the following letter from the Rev. J. J. Moore, Secretary Agra School Book Society to the Sub-Secretary :—

No. 239.

My dear Sir,—I am happy to say that the two boxes of books have reached me in safety, with the exception of 9 which are injured by water and have to be rebound, however this matters little. The books for the Maharaj of Jodhpore, I have forwarded to the Political Agent, Capt. French. The cost of them I shall remit to you so soon as realized.

The bill against the Society I hope to remit a draft for, at the close of the month. I am much obliged to you for the kind trouble you have taken.

Believe me, your sincerely,

15th August, 1844. J. Moore.

Read the following letter from Dr. Mouat :—

To H. Torrens, Esq.

My dear Torrens,—Would the accompanying articles be of any use to your Museum? Intrinsically they are of no value, but as they were both brought from the field of Punniar, they may be esteemed worthy of preservation. The matchlock was

taken from a Mahratta by a soldier of the Queen's 50th at Punniar, who I believe bayonetted him. The ball was one fired from the Battery stormed by the 50th, and fell within a foot of my brother, who had it picked up and preserved as a relic of the fight.

I am collecting, or rather attempting to do so, a small Mineralogical and Geological Museum for the Medical College, and have sent home for a complete set of European specimens, classified and arranged, which I hope will arrive here shortly.

Do you think the Asiatic Society would object to make over to us any triplicate or quadruplicate specimens which may not be worth preserving by them, and are not of sufficient value to send home ; for we must be moderate in our expectations, and be content with small beginnings. I hope ultimately to see complete courses of Geology and Mineralogy given in this College, that our Students may obtain some acquaintance with these highly interesting and in this country important branches of science.

Very truly yours

Medical College, 30th August, 1844. Fred. J. Mouat.

Resolved, that the Curator in the Geological and Mineralogical Departments be desired when the arrangements of the collections will admit of it, to assist Dr. Mouat's views.

The Sub-Secretary, as Curator, stated, that (see Journal Vol. X, p. 172, Proceedings for May 1841,) he had already pointed out to the Society, this as a very proper method of disposing of spare specimens.

Read the following letter from Dr. A. Sprenger, B. M. S. :—

To the Secretary of the Asiatic Society of Bengal, &c. &c. &c.

My dear Sir,—I beg leave to send you an article for the Journal of the Asiatic Society. If you have plenty of space in your present number, I shall make it longer, adding passages which show from whence the Arabs obtained the principal articles of commerce, as for instance paper, which was manufactured at Samarcand, &c. Print this part, and let me know about the rest.

I am, your very faithfully,

Chinsurah, August 28, 1844. A. Sprenger.

The Secretary stated, that as the MSS. was much interlined, he had placed it in the hands of a good copyist, and would first return it to Dr. S. for his revisal before placing in the hands of the printers.

The Curator Geological and Mineralogical Departments stated, that having been for the most part occupied in preparatory arrangements in the Laboratory, and having nothing of note to minute, he had deferred making any report for the present month.

Proceedings of the Asiatic Society for the month of OCTOBER, 1844.

The usual monthly meeting of the Society was held on Wednesday evening the 2nd October, 1844, at 8 P. M.

The Honourable Sir H. Seton in the chair.

The following members proposed at the last meeting were ballotted for, and declared duly elected:—

A. C. Barwell, Esq. B. C. S.

John Owen, Esq.

Corresponding member, J. McGowan, Esq. Ningpo Hospital.

And the following new members were proposed:—

T. R. Davidson, Esq. B. C. S., proposed by H. Torrens, Esq. and seconded by H. Piddington, Esq.

Allan Gilmore, Esq., ditto ditto ditto.

J. P. McKilligen, Esq. ditto ditto ditto.

Captain T. Marshall, proposed by S. G. T. Heatly, Esq. and seconded by H. Torrens, Esq.

Read the following list of books presented, exchanged and purchased:—

Books presented.

1. Meteorological Register for August, 1844.—From the Surveyor General's Office.

2. Journal of the Royal Geographical Society of London, Vol. 13th, part I, 1843, London, 8vo.—By the Society.

3. Extrait du Rapport Annuel fait à la Société de Géographie de Paris, 1839.—By the Society.

4. Accroissement de la Collection Géographique de la Bibliothèque Royale, en 1841.—By the Geographical Society.

5. Journal of the Bombay Branch Royal Society, No. 7, May 1844.—By the Society.

6. Journal of the Agricultural and Horticultural Society of India, vol. iii, part i. By the Society.

7. Oriental Christian Spectator, vol. 5, No. 9, September 1844.—By the Editor.

12. Madras Journal of Literature and Science, No. 30, June 1844.—By the Society.

8. Inquiry into the Means of Establishing a Ship Navigation between the Mediterranean and Red Seas, by J. Vetch. Second edition, London, 1843.—By the Author.

9. Notation Hypsométrique ou Nouvelle Manière de Noter les Altitudes, par M. Jomard, 1840.—By the Author.

Books exchanged.

10. Annals and Magazine of Natural History, Vol. 14, Nos. 88 and 89, July and August, 1844.

11. The Athenæum, Nos. 871 to 874, July 1844.

Read the following Proceedings of the Committee of Papers :—

At a Meeting of the Committee of Papers held on 13th September at half-past 10 A. M.

Present.—The Honourable Sir J. P. Grant, the Honourable Sir H. Seton, Lieut. Col. Forbes, C. Huffnagle, Esq., S. G. T. Heatly, Esq., and Rev. Dr. J. Hæberlin.

Resolved,—That the Members of the Society be informed by Circular, that at the next Meeting a President to the Society will be elected.

2nd. That a deputation having been offered to wait upon the Hon'ble W. W. Bird, and his occupations having interfered with his receiving it at the hour proposed, the Secretary be instructed to draw up a suitable address to our late President, requesting him to make choice of an artist of reputation in England, by whom his Portrait may be taken of the Kit Cat size, to be placed in the Meeting Room of the Society, with those of his predecessors in office.

J. P. Grant, *Chairman.*

And letters as follows :—

To the Honorable W. W. Bird, Esq. *late President of the Asiatic Society of Bengal.*

Honorable Sir,—I have been instructed to apprise you, that the letter of resignation of your office of President, which I had the honour to submit at the last meeting of the Society, was received with the expression of the regret of its members, at the cessation of your connexion with a body to which you have belonged for more than three and thirty years.

The Society has, I am instructed to state, a lively sense of the value of the support and assistance you have afforded it during the time that you have held the office of its President. You, Sir, have by constant supervision of our Proceedings encouraged and stimulated the work in which the Society has been engaged, and by a judicious use of the opportunities available in your high official situation you have put the Society in a position to diffuse the results of scientific enquiry conducted by the Government, among its members, and the scientific world at large.

Anxious to possess a memento of you, the Society instruct me to request, that you will do them the favour of selecting an artist of good reputation in England, by whom your Portrait may be painted in the Kit Cat size, for the purpose of its being placed in the Meeting Room of the Society, together with those of your predecessors in the Chair of President.

The Society instruct me to beg, that you will take the further trouble of referring the artist you may select to our Agents, Messrs. W. H. Allen and Co. Leadenhall Street.

The Society, in conclusion, direct me to express their thanks and acknowledgments for the kind urbanity with which you have at all times met them, for the lively interest

which you have evinced in their pursuits, and for the steady maintenance which you have invariably afforded to their interests as a constituted body.

I am, Honorable Sir,

Your most obedient servant,

H. Torrens.

To H. Torrens, Esq. *Vice President and Secretary to the Asiatic Society of Bengal.*

Sir,—I beg to acknowledge the receipt of your letter of the 13th instant, communicating to me the thanks of the Society, for the support and assistance which I afforded them during the time I had the honor to hold the office of President, and requesting, that I would allow my Portrait to be painted for the purpose of being placed in the Meeting Room of the Society, together with those of my predecessors in the chair.

I beg you will express to the Society how sensible I am of the honor they have done me, and how gratified I feel, that the little I have been able to do for the maintenance of their interests, should be considered deserving of so flattering an acknowledgment. With every wish for the continued success of their labours.

I have the honor to be, Sir,

Your most obedient servant,

Calcutta, 17th September, 1844. W. W. Bird.

The Society then proceeded to the election of a President, when the Honourable Sir Henry Hardinge being proposed from the chair, and seconded by Lieut. Col. Forbes, was unanimously elected. It was arranged, on the suggestion of Col. Forbes, that the Secretary should be requested to ascertain from the Private Secretary, when it might be convenient for the Honourable the Governor General to receive a deputation from the Society of such members as might please to form it; and that Sir Henry Seton, as the Vice-President in the chair this evening, be requested to conduct the deputation.

Read the following report and letters submitted to the Society by the Sub-Committee for publishing Sir A. Burnes' drawings:—

The Committee for publishing Sir A. Burnes' *Drawings, with reference to their first report to the Society in July* 1843, *have now the honour to present a farther report as follows:—*

The Committee having, as authorized, added to their numbers the undermentioned members:—

Rev. J. Hæberlin,

S. G. T. Heatly, Esq.

And being now composed of the following members; viz.

H. Torrens, Esq., Charles Huffnagle, Esq., Rev. J. Hæberlin, S. G. T. Heatly, Esq., and Henry Piddington Esq., Secretary to the Committee.

Meeting on Wednesday, the 18th September, 1844.

And all the Members and Secretary being present, proceeded as follows:—

1. Read for the information of the new Members, the report of July 1843, and the following Memorandum of the state of the trust up to the present date.

Memoranda for Committee on Sir A. Burnes' *Drawings.*

1. The Committee was named in March 1841.—Journal, Vol. IX. p. 1130.

2. It decided specially, with reference to *selections* from the drawings, that, as the true object of the trust confided to the Society by Government was undoubtedly to diffuse as much as possible the knowledge which Government had acquired at a heavy expence, and also as matter of justice to the labours of the Envoy and Naturalist, as well as of convenience to future naturalists and travellers in the valley of the Indus and Affghanistan, that the *whole* of the drawings should be published; except perhaps some few very common ones, if any such were found.

3. This was duly reported and confirmed at a general meeting, but it has not been placed upon record. It is supposed to have been confirmed at the meeting of April 1841, See Journal, Vol. XI, p. 72.

4. The preparation of the plates was continued, and with extreme care, till Mr. Ballin's death, when difficulties gradually arose which have not yet been adjusted, but shortly will be so, without, it is hoped, any loss to the Society's interests.

5. Mr. Blyth arrived in September 1841, taking charge of the Museum on the 6th September, (Vol. XI, p. 755,) and this undertaking amongst other matters was then specially brought to his notice, and the drawings and finished lithographs shewn him, their cost explained, &c. He was also shewn that the Acting Curator, Mr. Piddington, had indexed the whole of Dr. Lord's notes in readiness for him to commence on the letter-press.

5. The notes of Dr. Lord were subsequently duly made over to him by the Secretary; and then, and on more than one subsequent occasion, when Mr. Blyth objected to the drawings as inaccurate, and as deviating from already known types, and proposed *correcting* them, it was distinctly explained to him that, in such case, the Society would be guilty of a breach of trust, and even of a scientific fraud; since it would publish as *the drawings* made on Sir A. Burnes' Missions, *pictures* of something which were not so: and that, as well known to him, the now anxious search of all European naturalists is exactly to find the original drawings from which local faunæ (ornithæ) had been published, in order to correct these flourishes, and interferences of artists and naturalists; who, to make better *pictures*, and reduce the birds (principally) to their fancied types and systems, had in many instances created enormous confusion, deprived the original observers of their due credit for active research and accuracy, and had even made them pass, at least as careless persons, if not as impostors; when, on the contrary, the mischief and imposture was the work of the naturalist editors, publishers and artists.

6. The Reports of the Committee in July 1843, Proceedings, Vol. XI, p. 615, will shew in all its relations that the Committee has not been to blame, and how far the Society's wishes and orders have, or have not, been acted upon.

7. The Secretary to the Committee deems it his duty to state to the Committee, that with the concurrence of the Society, the whole of these drawings, except such as were required for the artists, were placed under lock and key, and under the special charge of the Librarian, with strict injunctions that they were only to be shewn or delivered by special order, as in the case of the Mackenzie collection and other rare and valuable drawings ; the finished ones being of course at Mr. Blyth's disposition. He now learns that they have been all placed in Mr. Blyth's hands.

Dr. Roer being called in, says he knows nothing of Dr. Lord's notes, which have never been in his possession.

Resolved,—That a letter be written to Mr. Blyth, requesting within a given time, (Saturday next,) a report as to the progress made in the text for Sir A. Burnes' drawings, and as to whether Dr. Lord's notes have been recovered.

The following letter was therefore addressed to Mr. Blyth :—

To E. Blyth, Esq. *Curator Asiatic Society.*

Sir,—A meeting of the Committee for the publication of Sir A. Burnes' drawings of the Zoology of the Indus, desires to enquire, what progress you have made in the letter-press to accompany those drawings.

I am further to enquire, with reference to a statement made by you that the notes on those drawings by Dr. Lord are lost, whether you have recovered those notes, the Committee having ascertained that the notes were never in Dr. Roer's possession, and it having been proved that they were delivered to you by me, and have not, in so far as any evidence before the Committee goes to shew, been ever out of your hands.

On these points the Committee request a specific answer in writing before Saturday next the 21st instant, to enable the Committee to take early cognizance of the question.

I have, &c.

H. Torrens.

Committee adjourn to Wednesday, 25th September, 1841.

At an adjoured Meeting of the Committee for the publication of Sir A. Burnes' *Drawings, held on the 25th September* 1844, *at the Society's Rooms, at half-after* 10 *o'clock* A.M.

Present.—Rev. J. Hæberlin, Chas. Huffnagle, Esq., S. G. T. Heatley Esq., H. Torrens, Esq., V. President and Secretary, H. Piddington, Secretary to the Committee.

Read letter from Mr. Blyth.

H. Torrens, Esq. *Secretary to the Asiatic Society.*

Sir,—With reference to the first question proposed to me in your note of the 18th ultimo, I beg to inform you, that from the commencement of the present month, I have devoted as much time as my other and stringent duties would permit of to the preparation of the letter-press to accompany the publication of Sir A. Burnes' draw-

ings; and that sufficient progress has been made to warrant my undertaking to complete it in the course of a few weeks.

The MS. notes, however, I regret to add, have not been found up to the present time, but they can scarcely have been abstracted from the Museum. Their value was, indeed not great, as they consisted almost entirely of descriptions and slight dissections of well-known species, the localities of which were alone new, and these are further noted on the drawings: but I am surprised beyond measure at the non-appearance of the papers, and do not offer the foregoing opinion regarding their value as any extenuation of the annoying circumstance of our not being at present able to find them.

I have, on several occasions, looked over the papers, with the intention of preparing for the press what little could be extracted from them; and to the best of my recollection have always returned them to the charge of our late Sub-librarian Mr. F. Bouchez, since the period of whose leaving I have never consulted the MS. in question, and had no idea but that it would be immediately forthcoming when I lately applied for it.

I have the honor to be, Sir,

Your obedient servant,

Asiatic Society's Museum, September 21, 1844. E. Blyth.

Resolved,—The letter from the Zoological Curator having been read, the Sub-Committee deem it necessary to place on record for report to the Society the expression of their extreme regret and surprise at the annoying circumstance, as noted by Mr. Blyth, of the non-appearance of these notes. The Sub-Committee further desire to observe, that Mr. Blyth's assurance that the preparation of the letter-press will be completed in a few weeks is the most satisfactory declaration which it has yet fallen to their lot to report with reference to the important duty confided to them.

The Sub-Committee propose in consequence of the above assurance, to proceed with the printing of the letter-press as it is prepared, in order that the plates already finished may be published at the earliest possible date.

The report of the Committee was considered as satisfactory, and adopted by the meeting.

Read the following letter from Government, and extract of dispatch accompanying it:—

Duplicate.

No. 2288.

From the Under Secretary to the Government of Bengal, to the Vice President and Secretary to the Asiatic Society, dated Fort William, 12th September, 1844.

Sir,—I am directed to transmit the accompanying copy of a letter from the Hon'ble the Court of Directors, No. 15, dated the 29th May last, with enclosure; also a transcript of a Circular addressed to the Civil Officers in this Presidency, and to

request that the Asiatic Society of Calcutta, will supply the Government with such information regarding the antiquities, the state of the liberal and mechanic arts, and the native customs of this Presidency, as the Museum and collections of the institution may afford; besides suggesting such means as may occur to the Society, for enabling Government the better to comply with the wishes of the Hon'ble Court.

I have the honor to be, Sir,

Your most obedient servant,

(Signed) A. Turnbull,

Under Secretary to the Government of Bengal.

PUBLIC DEPARTMENT.

No. 15 of 1844.

Our Governor General of India in Council.

Para. 1.—We forward to you the copy of a letter dated 8th April 1844, addressed to us by the Royal Asiatic Society of Great Britain and Ireland, bringing to our notice the state of those interesting monuments of Antiquity, the Cave Temples of India, and soliciting our interposition to preserve them from all such causes of injury and decay as may be obviated by means within the authority of our Indian Government. With reference also to the peculiarly perishable nature of the paintings in the Caves of Ajunta, the Society is anxious that carefully executed copies of them should be made before it is too late, and as those drawings are the only authentic records that exist of many of the usages of the people of India at the probable date of their execution, it would no doubt be little creditable to an enlightened Government to suffer them to perish without an effort to perpetuate their subjects by faithful and artistic delineation. We therefore recommend it to your special consideration to determine upon and adopt such measures, either by the occasional employment of some of our talented officers, when the calls of the public service permit of it, or by such other means as may appear to you to be best calculated to ensure the procuring of good copies of the paintings in the Caves of Ajunta, and of drawings of the other Caves: using such means also for the protection of the Caves themselves against dilapidation, as may be consistent with any use to which they may have been legitimately applied.

2. We take this opportunity also of apprising you, that we are desirous of collecting a series, as ample as possible, of delineations (accompanied by short explanations) of various objects of interest and instruction, illustrative of the state of the liberal and mechanic arts in India, and of the phases, character and condition of its various tribes and people, comprising architecture, implements, costumes, &c. for our library, frequent reference being made to it, (at present with little advantage,) for such sources of information. We should think it possible, that moderate encouragement on your part would readily obtain an abundant supply of such materials from different individuals in the service of the Company.

3. Absolute accuracy being essentially necessary in the drawings, and the use of Dollond's Camera Lucida ensuring that indispensable object, we shall transmit without delay to the Government of each of the presidencies three of these instruments.

We are, &c.

(Signed)	John Shepherd,	(Signed)	Henry Alexander,
,,	Henry Willock,	,,	Robert Campbell,
,,	W. H. C. Plowden,	,,	H. Shank,
,,	J. W. Hogg,	,,	John Masterman,
,,	John Loch,	,,	C. Mills,
,,	Russell Ellice,	,,	W. H. Sykes.
,,	John C. Whiteman,		

London, 29*th May*, 1844.

The Royal Asiatic Society of Great Britain and Ireland, to J. C. Melvill, Esq.

14, Grafton Street, Bond Street, London, 8th April, 1844.

Sir,—The Royal Asiatic Society have had before them at their late meetings, a highly valuable and interesting paper on the Cave Temples of India, by James Fergusson, Esq., a gentleman of great research and knowledge in Architecture, who with a professional zeal worthy of all commendation, personally visited the most remarkable specimens of those singular structures, as well in Behar and Cuttack, where they are found in the earliest and most simple forms, as in the Western side of the Peninsula, where the most highly wrought and ornamental examples are extant. It is the principal object of Mr. Fergusson's paper to classify those remarkable structures according to the purposes for which they appear to have been designed, the parties by whom they were executed, and the dates assigned to them.

Mr. Fergusson is fully aware of the great value of the improved knowledge attained to in the reading of the ancient characters in which inscriptions are written on the rocks and temples of India; but he justly considers the ascertainment of a date, by an inscription not to be conclusive as to the age of the excavation, as where the character in which the inscription is written is more modern than the architectural features of the structure. In such cases, it is probable that the inscription denotes a new appropriation or use, rather than the original design or execution. He therefore applies to the examination of their age the test of architectural character, according to certain principles which he states in his able paper.

Mr. Fergusson is of opinion, that the earliest of the Cave Temples are the Buddhist, which he divides into two great classes, the Viharus or Monastic, and the Chaitya or Temple Caves. Among the most ancient Buddhist Caves, after those in the neighbourhood of Gya and in Cuttack, he ranks a very remarkable series, which lying out of the road ordinarily travelled, and being difficult of access, have been seldom visited, and are little known, those of Ajunta in Berar.

The first notice of these Caves is to be found in a paper by Lieutenant Alexander, printed in the 2d volume of the Transactions of the Royal Asiatic Society. The writer there remarks, (p. 365): "In most of the Caves, to compensate for the want of profuse entaille and sculptures are paintings in fresco, much more interesting, as

exhibiting the dresses, habits of life, pursuits, general appearance, and even features of the natives of India, perhaps two thousand or two thousand five hundred years ago, well preserved and highly colored, and exhibiting in glowing tints, of which light red is the most common, the crisp haired aborigines of the sect of Buddhists." He adds further on, "the high antiquity (of Buddhism,) may be satisfactorily proved both from the paintings and sculptured figures in these excavations, which exhibit traces of the existence of a woolly-haired race, now no where found on the Indian continent." Again, (p. 368): "In the gallery or passage behind the pillars are fresco paintings of Buddha, and his attending supporters with *chowries* in their hands. The thickness of the stucco is about a quarter of an inch. The colors are very vivid, consisting of brown, light red, blue and white; the red predominates. The coloring is softened down, the execution is bold, and the pencil handled freely, and some knowledge of perspective is shewn. The figures are two feet and a half, or three feet in height.

(P. 369.) "The paintings in many of the Caves represent highly interesting and spirited delineations of hunting scenes, battles, &c. The elephants and horses are particularly well drawn. On the latter two men are often seen mounted. Ram and cock fights I observed in one of the excavations. The spears are peculiar, having three knobs near the head, and there was an instrument resembling a lyre with three strings. I observed something like a zodiac; but not at all resembling the celebrated one at Dendera."

The following passages in Mr. Fergusson's paper relate to these highly interesting relics of Hindu antiquity :—

"After crossing the valley of the Taptee from the North, you approach a Ghâut of some 500 or 600 feet in height, supporting the table land of the Dekhan. The upper line of the Ghaut is flat and regular, and the wall, if I may use the expression, tolerably even, except in some places, where it is broken by ravines which extend for a considerable way into the table land above. It is in one of these ravines that the Caves of Ajeend are situated. The entrance to the ravine is nearly half a mile in width, but is gradually narrower, as you wind up it, till it terminates in a cascade of seven falls, called the Sat-Koond, the last of which may be 100 feet high, the others, together 100 more."

"Immediately below the fall the ravine makes a sudden turn to the right, and it is in the perpendicular cliff, forming the outer side of the bend, and facing the Koond, that the caves are situated, the whole series extending, as near as I can guess about 500 yards from North to South-East. * * * * * *

"No. 16. The whole of this Cave, the largest, has been covered with stucco and painted, and many of the smaller paintings on the pillars and in the panels of the roof of the aisles, remain, consisting of figures of Buddha and his disciples in various attitudes, rosettes and other ornaments; but owing to the ruined state of the front, the rain apparently has beat in, and destroyed the larger subjects. There are several inscriptions painted on the plaster, and though none remain sufficiently entire to be transcribed, yet sufficient remains to shew, that the characters are those pre-

valent subsequent to the Christian era. On the exterior face of the Cave, however, but very high up, is an inscription of some length in the pure *Nath* character, which would at once give an antiquity to the excavation of about 100 or 200 B. C. as far as such evidence can be relied on.

"No. 17, generally called the Zodiac Cave, very much resembles the last described in almost every respect. Its dimensions are 64 feet by 63, and it has 20 pillars disposed as in the other. It is not, however, so lofty; and the details of the pillars are by no means so graceful or elegant as in No. 16. The paintings, however, are much more entire, and though the colours in some places are a good deal faded, the subjects can generally be made out.

"On the right hand wall as you enter, a procession is painted: three elephants issuing from a portal, one black, one red or rather brown; and the third a white one, which seems the principal one of the group, shewing how early arose the predilection for these animals, which still exist among the Burmese and Siamese of the present day. Chattahs and flags are borne before them; and a large retinue of men armed with spears, swords and shields follow them.

"On the back wall is a hunting scene, in which a lion powerfully and well drawn, forms the principal object of attraction. There are also deer and dogs, and men on horseback and on foot without number.

"In the verandah to this Cave are some singularly interesting paintings; at one end a circular one which I at first took for a Zodiac, though on further examination I gave up the idea. Its centre is divided in eight compartments, and the outer circle into sixteen or seventeen. Each of these compartments is crowded with small figures; but what the subject is, I could not make out.

"Over the door are eight Buddhist figures sitting cross-legged, the first four are black, the fifth fairer; the next is still more so; the last fair and wearing a crown. It is remarkable that there are more black people painted in this Cave than in any of the others. The women, however, are generally fair; and the men all shades, from black to a European complexion. The roof is painted in various patterns, not at all unlike those still existing in the baths of Titus, though in an inferior style of art. I had not time, even if I had had the ability to copy these interesting paintings, and I fear any one who now visits them, will find, that much that I saw has since disappeared.

"The style of these paintings cannot of course bear comparison with European painting of the present day, but they are certainly superior to the style of Europe during the age in which they are executed. The perspective, grouping and details are better, and the story better told than any paintings I know of, anterior to Orgagna and Fiesole. The style, however, is not European, but more resembles Chinese art, particularly in the flatness and want of shadow. I never, however, even in China, saw any thing approaching its perfection.

"I looked very attentively at these paintings to try and discover if they were fresco paintings, or merely water colors laid on a dry surface, but was unable to decide the point; the color certainly is in cases absorbed into the plaster; and I am

inclined to think they may have been painted when it was first laid on, and consequently moist; but I do not think it could have been done on the modern plan of painting each day all the plaster laid on that day."

From the remarks above quoted, as well as from the personal knowledge of several Members of the Royal Asiatic Society, no doubts remain that the Caves of Ajunta contain unique specimens of Hindoo painting of an age anterior to the Christian era, and it is equally certain that time, and the use made of these places by faquirs and others, Mahomedan and Hindoo, are gradually destroying their beauty, and will soon obliterate every trace of those remains which are valuable, not only as specimens of early art, but as exhibiting the figures and habits of races long passed away, and important therefore, as illustrative of the early history of India.

The Royal Asiatic Society are anxious that before any further destruction of these singular paintings shall be effected, means may be taken to have faithful copies of them made, which they would gladly publish in their Journal, and the Council have directed me to lay the subject before the Honourable Court, with the expression of their earnest desire and hope, that instructions may be sent to the proper authorities in India, to employ some Officer in their service, as early as the opportunity shall present itself, to take such copies of them as may preserve the remembrance of these most curious and valuable remains of ancient art. I have the honour to be, &c.

(Signed) R. Clarke, *Honorary Secretary.*

(True Copies,) (Signed) T. R. Davidson,
Offg. Secretary to the Government of India.

Circular from the Under-Secretary to the Government of Bengal, to Civil Authorities.
Dated Fort William, September, 1844.

Sir,—I am directed by the Deputy Governor of Bengal to forward the annexed copy of Correspondence noted in the margin,* and with reference to the wishes of the Honourable Court of Directors therein expressed, to request that you will report whether any Cave Temples, or other antiquities exist in the ——— under your charge; and if so, that you will suggest means for preserving them from injury or decay.

2. You will of course understand, that the latter instruction only applies to such temples or buildings as are no longer used as places of worship, and have no responsible guardian appointed for their preservation. You will be careful likewise to explain the object of any researches or enquiries you may institute, in consequence of these orders, so as to prevent any misconception regarding them, on the part of the native community. I have the honour to be, &c.

(Signed) A. Turnbull,
Under-Secretary to the Government of Bengal.

(True Copies,) A. Turnbull,
Under-Secretary to the Government of Bengal.

* Dispatch No. 15, of 29th May 1844, from the Honourable the Court of Directors with Enclosures.

It was stated by the Secretary, that he had thought it right to circulate these to the Committee of Papers, who were unanimously of opinion, that it was incumbent on the Society to do all in its power to forward the views of the Honourable the Court of Directors.

Mr. Piddington with a few remarks on the necessity of employing a professional artist who alone he thought, (without any disparagement to the talents of Officers in the services,) could do justice both to the letter and the spirit of these wonderful delineations, in which so much depended not on mere copying, but upon the style of drawing and the tact of seizing what was characteristic and illustrative, especially in what related to the human figure, and to manners and customs, proposed,

"That the Society do address Government, pointing out strongly the great importance of employing a professional draftsman for the copying of the Cave Paintings, as desired by the Royal Asiatic Society."

This was seconded by S. G. T. Heatly, Esq. and carried.

The Secretary then proposed, seconded by Lieut. Col. Forbes, that the following gentlemen; viz.

W. B. O'Shaughnessy, Esq., Lieut. Col. Forbes, R. Frith, Esq., J. Fulton, Esq., Chas. Huffnagle, Esq., Revd. J. Hæberlin, E. Blyth, Esq., H. Piddington, Esq., S. G. T. Heatly, Esq., A. Webb, Esq. M.D., Capt. Marshall, Capt. Latter, H. Torrens, Esq. Secretary, be requested to act as a Special Committee, for carrying out the views of the Society in aid of the request of Government, and that they have power to add to their numbers, which was also agreed to.

Read the following letter in reply to the application made to Government by the Society, on the motion of the Rev. J. Long, for copies of any Medico-Topographical reports in possession of Government:—

No. 475.

From T. R. Davidson, Esq. *Officiating Secretary to the Government of India, to* H. Torrens, Esq. *Vice President and Secretary, Asiatic Society, dated the* 21*st September*, 1844.

Home Department.

Sir,—In reply to your letter dated 8th instant, I am directed to state, that the works required by the Society, are not amongst the records of this office.

I have the honor to be, Sir,
Your most obedient servant,

Council Chamber, the 21*st September*, 1844. T. R. Davidson,
Officiating Secretary to the Government of India.

Read the following letter from the Society's London Agents:—

Henry Torrens, Esq. *Secretary to the Asiatic Society of Bengal.*

Sir,—We beg to inform you, for the information of the Members of the Asiatic Society, that a bust of Mr. B. H. Hodgson has been commenced upon, (agreeable to the instructions conveyed in your letter of March last) by a Mr. Thornicroft, a talented Sculptor, who has been highly commended to Mr. Hodgson and to ourselves, by a party very competent to judge of such matters, having employed Mr. Thornicroft himself. The cost of the bust will be £84, in addition to which, there will be the shipping charges and insurance. As this sum is much less than the estimate given us, we beg to enquire if you think it would be desirable to appropriate any portion of the balance in the purchase of a Pedestal for the bust to stand upon. The cost of a suitable one of fine marble would be under £20; in scagliola, it would not be more than half that price. We shall be obliged by the favor of a reply by return of the Mail, as by that time the bust will be nearly completed.

We have the honor to be, Sir,
Your faithful servants,

London, 2nd August, 1844. Wm. H. Allen *and Co.*

It was decided, that as a pedestal for the bust had been already placed in the Society's Meeting Hall; the cost of importing one was needless.

Read the following acknowledgment and advice of remittance from the Secretary Agra School Book Society:—

H. Piddington, Esq. *Calcutta.*

My dear Sir,—I have the pleasure to send a draft on Calcutta for Rs. 548: 6: 6, the amount of the Asiatic Society's Bill against the Agra School Book Society. The cost of the Sanscrit Books for the Maharaja I hope also to remit soon, as I am in communication with Captain French on the subject.

I hope to hear that you have succeeded in procuring me a copy of the Sanscrit Euclid, believe me,

Yours,

4th September, 1844. J. Moore.

Read the following letter from Lieut. Yule, B. E. to the Sub-Secretary:—

H. Piddington, Esq., *Calcutta.*

My dear Sir,—You were kind enough to give insertion in the Asiatic Society's Journal, to the two notes on the iron of the Kassia hills, which I forwarded two years ago, when on the point of leaving that part of the world. Having collected a good many miscellaneous notices of the people and country during an abode of two seasons in it, it has lately struck me, that some of them were sufficiently curious to be worth publishing, and so little has been given to the public on the region (which is so interesting to me that I cannot well judge what interest it may have for others,) that

I cannot but suppose much of these notes must be new. I should be much gratified if the sheets enclosed should be thought worth printing in the Journal. If not kindly return them.

Kurnaul, September 12, 1844. H. Yule.

The beautiful and spirited pen and ink drawings which accompanied this valuable paper were greatly admired, and the paper was handed to the Editors of the Journal for early publication. On the suggestion of Lieut. Col. Forbes it was agreed to, that the Secretary should address the Military Board, requesting copies of Lieut. Yule's reports, plans and sections of the country about Chirra Poonjee.

The Secretary announced to the meeting the death of Mr. W. C. Colton, the Assistant Librarian, whose conduct during the time he had been employed, was most creditable, and rendered his loss one much to be regretted.

The Secretary presented, on the part of Dr. Roer, a translation of the Vedanta Sara, which was referred to the Editors of the Journal for publication.

The Secretary presented, on the part of J. Avdall, Esq. an Essay "On the Invention of the Armenian Alphabet," which was also referred to the Editors of the Journal.

The Secretary presented from Dr. Spilsbury, Superintending Surgeon, Sagor Division, for the Museum,

Two large silver coins, dug up at Baitool.

Two smaller coins, dug up at Hoshungabad.

A small gold coin, dug up at Jubbulpoor.

Read a paper from Captain J. W. Abbott, Artillery, Dum Dum, giving some account of the fall of an Aerolite in Khandeish. The specimen was referred to Mr. Piddington, as Mineralogical Curator, for examination and report, and the paper for incorporation with the report.

The Secretary also presented on the part of Captain Abbott, a paper "On the occurrence of Granite in the bed of the Nurbudda," which was referred to the Editors of the Journal for publication.

The Secretary also presented on the part of Col. Stacy, C. B., through Captains Wroughton, B. N. I. and Wintle, B. N. I., two splendid speci-

mens of petrified bone, probably part of the Femur of the great fossil elephant or mastodon, and a carved monumental marble slab which had formed the head-stone of a Mussulman grave. This specimen is a good one of its kind, the sculpture being elegantly executed, and the stone furnishing interesting evidences of a practice formerly common, but now extinct among the Mussulmans of India, the placing head-stones, namely, in memory of deceased persons.

Read the following letter from Captain Macleod, Assistant Commissioner, Moulmein:—

My dear Torrens,—About two years ago I sent you two images like the present from the Mekkhara Prince at Amaropoora, they were found at Rangoon; no notice having been taken of them, his Highness has sent down two more. He has likewise sent me to be forwarded to you a coin (silver) found at a place called Raleng. It is Hindoo no doubt, there being no coin in Burmah. He likewise has sent a box, containing some black and yellow earths, a parcel of stones, a bottle of water, which is labelled, "Cure for Itch," or something to that purport, "Falling on both sides of the Khand Ywa hills." I believe the specimens are from the hills near the Arracan frontier, but I have written to ask; they are nothing I believe but limestone. He likewise presents the Society with a medical work of great repute in Burmah and Siam.

He wishes me to send him some books, and asks particularly for a work on Chemistry, one on Hindoo Astronomy, one on Comets and one on Electricity. He can read English with the assistance of a dictionary. Would you kindly allow me to take the liberty of asking you to get Mr. Piddington to fill up the blanks in the enclosed note, and send it to Messrs. Ostell and Co. Mr. Piddington will know better than I do what elementary works on the subjects I have mentioned, would be most useful to the prince.

Moulmein, 3rd August, 1844.

The models, which are of coarse earthenware and of an ovoid form about six inches by four, are simply figures of Budh (Guatama,) surrounded by his usual attributes, but with a *Deva Nagree* inscription below the figure! which is probably what has excited, and very naturally, the curiosity of the Prince.*

The Secretary was instructed to meet the Prince's wishes in every way in his power.

N.B. A paper has intermediately been published upon the silver coin above noted by Lieut. Latter.

The Sub-Secretary stated, that he had forwarded to Captain Macleod, the following works; viz.

* In the Society's collection we have the converse to this. A figure of Krishna, about three feet high, carved in common sandstone, but in good preservation, with medal of Buddh, (Guatama,) on his forehead like a lady's ferroniere!—Eds.

Thomson on Heat and Electricity; O'Shaughnessy's Manual of Chemistry; O'Shaughnessy's Manual of Electricity; but that he could not find any work treating specially of Comets; and that with respect to a work on Hindu Astronomy, it was not stated if it was a European work on that subject or a Native one which was desired, and that he should communicate with Captain Macleod on the subject. The specimens had not yet been examined. He subsequently learned, that Messrs. Ostell and Co. had forwarded Bentley's Hindu Astronomy.

Read the following note from Captain Bigge, Assistant Commissioner in Assam, accompanying the presentation to which it refers:—

Tin Coins from Pahang on E. coast of Malay Peninsula, North from Singapore; 16 go to the dollar; and these were received from a fisherman off the mouth of the river, in change on a purchase of fish. To coin similar monies is severely punished by mutilation and death. The smaller coin is the Dutch doit from Batavia. J. B.

Read the following reports from the Librarian:—

To H. Torrens, Esq., *Secretary Asiatic Society.*

Sir,—I have the honour, by your direction, to report respecting the communication on the part of our Society with the Royal Irish Academy. The Royal Irish Academy, as appears from our MSS. Proceedings, is one of those eight Institutions, (viz. the Royal Society of London, the Royal Society of Edinburgh, Royal Irish Academy, Society of Antiquarians of London, Society of Antiquarians of Edinburgh, the Linnæan Society, American Philosophical Society, American Academy of Arts and Sciences) with which the Asiatic Society, March 1800, first opened an intercourse by sending them their Researches, and regularly transmitting them, whenever a new volume of the Researches was published. The Royal Irish Academy presented on their part, March 1806, a set of their Transactions, which presentation was, however, not repeated until 1837, from which time they regularly sent their periodical publications to the Society; viz. its Transactions from vol. 17 to 19, pt. 2d, (Vide Journal Asiatic Society, Oct. 1837, Nov. 1839 and 1841, No. 116,) while I do not find in our Proceedings that the Society since 1837 has, by way of return, forwarded any of its publications to the Royal Irish Academy.

I avail myself of this opportunity to forward you a list of the learned institutions which have been in communication with our Society, by sending it their publications, so far as I have been able to ascertain this from our Proceedings.

I have the honour to be, Sir,

2d October, 1841. Your most obedient servant,

E. Roer.

List of the Institutions in communication with the Asiatic Society of Bengal, from its foundation up to the present date.

A. English Societies.

1. Linnean Society of England, from 1800—1841.
2. Geological Society of England, from 1812 to the present date.
3. Society for the Encouragement of Arts, from 1808 to the present time.
4. Astronomical Society of London, from 1822 to the present time, (regular.)
5. Cambridge Philosophical Society, 1816, (not continued.)
6. Royal Asiatic Society, 1828.
7. Horticultural Society of England, since 1822, (not regular.)
8. Royal Society of London, from 1800—1838, (regular, as it appears.)
9. Antiquarian Society of London, from 1800 to the present date, (regular.)
10. Royal Society of Antiquarians of Edinburgh, from 1800.
11. Agricultural Society of England, 1828.
12. Zoological Society of London, from 1833—1843, (not regular.)
13. Athenæum of Liverpool, 1834, (not continued.)
14. Society of Plymouth, 1828, (not continued.)
15. Statistical Society of London, 1838.
16. Royal Geographical Society, from 1839 to the present time, (regular.)
17. London Electrical Society, from 1842 to the present date, (regular.)
18. British Association for the advancement of Science, 1842.
19. Edinburgh Royal Society, from 1800—1834, (not regular.)
20. Royal Irish Academy, from 1800 to the present date, (regular from 1837.)
21. Agricultural Society of Calcutta,, 1828, (irregular.)
22. Medical and Physical Society of Calcutta, 1822.
23. Bombay Royal Asiatic Branch Society.
24. Bombay Geographical Society.
25. Madras Literary Society, 1806.

B. Other European Societies.

26. Société de Caen, 1816, (not regular.)
27. Royal Academy of Caen, 1836, (not continued.)
28. Société Asiatique de Paris, from 1822 to the present date, (regular.)
29. Geographical Society of Paris, from 1825 to the present date, (regular.)
30. Société Royale de Bordeaux, 1828, (not continued.)
31. Royal Academy of Bordeaux, from 1833 to the present date, (regular.)
32. Academie Royale de Marseille, 1835 (not continued.)
33. Société Industrielle de Mulhausen, 1838, (irregular.)
34. Société de Physique et D'Histoire Naturelle de Genève, from 1833 to the present date, (regular.)
35. Société Helvetique des Sciences Naturelles, 1839, (not continued.)
36. Royal Society of Copenhagen, 1816, (not continued.)
37. Société Royale des Antiquaires du Nord, 1836.
38. Batavian Society, from 1828—1833.
39. Amsterdam Royal Institute, 1838, (not continued.)
40. Hungarian Society, 1836, (not continued.)
41. Royal Academy of Munich.

C. American Societies.

42. American Academy of Arts and Sciences, from 1795 (when presenting their memoirs.)

43. Philosophical Society of Philadelphia, from 1800 to the present date.

44. Academy of Natural Science at Philadelphia.

45. Lyceum of Natural Science of New York, 1822—1833.

46. National Institution for Promotion of Science, at Washington, 1843.

To H. Torrens, Esq. *Secretary of the Asiatic Society.*

Sir,—I beg to submit a list of the incomplete and defective works of our Library, as a Supplement to that of the periodicals, which, on a previous occasion, I had the honour to lay before the Society.

To facilitate the use of this list, I have made several divisions. The letter A contains the works, which have not yet been completed by their authors; B those, of which the contents are unconnected with the immediate objects of the Society, and to complete which is not of urgent necessity; while under C are classed the books of reference, and those which bear upon the Researches of the Society. Lastly, D, includes the works which have been presented to the Society, and the subsequent volumes of which may be expected to be forwarded to the Library, as soon as published. Those which are marked by an asterisk, have already been mentioned in our Proceedings for July 1843.

Should the Society decide on an ultimate completion of these works, I would beg to suggest, firstly, that the books comprehended under C, should be completed, and that the Librarian should be authorized to procure them in Calcutta, before the present report is printed, as the prices of the books, if known to be wanted by the Society, would in consequence be raised. I have the honour to be, Sir,

Asiatic Society's Rooms, Your most obedient servant,

2nd October, 1844. E. Roer.

List of the defective and incomplete Works, in the Library of the Asiatic Society.

A.

126. Works of Confucius, by J. Marshman, Serampore, 1809, vol. 1st.

139. Beke's Origines Biblicæ, London, 1834, 8vo. vol. 1st.

313. Arnott's Physics, London, 1825, (2 vols.) vol. 1st and 1st part of the 2d.

534. Illustrations of Indian Botany, etc. of the Himalayan Mountains, by J. F. Royle, vol. 1st.

B.

English.

357. Astronomical Observations at Greenwich in 1816, by J. Pond, 1818, part of the 2d vol.

391. American Almanac for 1836, 1838, and 1839, vols. 7, 9, 10.

637. Luxmore on Strictures, Calcutta, 1814, No. 1.

662. Lectures on Comparative Anatomy, by R. Grant, published in the "Lancet" for 1833-34, vol. 1st.

678. Nautical and Hydraulical Experiments, by M. Beaufoy, London 1834, vol. 1st.

730. The Farmer's Cabinet, Philadelphia, 1840, vol. 4th.

French.

352. Histoire Céleste Française, par J. de la Lande, Paris, 1801, tome 1er.

362. Connaissance des temps à l'usage des Astronomes, Paris, 1760-1820, (the vols. for the years 1795 and 1804 wanting.)

1152. (Heber's) Voyage à Calcutta, Traduit d'Anglais, vol. 2d.

Latin.

1593. De Rebus Britannicis Collectanea, Auct. F. Lelando, vol. 2d and 3d wanting.

C.

English.

190*a*. Elements of Hindoo Law, by T. Strange, vol. 1st.

193. Digest of Mahummedan Law, by J. Baillie, Calcutta, 1805, fol. (4 vols.) vol. 1st.

424. Outlines of the Geology of England and Wales, by W. D. Conybeare, London, 1821, part 1st.

529. Icones Plantarum Indicæ Orientalis, by R. Wight, Madras, 1838-39, 2 vols. (of vol. 1st Nos. 7 and 8 wanting.)

536. Zoological Journal, London, 1835-36, 2 vols. (complete two vol. and published at 14*l*.)

535. Description of Malayan Plants, by W. Jack, Appendix No. 3.

543. Zoological Researches, by T. Thompson, No. 1 and 4.

547. Animal Kingdom of Cuvier, with specific descriptions by E. Griffith, etc. vol. 10 wanting.

549. Illustrations of Indian Zoology, by J. E. Gray, vol. 1st and of vol. 2d parts 11, 12, 15, 20.

583. Description and Figures of 200 Fishes of the Coromandel Coast, by P. Russell, London, 1803, vol. 1st, (complete in two vols.) published at 8*l*. 8*s*.

663. The Cyclopaedia of Anatomy and Physiology, London, 1836, 2 vols. (complete in 4 vols.)

807. Reports on the State of Education in Bengal, by W. Adam, 3d Report.

836. Memoir of the Histor. Society of Pennsylvania, 1834, vol. 3d.

879. State Papers by the Earl of Clarendon, Oxford, 1767—1786, 3 vols. (vol. 2d wanting,)

1024. History of the Indian Archipelago, by J. Crawfurd, 3 vols. (vol. 1st wanting, 2*l*. 12*s*.)

1535. Archæologia, vol. 17th wanting.

1545. Antiquities of Herculaneum, translated from the Italian, by T. Martyn and J. Lattie, vol. 1st, part 1st, London, 1773.

1681. Grammar of the Arabic Language, by M. Lumsden, Calcutta, 1805, fol. vol. 1st.

1843. Dictionary of the Malay Tongue, as spoken in the Peninsula of Malacca, by J. Horviser, London, 1801, part 1st.

1846. Dictionary of the Chinese Language, by R. Morrison, Macao, 1815, vol. 1st, part 1st, and vol. 2d part 2d.

N. B.—This work is published in 7 vols. from 1815—1821. The original price of which is 11*l*. 5*s*. but it may now be obtained at 8*l*. 10*s*.

French.

581. Histoire Naturelle des Poissons, par M. de Cuvier, (1st vol. of plates wanting.)

1171. Voyage du Levant ou 1692, par M. Robert, (incomplete.)

1300. Voyage aux Régions Equinoctiales du Nouveau Continent, par A. de Humboldt, (Atlas wanting.)

1536. Géographie, par E. Mentelle et Maltebrun, (vols. 1st, 3d, 4th, 7th and 9th wanting.)

2086. Notices et Extracts des Manuscripts de la Bibliothèque Imperiale et autres Bibliothèques, Paris, 1787—1813, (10 vols.) vol. 10th wanting.

Latin.

848. Memoriæ Populorum, etc. auct. F. G. Stritter, Petropoli, 1774—1779 (vol. 2d wanting.)

897. Monumenta Germaniæ Historica, Ed. G. H. Pertz, Hanoveræ, 1826, fol. vol. 1st.

1554. Aegyptiaca, by White, Oxford, 1801, part 1st.

1915. Lexicon Biographicum et Encyclopædicum à Mustafa Ben Abdalla comp. Ed. A. Lat. Vert. G. Flügel, Leipsig, 1837, 4to. tom. ii.

D.

English.

358. Astronomical Observations at the Madras Observatory, by J. Goldingham, 1824—1827, vols. 3—5.

1421. India, by Rickard, 2 vols. (of vol. 1st p. 2d, and of vol. 2d pt. 1st and 2d wanting.)

368. Mécanique Céleste of De la Place, translated by N. Bowditch, Boston, 1829—1839, vol. 1st and 2d.

French.

* 445. Récherches sur les Poissons Fossiles, par L. Agassiz, Neuchatel, (12 livraisons,) 4, 5, 7th livraisons wanting.

* 387. Histoire Naturelle des Poissons de l'eau douce, par L. Agassiz, Neuchatel, fol. 1er livraison.

* 1256. Jacquemont's Voyage dans L'Inde, (incomplete.)

N. B.—See As. S. 1836, March and Dec. where M. Guizot, on the part of the French Government, offers to the Society those numbers of this work, which had then appeared.

* Vendidad Sade, par E. Burnouf, 11 livraisons.

* 1495. Déscription de l'Egypt, ou Récueil des Observations et Récherches. Antiquites, Déscription, tome 1er.

Ditto ditto Antiquites, Mémoires, tome 1er.

Ditto ditto Planches à ditto ditto tome 1er.

Ditto ditto Etat Moderne, tome 1er et 2d.

Ditto ditto Planches à ditto ditto

Ditto ditto Histoire Naturelle, Planches, tomes 1er et 2d.

Ditto ditto Préface Historique et Avertissement, tome 1er.

1976. Harriwansa, traduit by A. Langlois, 1 and 3 livraisons.

German.

948. Gemäldesaal der Lebensbeschreibungen grosser Moslemischer Herrscher etc. v. J. v. Hammer, Leipszig, 1837—1838,, vols. 4th and 5th.

943. Geschichte des Ormanischen Reichs v. J. v. Hammer, Pesth, 1827—1838, vol. 3d wanting.

Report of the Curator Museum of Economic Geology, and Mineralogical and Geological Departments, for the month of September.

My report for this month will be brief, for I have been still much engaged in Laboratory arrangements, which occupy more time than I anticipated.

Mineralogical and Geological.—Learning from the Introduction to Dr. Cantor's Chusan Report, that he had brought some Geological specimens with him, I deemed it my duty to make some enquiry for the collection. I learn, that it has been forwarded by the Government to the Honorable the Court of Directors. I should suggest, however, that if there be any duplicates, or the specimens admit of division, we might perhaps on application be favoured with a part of the collection; and nothing from a country so utterly unknown as China, can be without interest.

Dr. Rowe of the Artillery at Dum-Dum, sometime ago, forwarded me the four small specimens now on the table: of these two are of much interest; No. 4 is a true corundum, and No. 2 also is that variety of this little known stone which approaches to the emery of Naxos. Both these are new as Bengal minerals though found in Southern India, and I have written to Dr. Rowe for as exact an account of his locality as he can give me, for the purpose of requesting any one in the neighbourhood, and especially our active associate, Lieut. Sherwill, to investigate this spot carefully if he can visit it. A true emery corundum might be a valuable discovery if within moderate reach of carriage.

I now read Dr. Rowe's letter:—

My dear Sir,—I shall feel extremely obliged, if you will at your leisure examine the accompanying specimens, and name them for me.

No. 1.—In indenting on the Commissariat Department for a medicine called "Toorbut," a Native substitute for Jalap,* the Commissariat Agent at this station bought a quantity of the accompanying, which I of course detected not to be a root, but a fossil, which on inquiry I find a Bunneea at the bazar here had obtained to cure Rheumatism, in the Burra-bazar at Calcutta. This is all the information I can obtain of it. I should much like to know what it is, and it has occurred to me, that you might be able to enlighten me. Its locality of course we cannot learn. While sending these articles, I have taken the liberty of sending three other small specimens of rocks, picked up by myself in marching down from Benares viâ the Old Hazareebaug and Bancoora route. May I ask the favor of your naming them also for me.

Dum-Dum, 8th August, 1844. J. Rowe, *Surgeon, Artillery.*

Upon examining this curious fossil, the first impression, looking at the stalk, is that it must be a fruit, but I am inclined to think (and Dr. Wallich is so with me,) that it is not so, but that it is a petrified Zoophyte. The regular lines upon it much resemble those of some species of Cyathophyllum and Caryophyllum, and the articulation of the stem which I have been fortunate enough to obtain with some specimens, reminds us of that of some encrinites. Upon enquiry in the bazar, I find they are plentiful there; that they are brought by the Arab ships from Arabia, and called Huzoor el-é'hood.†

* The root of the Convolvulus Turpethum.

† More probably Huzor-al Loheid, *i. e.* Loheida stones? Hence, brought from Loheida?

They are sold as medicine, at 6 rupees per seer. It will be seen that amongst those I have obtained, some have parts of the matrix adhering to them, others have buds or gemmules, like the corallines, at their base; one has perhaps an incipient ramification like Cyathophyllum; another traces of a serpula adhering to it, and another the trace of a small oyster or other shell-fish; internally no trace of organisation is seen. Upon dissecting one of these in dilute muriatic acid, I find that it almost entirely dissolves, the solution being pure carbonate of lime with traces of iron, as usual in the grey coloured marbles. A small yellow, green residuum, in light flakey grains remains at the bottom of the glass, and when this was examined by the usual tests, it was found to be iron with trace of sulphur. Nothing of animal or vegetable matter, nor any siliceous spines as in the Echinidæ are traceable. We may I think call this fossil, (provisionally) *Loheidolite*, which does not pronounce upon its nature.

Museum of Economic Geology.

The following letter from the Secretary to the Government of the North Western Provinces, has been communicated to us by Government, with reference to our application for a search for Lithographic Stones.

No. 2166.

From the Under-Secretary to the Government of Bengal, to the Vice President and Secretary to the Asiatic Society, dated Fort William, 27th August, 1844.

Sir,—I am directed by the Honorable the Deputy Governor of Bengal, to transmit copy of a letter from the Secretary to the Government of the North Western Provinces, No. 733, dated the 12th instant, with its enclosures, and to request, that on the receipt of the Lithographic Stones, therein referred to, a report as to their quality may be forwarded to this office, for transmission to the Lieut. Governor of the N. W. Provinces.

I have the honor to be, Sir,
Your most obedient servant,
A. Turnbull,
Under-Secretary to the Government of Bengal.

No. 733.

From J. Thornton, Esq. *Secy. to the Govt. N. W. P. Agra, to* A. Turnbull, Esq. *Under-Secy. to the Govt. of Bengal, dated Agra, the 12th August*, 1844.

Genl. Dept. N. W. P.

Sir,—I am directed to transmit to you, for submission to the Hon'ble the Deputy Governor of Bengal, the accompanying copy of a further correspondence with Captain Stewart, Fort Adjutant of Chunar, regarding Lithographic Stones, and to beg that His Honor may be favored with a report on the quality of the stones which have been sent down by that Officer to the Asiatic Society in Calcutta.

I have, &c.

Agra, the 12th August, 1844.

(Signed) J. Thornton,
Secy. to the Govt. N. W. P.

(Copy,)

From Capt. W. M. Stewart, *Fort Adjutant, Chunar, to* J. Thornton, Esq. *Secy. to the Govt. N. W. P. Agra, dated 27th July*, 1844.

Sir,—In continuation of my letter of 20th May last, regarding the search for Lithographic Stones, I have the honor to acquaint you for the information of the Honorable the Lieutenant Governor North West Provinces, that I sent out a party to the site from whence they had been obtained before, with the view of ascertaining whether or not they may be obtained of better quality, by quarrying deeper into the stratum of white lias, instead of from the surface.

A perpendicular cut 12 feet deep has been made in two places, and four specimens of stone of different qualities have been selected and forwarded to the Secretary of the Asiatic Society, for the purpose of being tested at the Government Lithographic Press.

They are decidedly of a firmer texture and finer quality than the surface specimen sent to the Press of the Sudder Board at Allahabad; but they are still much inferior to German stone, some specimens of which were forwarded for my inspection.

It is therefore expedient to continue the search at the locality indicated by Captain Shortreede, and as the stones forwarded by him have been found to answer for Lithographic purposes, I have no doubt of ultimate success.

With the permission of the Honorable the Lieut. Governor, I should wish to avail myself of the services of Mr. C. H. Burke, late of the Revenue Survey Department, and now residing here as a pensioner; a small travelling allowance of (say) 100 Rs. per month for two months, would be sufficient for all his wants, and fully attain the object desired. I propose detaching him, provided the permission of the Lieut. the Governor is accorded, early in October.

I have the honor to forward for counter-signature, a contingent bill in duplicate for expences incurred in the late operations.

I have, &c.

Chunar, the 27th July 1844. (Signed) W. M. Stewart, *Captain, Fort Adjutant, Chunar.*

(Copy,)

No. 731.

From J. Thornton, Esq., *Secretary to the Government North Western Provinces, Agra, to Captain* W. M. Stewart, *Fort Adjutant, Chunar, dated Agra, the 12th August*, 1844.

General Department N. W. P.

Sir,—I am directed to acknowledge the receipt of your letter of the 27th ultimo, regarding the specimens of Lithographic Stones dispatched to the Asiatic Society in Calcutta, for the purpose of being tested at the Government Lithographic Press.

2. In reply I am desired to convey to you His Honor's thanks, for the exertions you are making as regards the desired investigation.

3. His Honor is pleased to authorize you to pay Mr. Burke, the individual you propose to employ in the search for Lithographic Stones, a sum not exceeding 200 rupees for the trip which he will make on this duty, at such times and in such amounts as you may think best; but this sum is not to be considered a monthly allowance, which is always likely to cause unnecessary protraction of an enquiry.

4. The Lieutenant Governor has been pleased to pass the bill submitted by you for the expense already incurred in quarrying for stones, amounting to Rupees 128 : 10; the bill in question has been sent to the Civil Auditor, who will return it to you duly audited, and the Accountant N. W. P. will be requested to instruct the Collector of Mirzapore to pay the amount to your order.

I have, &c.

Agra, the 12th August, 1844. (Signed) J. Thornton,

Secretary to the Government N. W. P.

The report on the Stones sent down has not yet been received.

Ordered—That the reports be printed, that the Secretary be requested to renew the Society's correspondence with the Royal Irish Academy, and that the deficient works be completed as soon as practicable.

For all the foregoing presentations and communications the best thanks of the Society were voted.

Proceedings of the Asiatic Society for the month of NOVEMBER, 1844.

The stated monthly meeting was held on Wednesday evening, the 6th November.

Charles Huffnagle, Esq. the senior member of the Committee of Papers, present, in the chair.

It was stated to the meeting by the Secretary that, as arranged at the last meeting, a deputation from the Society had waited on the Honourable the Governor General to announce to him his election as President.

The deputation consisted of the Honourable Sir John Grant and Sir Henry Seton, Vice-Presidents, the members of the Committee of Papers, the Secretary, and a number of members of the Society. Sir John Grant, Vice-President, informed the R. H. the Governor General of his election, observing, that the honorable post of our President had been filled by certain of his predecessors in the Viceroyalty of India, and that the Society feel assured that it would be grateful to a public man so deeply interested as was our present Governor General in the prosperity of this country, to find himself in a position to foster and superintend the proceedings of a Society, the object of which had long been the elucidation of its resources, and the better knowledge of its history, natural productions, literature, and antiquities.

The R. H. the Governor General replied: That he received the intimation of his election with feelings of gratification; that the Society was not mistaken in concluding that he was warmly interested in its proceedings, and that he accepted, with the expression of his thanks, the office of its President. He added, that the great press of business which his public duties necessarily induced, must he feared deprive him of the power of attending to his presidential functions with that degree of attention which he would otherwise have desired to give to them; but that in so far as was possible to him, he would personally superintend the labours of the Society,

and at all times and occasions do his utmost to further their progress, and to enhance the welfare and prosperity of so long established and so highly respected an institution.

The following gentlemen proposed at the last meeting, were ballotted for and declared duly elected:—

T. R. Davidson, Esq. C. S. Capt. Marshall, B. N. I.

Allan Gilmore, Esq. J. Borrodaile, Esq.

J. P. Mackilligin, Esq.

And the following new members were proposed:—

J. Alexander, Esq. C. S. proposed by C. B. Trevor, Esq. C. S. and seconded by the Secretary.

J. Furlong, Esq. proposed by the Secretary, seconded by Robert W. Frith, Esq.

The following list of books presented and purchased was read:—

Books received for the meeting of the Asiatic Society on the 6th November, 1844.

Books presented and exchanged.

1. Meteorological Register for the month of September. From the Surveyor General's Office.

2. Oriental Christian Spectator, Vol. V. No. 10. October, 1844. Bombay.—By the Editor.

3. Calcutta Christian Observer, Vol. XIII. Nos. 149-50. October and November, 1844. By the Editor.

4. Calcutta Journal of Natural History, etc., By J. M'Clelland and W. Griffith, No. 18. By the Editors.

5. London, Edinburgh and Dublin Philosophical Magazine, Nos. 159-161, for April to June, 1844. By the Editors.

6. Edinburgh New Philosophical Journal, by Jameson, No. 72. April, 1844. By the Editor.

7. Proceedings of the Royal Irish Academy for the year, 1842-43. Part 7. Dublin, 1844. By the R. I. A.

8. Report of the 13th Meeting of the British Association for the Advancement of Science, 1843. By the Association.

9. The Athenæum, Nos. 875-879, *per August* 1844.

Books Purchased.

10. Journal Asiatique, Nos. 10-12.

11. Histoire Naturelle des Poissons, par M. de Cuvier et. M. A. Valenciennes; tome xvii. 55. Paris. 1844.

12. D. D. Planches, Nos. 471-496.

13. Journal des Savans, January to May 1844.

14. History of Rome, by B. C. Niebuhr, edited by L. Smitz, London 1844. Vols. 3 and 4.

Read the following letter from Government :—

No. 684 *of* 1844.

From the Secretary to the Government of India, to H. Torrens, *Esq., Vice-President and Secretary to the Asiatic Society, dated Fort William, the 10th October* 1844.

Foreign Department—*Secret.*

Sir,—I am directed by the Governor General in Council to transmit, for such notice as the Society may deem them to merit, the accompanying "Notes on the Commerce, Revenue and Military resources of the Punjaub, taken in 1837," and furnished to Government by Major R. Leech, C.B.

2. You will be pleased to return the original Report when the Society has no further occasion for it.

I have the honor to be, Sir,
Your most obedient servant,
J. Currie,
Secy. to the Govt. of India.

Fort William, the 10th October, 1844.

The MSS. being a foolscap sized volume of some thickness, containing much interesting statistical matter, it was, after some conversation, proposed by the President, and seconded by Dr. Mouat, that the book be circulated to the Members of the Committee of Papers for suggestions as to selecting portions for publication.

Read the following letter from Government :—

No. 2640 *of* 1844.

From J. Currie, *Esq. Secretary to the Government of India, to the Secretary Asiatic Society, dated Fort William, 19th October,* 1844.

Foreign Department.

Sir,—I have the honor to transmit, for such notice as the Society may think them to deserve, the accompanying copy of a report by Captain Brodie of his Tour in the Western Naga Hills, and also copy of one by Mr. Masters on the Botany of those hills.

I have the honor to be, Sir,
Your most obedient servant,
J. Currie,
Secretary to Govt. of India.

Fort William, the 19th October, 1844.

Resolved—That the papers be circulated to the Committee of Papers.

Read a letter from Lieut. J. Latter, B. N. I. addressed to the Secretary, on the subject of the Bhuddist Coin sent round by Captain MacLeod, from Moulmein, which was referred to the Editors for publication in the Journal.

Read extracts of letters from Major T. B. Jervis, Regent's Park, accompanying some new and very beautiful specimens of Lithography and Glyphography, as follows :—

I enclose in this packet a specimen of my Lithographic press, " Argemone Mexicana," copied out of Wight's Flora, a most splendid specimen of art, and am in treaty to do all the plates for the London Royal Asiatic Society. I have spoken to Wilson, with whom I am on intimate terms, to arrange with your Society for the plates of the Asiatic Journal and Society, and any embellishments you may require, which I will execute at my Amateur press rather cheaper and quicker than you can get them done in Calcutta or England. If you approve of them, I shall be obliged by your giving these specimens as much publicity as possible, and shall be glad if I can do any thing to forward the cause of science in India. If you would communicate with my brother, Col. Geo. Jervis, chief Engineer in Bombay, I have no doubt you would get contributions from that quarter, and he would tell you exactly the cost of all that I have sent out to him, and to yourself. More beautiful lithography than that of the flower, you have never seen, and the probability is that an immense accession of information would flow in from all quarters, if only parties could get their illustrations accurately and cheaply lithographed.

I should be happy if you would refer to my brother for some most curious and valuable specimens forwarded to him of the application of Lithography to cheques, passes, receipts, &c. applicable to the Salt, Opium, and other such departments.—Papers and documents so prepared, would never be imitated, or admit of erasures without detection.

I ask your kind excuse for this brief and plain address, and should be most happy, if I could in any way express the obligation under which you have laid us.

Yours very truly,

(Signed) F. B. Jervis.

Observations of the Comparative use and merit of the various kinds of Artistical Illustration, by Major T. B. Jervis, F.R.S.

The art of *Printing* has materially contributed, in the designs of Providence, to the civilization of the world, and to the promotion of the gospel; in fulfilment of which objects we hail every improvement in this so simple and ready means of communicating our thoughts and experience to others :—yet how much, that is instructive and valuable, escapes the power of the pen! how many lovely tints, how many undefin-

able forms, and arrangements, defy description! the disposition of the fleecy cloud, the rich array of floral hues and symmetry, do but mock our imperfect conceptions of nature. Failing to give endurance to them by any descriptive process,—the art of *Printing* is confessedly incomplete; yet, the artist's skill is limited, and can only be imparted through the medium of other contrivances. *Engraving*, as a means of communicating and multiplying such artistical skill, is justly appreciated as a necessary adjunct to *Printing*, and has now been brought to a high state of perfection in England.

The impulse which has been given to every discovery, in the progress of events, for the last fifty years, and the long interval of peace, have operated mightily on all those branches which are in any way connected with chemistry, and our artists have not been slow to perceive that the strictest adherence to the symmetry of nature, to fact, to beauty, and to taste, are as intimately connected with the arts of design as a regard to the niceties of manipulation to practical success.

The earliest and rudest process of *Wood-cutting* was admitted to possess a high degree of usefulness—how short it falls of the art as now practised! and yet, perhaps, those very rude specimens were often as costly, in bygone days, as some of the woodcuts introduced, by way of embellishment, into many elaborate publications of the present time: the wood-cuts, for instance, in Loudon's works on gardening and agriculture. How exquisitely beautiful, also, are many of the little woodcuts in children's books, those of the Tract Society, for example, on special objects of Natural history. Do not such lend a fascination to the inculcation of right principles, and smooth the old rough paths of education; the eye of the teacher, or the parent, rests sweetly on them; yet far more delightfully the eye of the little ones—and the object is nobly and simply gained. At a single glance, without an effort, what would be otherwise inadequately attempted, and imperfectly employed, is pictorially communicated with every advantage.

The art of *Copper-plate engraving* was chiefly promoted as a substitute for woodcuts, by the eminent artists of the Italian school, who condescended to throw all the weight of their lofty mind and talent into the scale, and thus conferred on this art a character, which to this day, it has not yet acquired in Britain. Where, indeed, do we see persons thus occupied, though remarkable for their proficiency in design, admitted to a place in society, as persons entitled by taste, and their proper art, to the same consideration as the painter and the poet? We have been too much accustomed, hitherto, to treat this as a purely mechanical business.

Engraving on steel, as a further step to the multiplication of illustrations, has its advantages and disadvantages. A copper-plate engraving is subject to wear out, after a comparatively limited number of impressions. After some two or three thousand, the best engraving on copper is sensibly deteriorated: then, on the other hand, it can be retouched, alterations may be introduced, and these with greater ease and less expense than is supposed. But the steel engraving cannot be altered; nevertheless, it is sharper, cleaner, and more durable; and will admit, with proper care, of an indefinite number of impressions. For maps, copper-plate engraving is unquestionably to be preferred to steel engraving. For line engraving, perhaps on the whole, steel is to be preferred.

Then there are *Mezzotint*, *Aquatint*, and various other similar processes fitted principally for historical subjects, or portraits, of which it is sufficient to say, they

have all their respective merits when restricted to their respective proper objects; and then only, when committed to competent artists. A bad engraving reflects, now-a-days not so much discredit on the artist, as the party who employs him; because the highest degree of excellence, and finish, and taste, can now be attained with sufficient,—nay, we speak truly,—a very moderate remuneration for time. If such folks will have cheap work, they may overreach themselves, and for a while impose upon the public, while they, in fact, keep back the true interests of their country, and of knowledge; but let them be well advised, that we are all on the advance, and other modes will supersede these expedients, and place the meritorious talent of the engraver beyond their sordid reach.

It would seem, in adverting to the period when *Printing* and other kindred inventions were brought to light, that the Allwise Disposer had then his great design of the more extensive communication of the Gospel principally in view. At least we love to consider every event as so happily falling out, and concurring to His praise in the exercise of His sovereign love. It was at the commencement of a late and glorious revolution in the arts and sciences, when the mighty power of steam was summoned to co-oporate with human industry and intelligence, that *Lithography* came also in aid of those oriental languages which do not admit of their being so readily, or correctly, expressed in moveable metal type. Look, for instance, at the Chinese, the Persian, Arabic, Mandchû, and various characters of India and the Eastern Archipelago: these, without one exception, could never be so elegantly or exactly printed by moveable metal types; and have, in every such attempt, a certain formality and rudeness, comparable only by the relative elegance of a very fine woodcut from the hands of a modern artist, and one of the coarse woodcuts of the earliest school: but besides these, there are a great variety of subjects where softness, beauty, *and, more* than all, where economy is specially desirable, to which *Lithography* is particularly adapted. It yet remains to be seen how much more extensively this elegant and purely chemical process, as it may be called, can yet be brought; and in the performance of this, we do not hesitate to affirm also, that there is no reasonable limit to the true representation of the most exquisite and complicated works of nature and art. For maps of a superior kind, there can be no question that lithography is peculiarly fitted. Good impressions may be taken, with proper care, to the extent of some two thousand; and an unlimited number of impressions at second-hand, by transfers from the original, *or* from copper-plate engravings.

For a very great variety of illustrations, botanical drawings, and landscapes, *Lithography* possesses greater facilities and recommendations, in all cases where the number required is not great, than copper-plate engraving, woodcuts, or another remarkable art, of which we are about to speak—*Glyphography;* that is, *cœteris paribus*, the cost, number of impressions, and excellence of execution, all taken into account, *Lithography* is best suited, when the number of impressions does not exceed five hundred, or one thousand; and the chalk lithographic drawings are evidently in all cases more true to nature than aquatint, or stippled engraving on copper or steel.

But the crowning process is *GLYPHOGRAPHY*, an art for which we are indebted to the ingenuity of Mr. Edward Palmer, whose attention had been early directed to other methods of multiplying engravings by the Electrotype process. Here is a simple, efficacious, and universal method of perpetuating recollections, facts, and ideas; possessing at the same time some peculiar recommendations to public notice; in its

comparative cheapness, the readiness with which it can be carried on, the high degree of perfection to which it may be brought, in the hands of competent persons; its general applicability; lastly, and principally, that it is an art which requires very little study or instruction.

With these prefatory remarks we invite attention to the specimens now submitted, and to the volume published by Mr. Palmer, price 4rs., trusting that these will find many admirers in India and China; and this valuable art meet with every encouragement from the Government, and the community, European and Native. Further information may be had on application to Major T. B. Jervis, who is appointed sole agent for Mr. Edward Palmer, for India and China. A small volume, descriptive of Glyphography, is now before the public—and with these particulars they have likewise an opportunity of estimating with tolerable exactness the cost of any other work by the expense of such specimens: as of those also in Lithography and Engraving, by similar illustrations of various kinds.

Referred to the Committee of Papers for communication with Major Jervis.

Read the following extract from a letter addressed to the Sub-Secretary by Lieut. Baird Smith, B. E. Delhi Canal Department.

I have had an interesting discovery lately in a second submerged town or village, about two miles below Behut, in the bed of the Muskurra river, one of the mountain torrents that drain the tract of country at the base of the lower Himalayan range. I have got a number of coins, household utensils, mill stones, silver bangles, and many other things from the spot. These articles were found about 6 feet beneath the surface of the ground, and were exposed in consequence of the Muskurra changing its course, and cutting away its bed and banks to a considerable depth. I am told that a large quantity of jewellery and much silver coin were discovered by people who now conceal them. I intend to extend the excavations, and to take measures for securing what may then be discovered. The coins I have obtained are of silver and copper, in excellent preservation and of Mahommedan types. Those found at Behut, were generally of pure Hindoo character, and this latter place has evidently been buried at a much earlier date than the one now discovered. I have no doubt that farther examination of the locality will lead to results of interest. If so, I may put them in form, and send them to you.

21*st August*, 1844. BAIRD SMITH.

The Secretary was authorised to address Lieut. Smith, to know what the extent of work in the buried village might be, and as to the probable cost of the whole, with a view to the Society's taking a share in what might be found.

Read extract of a letter from E. H. Lushington, Esq. C. S. addressed to the Secretary.

I send you a stone on which are cut some Arabic letters, but which neither I or any one in the neigbourhood can decypher.

Should you discover that the stone contains matter of no greater import than the one discovered by Mr. Pickwick, you must forgive me on the score of ignorance.

Should however, the contrary be the case, I shall have much pleasure in sending the Society by the first opportunity some more slabs, &c. which were shewn me buried in the earth near a village, about 12 miles hence. The village is full of old temples, &c. and I shot a snake near one of them, upwards of 17 feet long, but I regret than its skin was so much injured as not to be worth the keeping.

Jessore, Monday 30th. EDWARD H. LUSHINGTON.

The inscription consists of excerpts from the third chapter of the Koran, called the IMRAN, selected, as the Secretary observed, with special reference to the character of the majority of the early frequenters of the mosque in which it must have been placed, who as new converts to Islamism, are exhorted by texts declaratory of the corrupting influence of idol worship, declarations of the Majesty and power of the one God, and denunciations against unbelievers, to avoid relapsing into religious error. A copy was ordered to be sent to Mr. Lushington, with the best thanks of the Society.

Read the following letter from Dr. McGowan, of the Ningpho Hospital, with a translation of the impression taken from one of the compartments of the great bell presented to the Bishop of Calcutta by Captain Warden, see Journal Asiatic Society, Proceedings for May 1844.

The Secretary remarked upon the curious evidence given in the lists of titles, offices, and distinctions thus perpetuated in metal, of the high value attached by the Chinese to honorary distinctions for literary and official merits.

H. TORRENS, ESQ., *V. P. Asiatic Society of Bengal, &c.*

DEAR SIR,—I send the accompanying Translation for the Bengal Asiatic Society, regretting that it is not of greater value.

Should the Society send me the remainder of the inscription on the Bell, so that it will reach me without a heavy postage, I shall feel happy in furnishing them a complete translation.

Willing to promote the great objects of this parent institution as far as I can in this remote theatre of its operations,

I remain,

Your's truly,

Hongkong, 29th August, 1844. D. J. MACGOWAN.

Translation of a Portion of the Inscription on the Ningpo Bell at Calcutta, by D. J. Macgowan, *M. D. of the Missionary Hospital at Ningpo.*

Dr. Macgowan presents his compliments to the Asiatic Society of Bengal, and begs their acceptance of the subjoined translation of the inscription (kindly furnished him by its Secretaries,) copied from the Chinese bell from Ningpo, now in Calcutta.

Dr. Macgowan regrets that the portion copied should have been merely a list of the principal Mandarins of the district, with a list of the subscribers who contributed money for the casting of this, the principal ornament of one of their splendid temples.

The remaining portion of the inscription is doubtless of a religious character, though it may contain passages of historical interest, as bells are the only ancient monuments the Chinese possess.

Should the Asiatic Society desire a complete translation of the inscription, Dr. M. will be happy to accede to their request.

Translation.

"Wangson, Judge of Chekeang, inspector of Ningpo, Shadu Shing—Tacchoo, superintendent of customs and overseer at Tungling raised one step, and recorded seven times.

"Sickchaun, Acting Judge of Chickeang, inspector of Ningpo, Shadu Shing and Toechow, acting receiver of customs, and prefect of Ningpo, twice.

"Leongkemfuh, Marine Magistrate of Ningpo, Portmaster, Assistant Prefect residing at Taetsung, raised one step.

"Chowcheying, Salt Inspector of Ningpo district, and assistant in the Hydraulic department.

"Footan, by Imperial appointment, assistant prefect and Magistrate at the Kin country in Ningpo district, raised three steps and recorded three times.

"Chinymuhang, a graduate of the first degree and Professor.

"Chukwongue, instructor of the Ningpo College, raised one step and twice recorded."

The three sons of Wootingseang, of the Hongchoo foundry, made the bell (date not on this part of the inscription.)

Subscribers' Names.

"Wangueiching, Letingsïeang, Kaduteen Seeng, Legeseih, Weishetow, Chinchethon, Lemkiashoon, Kwongheongtring, Lepengson, Sinchoonping, Chinkaemhuy, Chinchesen, Choe Choonuchug, Linkinunch, Lekoetoes, Lenkengans Chinyungseih Chinkeho, Leahynensih, Langheanyut, Chingpangpoou, Gomyongchow, Weiuchuykmo, Tenshoow, Wongwhongmong, Linpintro, Wootoque, Chinchousee, Chinkeangshan, Tsangpongshe, Chonghunping, Tangpihdung, Henlungshun, Wangmonghd, Modurhepa, Taytajin Tungmanghe, Chingmankmang.

"All the Buddhas through all ages."

Resolved—That the whole of the inscription be taken off, and sent for translation and subsequent publication in the Journal.

Read a letter from Captain Newbold, M. N. I. Asst. Commr. Kurnool, Madras Territory, accompanying a note on the Ajaib ub Muklukhat.

This curious and interesting paper was referred to the Editors of the Journal for early publication, that it may have also the advantage of Dr. Sprenger's comments.

Read the following letter from J. Marshman, Esq. Serampore, to the Sub-Secretary.

H. Piddington, Esq.

My dear Sir,—I annex to this note an extract of a letter I have just received from Mr. Burgess, an American Missionary at Ahmedabad. He has begun in good earnest the pursuit of Oriental literature. Could you assist him to a copy of the number he requires, the value of which I shall be most happy to remit to the bookseller. He also asks me whether the Journal is taken in by the Oriental Society, lately established in Boston, and indeed whether a single copy is sent to America. He also adds, that it is strange not a copy can be procured at Bombay.

John Marshman.

"Shall I be pardoned in asking you to procure for me, or perhaps send this note to the proper agent who will despatch to me a Number of the Asiatic Journal published in Calcutta, containing a list of Sanscrit words, which correspond with Greek and Latin words, &c. (I do not know the title of the article or the No. of the Journal in which it is found,) which I think has been printed during a year past. I have understood that a more extensive comparative list of Sanscrit words with other Languages, has lately been published, and if possible I wish to procure it."

The No. of the Journal was ordered to be supplied for Mr. Burgess, and that arrangements should be made to supply the Journal to persons desirous of purchasing it on that side of India.

Read the following letters from J. S. Owen, Esq. accompanying the different specimens to which they refer.

H. Torrens, Esq., *Secretary Asiatic Society.*

Sir,—I have the pleasure to forward for the Society's inspection and acceptance, a few nuts of a new species of Areca *catechu* (palm,) just arrived from the Naga hills.

Calcutta 29th October, 1844. John Owen.

H. Torrens, Esq., *Secretary Asiatic Society.*

My dear Sir,—I beg to hand you for the Society's inspection and acceptance, some juice from the "*Ficus elastica*," of the Naga hills, which has just arrived from that quarter. I am inclined to think it will be found of a very superior quality.

Also some juice from the *Mackoi,* (Assamese) or *Messua Ferræa, Linn.* The difference in color is solely attributable to age, the transparent piece being of young exudation, and the more dark one, is I should say of about three years growth.

JOHN OWEN.

To H. TORRENS, ESQ., *Secretary Asiatic Society.*

SIR,—I have the pleasure to send you some musters of the most valuable barks with portions of wood attached to each.

They are from the Naga hills, and I much regret that more have not arrived.

26*th October*, 1844. 12, *Chowringhee.* JOHN OWEN.

With the thanks of the Society to Mr. Owen, a request was ordered to be made to him for some account of the properties of the various articles.

Read the following note from Captain Bogle, Commissioner Arracan, accompanying the specimens to which it refers.

I have the pleasure to send you per "Amherst," for the Asiatic Society, a piece of Teak wood cut in the Forests of Arracan!! also a packet of Hill people's clothes. I regret I have not time to write fully about them to-day, but I will do so by dak in a day or two, mean time this will suffice to let you know that these things are in the "Amherst" for you.

A. BOGLE.

Akyab, 22*d August*, 1844.

Two plaster casts of Fossil Tympani of Whales, taken by the Rev. Professor Henslow from the Suffolk Crag formation at Felixstow, were presented by Captain Kittoe, B. N. I.

The Curator, Geological and Mineralogical department, being only convalescent from a severe illness, had been unable to prepare any report for this month.

For all the above presentations and contributions, the best thanks of the Society were accorded.

Proceedings of the Asiatic Society, for the month of December, 1844.

The monthly Meeting, which had been unavoidably postponed, was held on Tuesday evening, the 17th December, 1844.

The Rev. J. Hæberlin, in the Chair.

The following members proposed at the last meeting were ballotted for and declared duly elected :—

Jas. Alexander, Esq. C. S. Jas. Furlong, Esq. Mulnauth Factory.

And the following gentlemen were proposed as Members :—

F. Boutros, Esq. Principal of the Dehli College, proposed by E. C. Ravenshaw, Esq. C. S., and seconded by W. C. Quintin, Esq. C. S.

A. Christopher, Esq. of LaMartiniere, proposed by Major General Hodgson, and seconded by H. Torrens, Esq.

Lewin Bentham Bowring, Esq. C. S., proposed by Major General Hodgson, and seconded by H. Torrens, Esq.

E. Blyth, Esq. Zoological Curator, Associate Member, proposed by H. Torrens, Esq., and seconded by H. Piddington, Esq.

John Ward, Esq. Messrs. Jessop and Co. Civil Engineer, proposed by Lieut. Col. Forbes, B. E., and seconded by Captain Goodwyn, B. E.

A. W. Steart, Esq. B. M. S.,* proposed by George Hill, Esq., and seconded by H. Torrens, Esq.

Read the following list of books presented and purchased :—

Books received for the Meeting of the Asiatic Society, Tuesday 17th December, 1844.

Books Presented.

1. The Horn Book of Storms for the Indian and China Seas, by H. Piddington, from the author.

2. Notes on the Naga Tribes in Communication with Assam, by John Owen, by the author.

3. Zeitschrift für die Kunde des Morgenlandes, herausgegeben von Christian Lassen. Sechsten Bandes Erstes Heft 1844. By the author.

* *Memorandum.*—In the case of this gentleman who was on the point of embarking for Europe, it was proposed to proceed immediately to ballot but the sense of the Members present, being decidedly against such an innovation on the established rule the proposal fell to the ground.

4. Calcutta Journal of Nat. History by J. McClelland, Bengal Medical Service, 2 Nos. 16 and 18 for January and July 1844, and a Complete set in exchange for the Journal of the Society, from the date of the Commencement of the Journal of Natural History.

5. Journal of the Agricultural and Horticultural Society of India, vol. iii, part ii, by the Society.

6. Calcutta Christian Observer for December 1844, by the Editor.

7. Supplement Calcutta Christian Observer, by the Editor

8. The Oriental Christian Spectator, November 1844, by the Editor.

9. The Palms of British East India, by Dr. Griffith.

10. Proceedings of the Royal Society for

1838	Nos.	31 to 36.
1839	,,	37 to 41.
1840-41	,,	42 to 46.
1842	,,	47 to 55.
1843	,,	57 to 58.

11. Proceedings of the Calcutta School Book Society. Reports 1st to 10th and 12th, by the Rev. Mr. Long.

12. Description of some nondescript insects from Assam, by the author, W. Griffith, Esq. M. M. S. 2 copies.

13. Philosophical Transactions of the Royal Society of London from 1838 to 1843, 6 vols. and part 1 of 1844, by the Society.

14. The Royal Society for November 1841, and November 1843, by the Society.

15. Meteorological Register, kept at the Surveyor General's Office, Calcutta, for October and November 1844.

Books Purchased.

16. Researches into the Physical History of Mankind, by J. C. Prichard, vol. 4.

17. The Annals and Magazine of Natural History, including Zoology, Botany, and Geology, vol. 14, Nos. 90 and 91.

18. Journal Des Savans, August, 1844.

19. The Athenæum for September 14th, 21st and 28th, 1844.

20. The History of Etruria, by Mrs. H. Gray part I.

21. A Manual of Ancient History. Translated from the German of A. H. L. Heeren.

22. Geography of Arabia, by G. Foster, 2 vols.

23. Classical Museum, Nos. 2, 3, 4 and 5.

Read the following letters from the Society's London Agents and booksellers :—

To H. Piddington, *Esq. Secretary of the Asiatic Society Calcutta.*

Sir,—We have the pleasure to acknowledge the receipt of your letter of the 14th July, enclosing a bill of lading for a case of books shipped on board the *Lady Flora Hastings* for the Asiatic Society of Paris. On the arrival of the vessel the case shall be forwarded to to the Society agreeably to your instructions.

London, 10th September, 1844. Wm. H. Allen & Co.

To H. Torrens, *Esq. &c, &c. &c. Secretary to the Asiatic Society of Bengal.*

Sir,—We have the pleasure to advise you of our having forwarded by the ship "Tudor," to your address, care of Messrs. Ostell and Lepage, a case of Books for the Society which has been received from Trinity College, Dublin, with a request that it might be forwarded to the Asiatic Society by an early opportunity. We have no doubt you will have heard from Trinity College, respecting the same ere this.

By the same ship we have likewise forwarded to your address a small box containing shells, &c. which are presented to the Society by Dr. Vandem Busch of Bremen. The Dr. will be much obliged by your acknowledging the same. We have paid fifteen shillings, expences on the box from Bremen, which we shall charge in our account.

Messrs. Ostell and Co. have been requested to deliver the cases to the Society as soon as they reach them.

London, 2d September, 1844.

Wm. H. Allen, and Co.

An application having been made by Mr. H. M. Smith, the artist employed in reducing and lithographing the fine coloured map of the Nerbudda river, which appeared in No. 153 of the Journal, for a small gratuity above his contract, on the ground that the work had been more difficult and costly than he at first expected, and some difference of opinion having arisen in the Committee of Papers, as to the propriety of according this increase, it was referred to the Society, who voted Mr. Smith a gratuity of 25 rupees above the amount of his bill.

Read letter from the Officiating Secretary to the Government of India:—

No. 588.

From T. R. Davidson, *Esq. Officiating Secretary to the Government of India, to* H. Torrens, *Esq. Vice President and Secretary Asiatic Society, dated the 30th November* 1844.

Home Department.

Sir,—I am directed to acknowledge the receipt of your letter of the 11th Instant, with its enclosure, and to communicate the desire of the Right Hon'ble the Governor General in Council, that the Asiatic Society will be good enough to forward to this Department 25 copies of the Memoir* therein referred to.

Fort William, the 30th Nov. 1844.

T. R. Davidson,
Offig. Secy. to the Govt. of India.

From the Secretary of the Military Board:—

No. 3,954.

To H. Torrens, *Esq. Vice-President and Secretary of the Asiatic Society.*

Sir,—I am directed by the Military Board to acknowledge the receipt of your letter dated the 6th current, and to state that application should be addressed to

* On the navigation of the Nerbuddah river with a map, see Journal No. 1833. One hundred copies were also forwarded for the Government of the N. W. P.

Government for Lieut. Yule's papers on the Coal Formations at Cheera Poonjee, as without previous sanction, the Board are not at liberty to grant copies (or originals) of any public documents.

2. The Board desire me to express their thanks for the very polite and liberal offer of the map and memoir of the course of the Nerbudda, by Lieut. Shakespear, and request to be favoured with 6 copies, if so many can be conveniently spared.

Fort William, Military Board Office, 25th October, 1844. J. Green, *Secretary.*

From the Secretary to the Government of North West Provinces:—

No. 901.

From A. Shakespear, *Esq. Asst. Secy. to the Government N. W. P. Agra, to* H. Torrens, *Esq. Secy. Asiatic Society Calcutta, dated Agra, the 2d Oct.* 1844.

Genl. Depart. N. W. P.

Sir,—I am directed to acknowledge the receipt of your letter of the 10th ultimo, and to state that His Honor will be glad to receive 100 spare copies of the Note on the Nerbuddah, and of the map of that river at the cost price.*

Agra, the 2d Oct. 1844. A. Shakespear.
Asst. Secy. to the Govt. N. W. P.

No. 1031.

From A. Shakespear, *Esq. Asst. Secy. to Govt. N. W. P., to the Secy. Asiatic Society, Calcutta, dated the 5th Nov.* 1844.

Genl. Depart.

Sir,—I am desired to place at the disposal of the Asiatic Society for publication in their Journal, the accompanying "Notes on the subject of the Kamaon, and Rohilcund Turaee," compiled by J. H. Batten, Esq. Senior Assistant Commissioner, Kamaon proper.

Agra, the 5th Nov. 1844. A. Shakespear,
Asst. Secy. to Govt. N. W. P.

From the Secretary to the Government of India:—

No. 792, of 1844.

From F. Currie, *Esq. Secy. to the Govt. of India, to the Secy. to the Asiatic Society, dated Fort William, the 9th Nov.* 1844.

Foreign Depart Secret.

Sir,—By direction of the Governor General in Council, I have the honor to transmit to you for such notice as the Society may deem them to merit, the accompanying papers received from Major R. Leech, C. B. containing information of certain countries little known to Europeans, lying beyond the Indus and Cabool rivers.

2. You will be pleased to return the original papers when no longer required.

Fort William, the 9th Nov. 1844. F. Currie,
Secy. to the Govt. of India.

* No charge is made by the Society for these returns for the courtesy of Government, the Society considering it as one of its first duties to aid as much as possible in all matters connected with the public service or the diffusion of knowledge.—Eds.

No. 802 of 1844.

From F. Currie, *Esq. Secy. to the Govt. of India, to* H. Torrens, *Esq. Secy. to the Asiatic Society, dated Fort William, the* 16*th Nov.* 1844.

Foreign Depart. Secret.

Sir,—I am directed by the Governor General in Council to transmit to you, for such notice as the Society may deem them to merit, the accompanying papers received from Major R. Leech, C. B. containing information regarding the Hazarehs and the early Ghilzaees.

2. You will be pleased to return the original documents for Record in this office when no longer required.

Fort William, the 19*th Nov.* 1844.

F. Currie,
Secy. to the Govt. of India.

From the Under-Secretary to the Government of India:—

No. 805, of 1844.

From W. Edwards, *Esq. under Secy. to the Govt. of India, to* H. Torrens, *Esq. Secy. to the Asiatic Society, dated Fort William, the* 16*th Nov.* 1844.

Foreign Depart Secret.

Sir,—I am directed by the Right Hon'ble the Governor General in Council, to transmit to you, for such notice as the Asiatic Society, may deem them to merit, the accompanying papers received from Major R. Leech, C. B. containing an account of the early Abdhalees, and notes on the religion of the Sikhs.

2. You will be pleased to return these documents for record in this office when no longer required.

Fort William, the 16*th Nov.* 1844.

W. Edwards,
Under Secy. to the Govt. of India.

The papers received from Government with the foregoing communications were referred to the Editors of the Journal for publication or extracts.

Read the following memorandum by the Sub-Secretary:—

Memorandum.

In a letter to the Sub-secretary of August last, the Right Hon'ble Sir Edward Ryan says,

"The picture for the Asiatic Society is, as far as I am concerned, finished, the artist is Mr. Laurence. It might be completed, and dispatched in January next, (until then, there will be no good ship, and the season is unfavourable,) but the artist may try to keep it for the exhibition which I shall endeavour to prevent. The picture for the Asiatic Society has been seen by by Mr. Thoby and Mr. William Prinsep.

I am happy to tell you that Mr. Lay, has nearly finished an admirable likeness of Mr. Thoby Prinsep, for the Asiatic Society.

A complete copy of Abdul Ruzzack's Dictionary of the Technical terms of the Sufis, edited in the original Arabic by A. Sprenger, Esq. M. D. B. M. S., and printed at the expense of the Society, was on the table as a work finished and to be published in a few days.

The following extract of a letter from Dr. Sprenger, relative to it was read :—

I put " to be sold by Allen and Co." in the title page, I wish that arrangements might be made to have the Society's books sold at all these places, (particularly by Brockhaus who besides Germany, provides Russia and Italy with books,) in order to make them known and more generally useful, I know all the parties personally, and if you like I will be your *chargé d'affairs* in concluding treaties of commerce with them.

A. Sprenger.

Chinsurah, November 30th 1844.

Read the following note from the Secretary : and it was referred to the Committee of Papers to recommend the number of copies, for which the Society should subscribe :—

Dr. Hœberlin announced, through the Secretary, his intention of publishing a Sanscrit Anthology consisting of fifty brief, but choice specimens of the best school, that of Kali Dasa, of Sanscrit poetry, didactic, elegiac, and other. This offers to the Sanscrit scholar a description of work as yet a desideratum in the learned world, a book namely which may enable him to study in brief, and at small cost, the best, and choicest classical styles of eminent writers in that ancient and admirable language. Dr. Hœberlin proposes to publish the work himself, but in communication with him, the Secretary suggested to the Society their taking a certain number of copies of it. It will prove a most valuable book to the Society for the purpose of distribution to learned bodies, and individual scholars in correspondence with it. The copies will be delivered at trade price. He stated that he was not prepared to note at present the number of copies to be taken, but after making a list of quarters in which they might be distributed, and a reasonable stock of reserve copies, the Secretary said he would have the honour of laying that list, definitely numeralised, before the Society if the general proposition be favourably received.

Read the following letter from the Zoological Curator :—

To the Secretary of the Asiatic Society.

Sir,—I wish to call your attention to the necessity that exists for some further assistance in my department of the museum. It is to no purpose that I devote more than double the number of hours to the business of my office, than were stipulated at the time I took charge of the Museum ; and that I devote my *undivided attention* to those duties, without receiving any additional remuneration for thus labouring so many extra hours daily. In consequence chiefly of those exertions, the labour in my particular department has increased to that degree, that it is impossible for any one person, or even for two or three, to get properly through it. What with corresponding, the necessity of attending visitors who manifest an interest in the Museum,

and a variety of current business of daily urgency, I find it impossible to make that progress, which I wish and desire, not only in the preparation of the letterpress to accompany the publication of Burnes' drawings, but in various other matters which it is desirable should meet with every attention. There is, indeed, abundant occupation for one naturalist in the entomological department, whether or not comprising the whole of the annulose animals; and there is equal occupation for another in the investigation of Indian mollusca and other *Invertebrata* exclusive of the annulose animals. But, for the present, a good deal of assistance might be rendered to me by the appointment of a youth, whom I have for some time past employed in writing labels, and doing other work of the kind, and who might be engaged as a general assistant to me for a salary of 10 or 12 rupees a month to begin with, promising an advance in case of his affording satisfaction after a sufficient trial. It is quite necessary also that some addition should be made to the number of servants in my department. At present there is only one old man, who is quite superannuated, and I am constantly obliged to employ my own private servants in the Society's business. There is full employment for two additional servants, one as a messenger, and the other to assist in cleaning the specimens, glasses, &c.: the fact being, that the place of one who left some six months ago has never been filled up, his work having been since performed chiefly by lads who are now distributed over the country in the capacity of taxidermists, assisting different gentlemen who are active contributors to the Society's museum. Leaving these matters to your consideration,

I beg to remain, Sir,
Yours very respectfully,
E. Blyth.

17th December, 1844.

Referred for discretional intercourse with the Secretary.

Read the following references to and from the Committee of Papers, and papers connected with them, on the subject of Major Jervis' proposal to execute glypographs and lithographs for the Society:—

I have to circulate the extract accompanying.*

For my own part I think it in some sort our duty to patronise, and encourage local artists rather than go to England for our illustrations. If the Society are satisfied with what has been done hitherto, I may perhaps be directed to write to Major Jervis accordingly.

H. Torrens,
V. P. &c. &c.

December, 6th, 1844.

Memorandum by the Sub-secretary.

My Dear Torrens,—Looking at your note for the circulation of Major Jervis' letter and specimens of Lithography, the following views occur to me which the Committee should also I think bear in mind.

* See Proceedings of November.

1. The great merit of every pictorial work is, that it be either a faithful representation, or a faithful *copy* of the original representation when it is to be multiplied by the press: for from the moment that an artist is permitted to *improve* a drawing or a sketch, unless he does so under the eye of the person who first made it, the chances are a hundred to one that what it gains as a picture it loses as an honest copy of what was done on the spot. Major Jervis' lithograph of the Argemone Mexicana seems to have been subjected to *improvement.* It is too elegant for our common *Shial Kanta.* We know that this has been carried to such a length in Europe that naturalists are now much occupied in divesting publisher's *pictures* of their artistical improvements, by referring back to the original drawings, however faulty these may be in many points.

2. We have rarely, if ever *first rate* sketches or drawings in India, though we often have them good, and spirited, and conveying a vivid idea of the place, plant or animal, &c. and we have sometimes the advantage of having the naturalist on the spot to correct his own work* or shew the artist how far he may do it for him. By sending to Europe we at once lose this important advantage.

3. If we had always *first rate* drawings we might perhaps with truth say we could not do justice to them. But I submit that, hitherto, we have most certainly given *most accurate copies of what we had to copy from?* and that the question is really, situated as the Society is, not if we can give first rate work, but if we can give five hundred *exact copies* of the works put into our hands: I do not allude here of course to the cheapness or dearness, distance, loss of time, risks of loss, (or must we keep duplicates ?) &c. &c. &.

4. Again. The Society is always *in trust* for these matters. Are we justified, I should ask, in trusting out of our safe custody the labours of others ? And this in the face of the many reports which we hear of the eager rivalities of European naturalists ? How *could* the Society for instance send Dr. Cantor's Chusan drawings or those of Burnes, &c. to Europe ?

5. As far as I am concerned it would be a great load of work taken off my file, for you know what artists, and printers, and authors here are ; so that I am really interested that all the work *should* be sent to England !

6. I venture then to request of you, for I think it will assist the Committee in forming their judgment, to circulate with Major Jervis' proposal, the following copies with originals, which are in various styles, and which have not yet been seen together by the Committee.

The Burnes' drawings have already been exhibited, and as coloured lithographs have been pronounced most creditable work, and most faithful copies.

European Artist, Mr. Bennet, { 1. Dr. Griffith's Botanical plates to Cantor's Chusan Zoology, 4 drawings.
2. Plate I of Dr. Cantor's Chusan Zoology, Vespertilo *irretitus.*

Native Artist, .. 3. Lt. Yule's two Kasia Hill drawings.

European Artist, Mr. Bennet, .. { 4. A jaw and teeth from Dr. Spilsbury's Fossils.

Native Artist, .. 5. Siamese Emperor, Col. Lowe, 2 drawings.

7th December, 1844.

H. PIDDINGTON,
Sub-Secretary, &c.

* As in the case of Dr. Griffith with his Botanical Plates to Cantor's Chusan Zoology. See subsequently his letter.

The accompanying papers with a memorandum from the Secretary are re-circulated by his desire, and the specimens of our work as ready for the Journal and Researches.

H. Piddington,
Sub-Secretary Asiatic Society.

Thursday Noon.

I beg to re-circulate these papers.

It is easy to advocate the acceptance of Major Jervis's offer, but not so facile to explain to the Editor of a monthly Journal how he is to satisfy his contributors by speedy publication of their illustrated papers, as well as to insure them against risk of loss of their original drawings when the publication of their articles, and the very conservation of their originals, is contingent upon the hazards of a transmission to England to a third party?

To put the matter as fully as possible before the Committee, I circulate the specimens or proof lithographs of drawings now on hand for publication in the Journal and the Researches, with their originals. The botanical lithographs are to illustrate Dr. Griffith's paper for Cantor's Chusan.

I submit that these local productions are rather above the average of such work for scientific periodicals, and although inferior to Major Jervis', yet respectable and even creditable to the Journal, and not unworthy the Researches.

I trust the Committee will not make the difficult task of editing a scientific Journal in India, next to impossible, by requiring illustrations of papers published monthly to be prepared in a country whence, at the shortest, I could not get them under five months.

The preparation of plates for the Researches by Major Jervis is I think most expedient.

H. Torrens,
V. P. and Secretary Asiatic Society.

Additional Memorandum by the Sub-Secretary.

Between the first and second circulation of the papers relative to Major Jervis' proposal, thinking that the opinion of a scientific man, himself an artist, of experience in Indian scientific publications, and well acquainted with the business details as well as the tricks which are, it is said, sometimes practised in these matters, would be useful, I wrote to Dr. Griffith, then on his way down the river, on the subject. I unfortunately did not keep a copy of my letter, but I was very careful not to say any thing which could bias him either way; stating only that as it had been proposed, and was now under consideration, to send drawings home for lithographing for the Society's publications I should be glad to have his opinion of this proposal as regarded the interests of men of science, the risks of the drawings, copying here, &c. &c. and the style of execution of Calcutta artists; his answer is as follows:—

My dear Sir,—I think the state of copying drawings in Calcutta, promising enough to entitle Calcutta artists to patronage; two or three more attempts, and their copies would be equal to most of the drawings in ordinary periodicals, and at any rate be quite equal to properly illustrating the subjects.

Scientific drawings require scientific superintendence even in England, and to have one's drawings copied away from one would be nearly as bad as having one's MS, printed while one is absent. No. 1. of mine is very fair; the faults of the others are faults of the drawings which were not bold enough. This arose from inexperience on my part; I am quite certain that very creditable drawings can be made in Calcutta. with ordinary care on the part of authors and proper supervision of the artists. Therefore I would not send drawings home, myself unless a very high degree of finish was required.

Your's

Kedgeree, 15th December, 1844. (Signed) W. Griffith.

After some discussion it was resolved:—

That as an experimental measure plates for the Researches be generally referred to Major Jervis, and those for the Journal be generally executed here.

It was mentioned that Mr. Heatly had addressed a letter to the Secretary embodying some remarks on the want of connection between Home and Indian Scientific Societies, and submitting some views as to a remodelling of the present working system of the Society, but no definite proposal being brought forward, discussion was for the present necessarily postponed.

Report of the Curator Geological and Mineralogical Departments and of the Museum of Economic Geology, for the month of October.

Geological and Mineralogical.—We have this month to announce the highly interesting discovery by our zealous member and contributor Captain Newbold, of Bone caves in Southern India, and I cannot better do so than in the words of his letter.

Captain Newbold writes from Kurnool as follows:—

"Enclosed is a brief note of some of my late labours, pray correct any thing wrong I really have hardly time to write.

If similar cave deposits have hitherto been not discovered in your part of India, kindly notice the fact in an Editorial note. These are the first fruits from Southern India, Have you got hold of Voysey's unpublished notes and map? if so, please let us in South India who are much interested, have the benefit by an early publication."

His description of the Bone Caves will appropriately form an article for the Journal.

Dr. Rowe of the Artillery at Dum-Dum, it will be recollected, referred to the Museum for the identification of a few specimens of minerals which he had collected on the old Benares road on a march down.

In replying to him I requested specimens of the Corundums for the Museum, and some account of the locality if he could oblige us with one. He has been good enough to place at our disposal a very carefully kept itinerary of that road, which affords so many

useful hints to the Geologist and Mineralogist, that I should strongly recommend its publication. Though Dr. Rowe modestly disclaims any scientific merit in it, yet it evidently is the production of a gentleman who knew what he saw, and made the best use of the brief moments a military march allows to a medical man. It were much to be wished we had many such observers and tracks, for they would give us, if not correct sections, much useful Geological information, particularly if specimens of the rocks were collected and the inclination of the strata seen were noted.

I have completed the catalogue of Mr. Dodd's specimens which form a very handsome and instructive case in our Geological collection. The catalogue should be printed as the best means of preserving a record of it: and of the Society's property.

Dr. Spilsbury has sent us some more specimens of his sandstones with arborescent impressions, some of which are not superficial but go *through* the slab; and he inclines to think they may be fuci. I have tried both with the blowpipe, and the superficial ones are oxide of manganese; those penetrating these specimens are iron, and if they ever were organic there are now no traces of organic matter remaining; but in discussing this curious question, as far as I recollect, it seems to have been forgotten that it is not impossible the iron and manganese may yet be the remains of organic bodies, as for example the deep-sea fuci, of which we know nothing.

Mr. Dodd of the mint, on his departure for the Cape, has favoured us with a few specimens of sandstone and limestone from the Bhurtpore and Kerowlee Territory, of which his letter speaks as follows:—

I send you a few more specimens of sandstone from the Bhurtpore Territory.

A few specimens of limestone from the Kerowlee Territory, (the country where this limestone is found abounds with caverns and waterfalls, and I imagine it belongs to the Magnesian limestone formation) from Kerowlee, a fragment of coal was brought me when at Agra. There are also a few specimens of sandstone with ripple marks on them, also a few specimens of red sandstone, with what I imagine to be encrinital marks in them.

I thought these might be interesting as connected with some paper in the Asiatic Society's Journal.

5th November, 1844. Jas. Dodd.

P. S.—You will find some of the sandstone specimens contain casts of shells.

I have not had time to examine the shells of which he speaks. The mottled impressions on the sandstone are certainly not encrinital as far as I can perceive, and are, I think much more probably, as in other cases in Europe, and as suggested by a writer in the Annals and Magazine of Natural History, the result of some animal or vegetable substance discolouring the red iron tint of the original sand. Dr. Voysey *As. Res.* Vol. XV. p. 429, says of the Agra mottled sandstones that the spots are really spherical, and these appear also to be so in some places.

Museum of Economic Geology.—I may mention here that I sent some of our Museum circulars to my brother, who is much connected with Civil Engineers. He writes to me "My friend Sopwith writes to you by the 15th September mail. We are having 250 copies of your circular printed for distribution, Mr. Sopwith says he is sure Sir H. Dela Beche, takes the greatest interest in the success of the Asiatic Society and Indian Museum, and has shewn him your report, but Sir H. De la

Beche really is overwhelmed with work which he is sure is the only reason why you have not heard from him."

Lt. Chamier of the Ordnance Department, sent us some time ago some clippings of the Cabul Trophy gun at Agra for examination, mentioning that the native belief was that these guns contained considerable proportions of the precious metals. The Sp. gravity was however, found to be only 8.35, that of good gun metal being about 8.40,* and it was found to be a bad compound of impure (sulphuret of) copper with small proportions of tin, lead, zinc and traces of iron; and certainly containing no trace of gold or silver. As the yellow sulphuret of copper imitates gold in colour, and any white metal might be made to pass for silver, it is probable the native princes and their officers, if they *do* give any gold or silver for the gun, which they might easily be persuaded to do, are thus tricked by the founders. The frauds of goldsmiths and copper founders (*Sonars* and *Khansaries*) are pretty nearly proverbial in India, as witness the well known tale of the goldsmith and the Raja's idol.

Our active contributor Lt. Sherwill, of the Revenue Survey has sent us a highly valuable series of specimens comprising coal from the Rajarrah coal mines in Behar, and the various measures (Strata) which are passed through before it is found; his list is as follows:—

Specimens.

No. 1.—Black stone, found in four separate strata before reaching the 11 feet stratum.

No. 2.—Shale from the 11 feet stratum.

No. 3.—Stone from above or forming the roof of the 11 feet stratum.

No. 4.—Stone found in large masses in the 11 feet stratum.

No. 5.—A piece of coal from the 11 feet stratum covered with pyrites.

No. 6.—A piece of the coal from the 11 feet stratum.

No. 7.—Coarse sandstone, from above the bad coal of an experimental and forsaken pit, this stone is found about 40 feet below the surface of the soil.

No. 8.—Lying under No. 7.

No. 9.—Lying under No. 9.

This pit was forsaken not offering any coal worth quarrying, depth about 75 feet.

Vertical section of the strata in the shafts at Rajharrah Colliery:—

* The composition of the statue of Louis xv. was copper 82.45, zinc 10.30, tin 4.10, lead 3.15. It sp. grav. 8.482, good cannon metal should contain 90 or 91 of copper, and 9 or 10 per cent. of tin; and as much as 14 per cent. of tin has been used. *Ure's Dictionary.*

	Feet.	Inches.
Loam, ...	17	6
White sand stone, ...	3	0
Coal,..	1	6
Bad coal, ...	3	0
Black stone,....	3	0
Coal, ...	3	0
Black stone, ...	4	0
Coal, ...	2	3
Black stone, ...	2	0
Coal, ...	1	0
Black stone, ...	7	0
Coal, ...	11	0
	58	3 South Pit.

Underneath Black stone or slate,....Unknown depth.

H. S. Sherwill.

Mr. Martin of Gowhattee, Assam, has again contributed (to our general museum)* by an assortment of woods from that country 16 in number, completing with the former one of 9 sorts† 24 specimens in all.

No. 254.

To H. Piddington, *Esq. Curator Museum of Economic Geology.*

Sir,—I have the pleasure to advise you of the despatch to the care of my agents Messrs. T. H. Gardiner, and Co. of sixteen specimens of Assam woods numbered from IX to XIV, a list of which is annexed.

I have the honor to be, Sir,

Gowahattee, 4th Oct. 1844. Your most obedient servant,

W. N. Martin,

Ex. Off. Lower Assam.

List being a continuation of Assam woods,

IX—Red Pine.
X—Bar Paroolee.
XI—Hooroo Kootolah.
XII—Sisso.
XIII—Amaree.
XIV—Khootee Kurooee.
XV—Gondhoree.
XVI—Kootulnah.
XVII—Bon Som.
XVIII—Ahohee Parolee.
XIX—Bur Karooee.
XX—Podocarpus.
XXI—Coniaree.
XXII—Phool Sapa.
XXIII—Hatee Karuhal.
XXIV—Toko Palom.

W. N. Martin,

Ex. Off. Lower Assam.

* But as addressed to me I acknowledge it here. † Proceedings of May, 1844.

From Messrs. Gillanders and Co. I have obtained a cake of artificial fuel, which is the object of a patent at home ; and, as shewing how coal may be œconomised is always a proper addition to our Museum. I do not know the composition of this particular fuel which, however, is probably coal dust and some of the bitumens; but I may mention that some years ago I ascertained that coal dust mixed in as large a quantity as would hold together with cow dung and a little earth, (the native composition for smearing floors, &c.) forms a capital fuel, where a slow steady fire, as in distilling or sugar drying house work, is required, and I made and burnt several hundred maunds of it. I made a communication to Government (Lord Auckland's) on the subject but never heard any thing in reply.

For all presentations and communications the thanks of the Society were voted.

JOURNAL

OF THE

ASIATIC SOCIETY.

On the Migratory Tribes of Natives in Central India. By Edward Balfour, Esq., *Assistant Surgeon. Communicated by the Author to* Jameson's Edinburgh Journal.

We have copied the following interesting article from Jameson's Edinburgh Journal, No. LXIX, for 1843, and we add to it from Dr. Voysey's Journals, his brief Vocabulary of the Goand and Cole words. We cannot on this occasion refrain from again urging upon gentlemen who may be so situated as to be able to obtain these notices and vocabularies, the extreme importance and great utility of doing so. It is impossible, we think, for the oldest resident in India to read this curious article without being struck with the reflection of how much there is in India, of which we as yet know little or nothing, and yet the knowledge of which is so important to us in every capacity. We trust that Dr. Balfour's praiseworthy labours will not stop here, and that he will go on in the useful and honorable field in which he has chosen to labour.—Eds.

The hills and forests in the centre of India, are inhabited by people differing widely from the inhabitants of the plains. Their great abode, says Mr. Elphinstone, is the Vindya mountains, which run east and west from the Ganges to Guzerat, and the broad tract of forest which extends north and south from the neighbourhood of Allahabad to the latitude of Masulipatam, and with interruptions almost to Cape Comorin. These people have separate names—Paharias, Kols, Gonds, Bheels, Colis, and Colaris; but in many points they differ from each other, and little has been done to shew that they are the same people. In addition to these races, there are many smaller communities spread throughout India, each with a distinct name, and speaking a distinct tongue; leading a migratory life, and resorting only to towns to purchase a few necessaries; they seem the remains of some aboriginal peo-

ple who had occupied the soil perhaps before any of the nations now possessing it; and it may not be uninteresting to mention some of the habits of these nomade races.

THE GOHUR, CALLED BY EUROPEANS AND NATIVES BENJARI, OR LUMBARI.

The Binjarries are separated among themselves into three tribes—Chouhone, Rhatore, and Powar. Their original country, they say, was Rajputana,* but they now are spread over Hindostan, all adhering to the same customs, and speaking the same language This bears a strong resemblance to the language of Guzerat, though there are many words in it without affinity with any of the dialects we are acquainted with. At the head of the Binjarries in the Dekhan are two individuals who receive the title of Naeks. They reside in Hyderabad, and the encampments located near that city refer any disputes that arise to them for their decision ; but the chief occupation of these Naeks is to keep up a correspondence with the different parts of the country, to gain early information from localities where war or famine has raised the price of grain.

The Binjarries are grain merchants; indeed the name is given them from their occupation ; and their traffic being carried on by bullocks, they traverse the most impracticable countries to collect supplies, which they pour into the districts where scarcity prevails, or they move in the track of large armies, to furnish them with grain during the campaign. In carrying on war in India, where armies carry their magazines along with them, the services of the Binjarries are almost indispensable, and their occupation renders them sacred. For this reason, though moving among hostile bodies in time of war, they consider themselves secure from being molested by any party, and there have been instances of large bodies passing near camps, and though refusing to dispose of the grain they carried, being allowed to move on to the enemy, the dread of alarming them, and thus banishing them for ever, being sufficient to protect them from interruption. The time of hostilities or of dearth was a period of activity among them ; but

* On the summits of the hills (formerly islets) which, united, form the island of Bombay, reside about 75 families of cultivators, who say they emigrated from Rajputanah. Many of the words in the language of this people, and the dress of their women, are similiar to the Gohurs. They call themselves Purmans.

our successes have restored order to India, and have sent our troops to cantonments, and with the return of peace, nothing occurs to interrupt the labours of the husbandman, and scarcity seldom prevails. These changes have done much to make the Binjarries poor, and where disease has swept away their bullocks, the community, unable to purchase others, has broken up and dispersed. When thus reduced, the women bring firewood to the towns to sell, which their husbands cut in the jungles. They were at all times considered a bold and formidable race, and when traversing the country with herds of bullocks transporting grain and salt, they frequently perpetrated robberies in gangs, and they are not over-scrupulous in committing murder on these occasions, if they meet with opposition, or deem it necessary for their security. With the approaches of poverty, too, vice has grown apace; many are convicted of stealing cattle and children, and Thugs have also been detected among them.

A community of Binjarries is termed a Tanda. In each Tanda an individual is selected to whom the title of Naek is given, but his rank would seem to clothe him with but little authority. No rules exist among them to regulate their conduct or guide their society, and though they keep together in large bodies, it would seem more from their intermarriages and the security numbers give, than from any laws binding them to the tribe. The Tandas in their movements encamp on wastes and uncultivated spots, sometimes near, but more frequently remote, from towns.

The Binjarries pull down the wild boar with dogs of a powerful and peculiar breed, which they keep in all their Tandas; but with the exception of the wild hog, they live, as regards food, like other Hindus. A few are met with who can read and write. Their wandering life precludes them from residing in towns; they live under tents while the hot weather continues, and on the approach of the monsoon, construct grass huts to shelter them from the piercing rains that fall.

Their features are dark and bronzed. The men have tall and muscular frames. Their dress differing much from the nations and communities around them, attracts attention to the females of the tribe, on whom nature has bestowed the most faultless forms; tall and exquisitely moulded, these dark children of the desert move with a grace unwitnessed among a civilized people, their loose and peculiarly form-

ed garments assisting to set off their shape. A boddice (called Kanterie) fitting neatly to the form in front, reaches from the neck to the hip, conceals the bosom, but is left open behind; this with a gown (petia) fastened by a noose beneath the waist, and falling in loose folds to the feet, and scarf (cadhi) thrown carelessly over the shoulder, completes their dress, which is made of cloth dyed with bright and varied colours. From their hair, and the tapes that bind their dress, are suspended long strings of courie shells, massive rings of silver clasp the ankles, and the arms, from the wrist to the shoulder, are loaded with broad rings of ivory, cut from the elephants' tusks, and dyed with varied dyes. The ceremonies attending the marriage of a widow are, as is usual among the natives of the east, few; the gift of a new cloth, and the selection of a fortunate hour on which to conduct the bride home, comprise the whole. With the young bride, a more lengthened rejoicing is made. On the marriage being assented to, the bridegroom pays one or two hundred rupees to the parents of the bride, and at the early part of the day, which the brahman who has been consulted has pronounced auspicious, two pyramids are constructed, by placing earthen pots one above another, ten or twelve feet apart, a bundle of firewood is laid behind each pyramid, and two wooden pestles, used by the women of every house in India to clean the grain, are planted perpendicularly between. The ceremonies last five days, during which the friends are feasted, the bride and bridegroom sitting on the ground between the pyramids, and on the fifth day, after being bathed by their respective male and female relations, the bridegroom leads to his tent his bride. The next morning the young wife rises early, and carrying the hand-mill near the feet of her husband's parents, there grinds the corn* necessary for the meals of the

* Shortly after midnight, the women in the east rise and begin to grind corn for the family, cheering themselves in their lonely task by singing their labour songs. In several parts of Scripture this custom of grinding the corn for the day's consumption is noticed. "In the day when the grinders cease because they are few, and the doors be shut in the streets because the sound of the grinding is low."—Ecc. xii. 3, 4. See also Ex. xi. 5. and Is. xlvii. 1, where it says, "Come down and sit in the dust, O virgin daughter of Babylon; sit on the ground; there is no throne, O daughter of the Chaldeans, take the millstones and grind meal;" and in Matt, xxiv. 41, it is said, "two women shall be grinding at the mill, the one shall be taken and the other left." One person can generally grind sufficient for the use of a small family, but where much is required, two women, as noticed in the Scripture, sit on the ground with the millstones between them.

coming day, and is thus initiated into the practice of her domestic duties. The Binjarries are not restricted to one wife. It is rare, however, to have more than three or four in a house.

In the roving life they lead, exposed to the vicissitudes of a tropical climate, and liable to accidents and disease, we would fancy that necessity would have taught them some acquaintance with simples and the arts of life; but that custom, fatal to improvement, which obtains throughout India, binding each community to follow only those pursuits which their predecessors have been engaged in, prevails with equal effect among this migratory tribe, to whom every art is equally unknown. When sickness occurs, they lead the sick man to the feet of the bullock called "Hatadia," for, though they say they pay reverence to images, and that their religion is that of the Sikhs, followers of Nana Govind, the object of their worship is this "Hatadia," a bullock devoted to the god Balajee. On this animal no burden is ever laid; but decorated with streamers of red dyed silk and tinkling bells, with many brass chains and rings on neck and feet, and strings of cowrie-shells and silken tassels, hanging in all directions, he moves steadily on at the head of the convoy, and the place he lies down on when tired, that they make their halting ground for the day; at his feet they make their vows when difficulties overtake them, and in illness, whether of themselves or cattle, they trust to his worship for a cure. This bullock is their god, their guide, and their physician.

From their migratory life, we are deprived of all means of calculating their numbers; but spread throughout the whole of India, in large bodies, they no doubt far exceed any amount of people which are brought to one individual's notice.

They bury the people who die unmarried, but the bodies of the married are burned. Food is placed at the head and foot of the grave, but no omen of the state of the deceased is drawn from the creature that eats it.

HIRN-SHIKARRY OR HIRN-PARDY,—THE HUNTERS.

The Hirn-shikarry or Hirn-pardy, the Indian hunters, term themselves Bhourie. They are of short stature, greatly wanting in intelligence, and timid in their intercourse with their fellow-men; while constant exposure to the vicissitudes of the seasons and their familiarity

with toil and want, has stunted their growth and made them black and shrivelled in their form. Their numbers are great. They range from the snowy Himalayahs in the north through the vast plains of Hindustan, till at Cape Comorin, beneath the equator, the Indian ocean checks their further progress.* From each valley and each forest that civilized man has as yet left unoccupied, or has once again abandoned to the wild creatures of nature, the hunter obtains his means of subsistence. The creatures that they kill they eat, for, with the exception of the cow and bullock, all animals, the elephant, the tiger, and the leopard, the jungle dog and jungle cat, the wild-boar, the wolf, the iguana, and the rat and mouse, are used as food by the Bhourie. They obtain a little money by disposing of the skins of the animals they destroy, and often earn large rewards for destroying the leopards and wolves that at all times prowl about the outskirts of villages. The women, on visiting a town, gain a little money by disposing of charms and antidotes to the bite of a snake or scorpion's sting.

The langauge of the Bhourie seems to have little relation to that of any of the other migratory nations. It has many words like the Guzerattee and Mahrattee, and several of pure Sanscrit. The Bhourie are divided into five tribes, receiving among themselves the names, 1. Rhatore or Mewara; 2. Chowhone; 3. Sawundia; 4. Korbiar; and 5. Kodiara. It would appear that the hunters dwell in distinct localities, restrained from migrating to the hunting-grounds of other branches by custom and the fear of punishment, instances having lately occurred where the magistrate's authority has been called in to drive back tribes, who, urged by want, or enticed by more promising wilds, had quitted their own, and located themselves on the hunting grounds of a neighbouring community.

These communities are governed by chiefs, termed "Howlia," who attain to their office by descent. It was difficult to obtain exact information regarding these head men; they would seem to be considered spiritual as well as civil guides, and among the wild untutored minds of these rude creatures, there seemed to be some vague idea that

* Lieut De Butts, in his Rambles in Ceylon, describes a race termed "Veddahs" who, from his description, seem to be the same as the Bhouries of India.

their Howlia is an incarnation of the deity. The occurrence of murder or other grave crime my informant had never heard of; but all minor matters are decided by these chiefs. On them likewise devolves the duty of summoning the different members of the tribe to aid in snaring the tiger, for which villagers and proprietors occasionally offer high rewards. This, when earned, they divide into three shares, one for the god of the river, one for the god of the wilds, the remaining third being apportioned equally among those who were present at the capture, the Howlia or chief obtaining no greater sum than another of the community. They all assemble at the Holi festival, at the place of the Houlia's residence, when he collects his income, the community subscribing one rupee a head.

Among other modes of obtaining subsistence, thieving is one which they look to as no small means of support. Gang robbery, or any system attended with violence, they are not addicted to; but no field or stack of grain is safe from their depredations when they are in the neighbourhood. For this, severe fines, and death itself, were often inflicted on them, while the country was ruled by the native princes; for though the hunters have only a narrow loin-cloth as clothing, and the persons of the women are scarcely hidden by the few rags they pick up in the fields and sew together, yet, when in the grasp of native chiefs, the fear of death has made them produce two to five thousand rupees to purchase forgiveness and regain their freedom. It may be from the recollection of such scenes, that, notwithstanding their seeming poverty, all classes assert these wretched-looking beings to be the possessors of vast wealth, and when in the fields in their lonely camps, sheltered by a few tattered rags stretched overhead, they are at intervals plundered by the ruthless robbers we term decoits.

For the first five years after the beard first appears, it and the hair is cut once a year, but ever after they wear both unshorn, and their long shaggy locks add to their uncouth appearance. The bodies of the dead are buried. Few attain sixty years of age, and ten is the greatest number of children they have known one woman to bear; nor have they ever heard of any one being killed by a tiger, though one of them has assisted at the capture of eight of these creatures. They call themselves a branch of the Dhoongur, the Shepherd or Vesya race.

THE TAREMOOK, OR WANDERING BLACKSMITH.

The Wandering Blacksmith is known in the Dekhani language, as Ghissaris; as Lohars by the Mahrattas; and from the Canarese they receive the name of Bail-Kumbar, but they term themselves Taremook.

Their traditions affirm the northern provinces of Hindustan to have been their original country; but the cause or the period of their emigrating thence has not been preserved. As a race, they are dark, though not black, and somewhat taller than Hindoos in general. They are to be seen dwelling on the outskirts of almost every village throughout India, though their numbers are not great; the largest number of families the old Taremook who gives me this information has ever seen in one place, amounting to ten, a community of perhaps sixty people. It is rare to find them occupying houses in towns; but, for the greater facility of migrating, they encamp outside the walls, where they reside, exposed to the changes of the weather, from which they are barely sheltered; a ragged and patched cloth, two or three yards long, being all a family have for their protection. They are blacksmiths by trade, and are very poor, living from hand to mouth. The women collect wood in the jungles, to make the charcoal necessary in their husbands' trade: the movement of the forge-bellows is likewise the duty of the women, many of whom assist their husbands by working the sledge-hammer. Their language they term Taremooki: that spoken by the communities in the Dekhan contains several Mahrattee and Canaree words, a mixture probably resulting from their lengthened sojourn on the border countries of these two nations.

The richest Taremook my informant has ever seen, was said to be worth ten thousand rupees; but though some individuals collect a little money, he has never known any one learn to read or write. The dress of this migratory race is like that of other Hindus. Their religion is the Brahminical, Kandoba being the deity to which their worship is chiefly directed. Their marriages are conducted similarly to the customs of the Hindoos, but intoxicating drinks are largely used. They have earned a great name for gallantry, and it is a very usual thing to hear of the rough Taremook levanting with another man's wife. On the occasion of a birth, they sacrifice in the name of Satwai. They burn the bodies of married people, and lay the ashes by a river's

side; but the unmarried dead are buried, and for three days after the funeral food is carried to the grave, though they draw no augury of the state of the soul of the deceased from any creature eating the food.

THE KORAWA.

This migratory people arrange themselves into four divisions, the Bajantri, Teling, Kolla, and Soli Korawas, speaking the same language, but none of them intermarrying or eating with each other. Whence they originally migrated it would be difficult perhaps now to come to a conclusion, nor could it be correctly ascertained how far they extend. The Bajantri or Gaon ka Korawa, the musical or village Korawa, are met with in Bejapore, Bellary, Hyderabad, and throughout Canara. The men of this people are somewhat more robustly formed than the settled population; but the females are less tall, and more dark than the Canarese women among whom they are located. Their food differs from that of the Hindoo as well as the Mahomedan; they never eat the cow or bullock, but the jackal, porcupine, hog and wild boar, deer and tigers, are sought after and used by them. They deny that robbery is ever made a regular mode of earning a subsistence; an honesty, however, that the people among whom they dwell give them but little credit for. Indeed, from my own observation, on an occasion that brought the circumstances of a community to the light, it is difficult to believe that the great sums found in their possession could have been honestly earned. They live by thieving, making grass screens and baskets. The men likewise attend at festivals, marriages, and births, as musicians, which has obtained for them the name of Bajantri; and at the reaping season all resort to the fields to beg and pilfer from the farmers, for they will not be induced to put their hands to labour. The women, too, earn a little money by tattooing on the skin the marks and figures of the gods, which the females of all castes of Hindus ornament their arms and foreheads with. The Bajantri Korawa reside in mud huts, in small societies outside the walls of the village to which they have temporarily attached themselves. The age for marrying is not a fixed time; and, different from every other people in India, the youth of the female is not thought of consequence, the old man telling this

when a lad with mustaches just appearing, having been married to a woman who, five years previously, had attained maturity ; a marriage that would have been opposed to the customs, and repugnant to the feelings alike of Hindoo and Mahomedan. To this wife he yet remains attached, though it is not unusual to have two, three, or four wives in one household, among this people. In marrying, at the hour pronounced to be fortunate by a Brahmin, the bride and bridegroom, smeared with turmeric, are seated on the ground, and a circle drawn with rice around them. For five days the musicians attend before their door, and the whole concludes by the neighbours gathering round and sprinkling a few grains from the rice circle over the couple. The married women wear the tali round their necks, which is broken on the husband's death by the relatives of the deceased. This people live virtuously ; the abandonment of their daughters is never made a trade of, and other classes speak favourably of their chastity.

They respect Brahmins; and though they never, or at least very rarely, attend places of worship, they seem to respect the gods of the Hindoo mythology, and keep in their houses small silver images of Hanuman, which they once every two or three months worship with songs, and sacrifice and music. Their foreheads, too, are tattooed with the mark of Vishnu ; but they offer up no daily prayers.

THE TELING KORAWA, OR KORAWA OF TELINGANA.

This branch of the Korawa people are generally known as Kusbi, Korawa, Aghare Pal Walé, prostitute Korawas, the sitters at the doors of their tent ; but these names the people themselves consider opprobrious. The form of their features is altogether different from that of the Bajantri Korawa, the shape and expression of the countenance being similar to the inhabitants of the Coromandel coast—the country, if we judge by their name, Teling, whence they originally migrated : but wandering from place to place for a livelihood, wherever the Madras troops marched under Sir Arthur Wellesley, they followed, and are now found located in most British cantonments. The Teling Korawa gain a livelihood by basket-making and selling brooms, in making which their wives assist ; but their chief means of subsistence is in the prostitution of their female relatives, whom, for that purpose, they devote to the gods from their birth.

When the lives of children in India are despaired of, the fond mother, whether Mahomedan or Hindu, wills that it should live, though sickness and destitution be its lot through life; and when agonized by the prospect of its death, she vows to devote her offspring to the service of the deity, should its life be spared. With the Mahomedans, the male children thus devoted become durveshes, and their females termed 'Mustanis,' attach themselves to one or other of the four large communities of Fakirs, who beg in India, the Mustanis being supposed to live a life of virtue. Among the Hindus, again, there are two classes of devoted women, the one attending the temples and living a life of chastity, the other class fulfilling the vows of their relatives, by promiscuously sacrificing to sensual love. The Brahmins, who, worshipping a deity generally as pure theists, whether followers of Brahmna, Vishnu, or Siva, are seldom guilty of thus throwing their females on society; and this practice seldom obtains among the better classes of Hindus even. But as this pursuit of the women thus devoted, however public it may be, entails no disgrace upon the women themselves, or their families, many of the low castes and migratory tribes of the Hindus have readily taken to a practice which allows them to follow a profitable calling, without suffering in the opinion of their neighbours; and as the poorest and most wretched community in India attach the utmost importance to the purity and conjugal fidelity of their unmarried and married females, the low castes and outcasts to whom money offers a great temptation, devote their female children in their earliest infancy, and thus are able to practise their profession without restraint.

The goddess, in whose service the lives of the Teling Korawas' devoted women are thus to be spent, has her chief shrine near Bellary. They never devote more than one of their daughters; the rest are married and made honest women of. The devoted women, notwithstanding their loose lives, occasionally bear children, so many as four having been the children of one mother. These children are treated as if legitimate, being admitted without purchase to all the rights and privileges of the caste. It is probably owing to this intermixture that the varied colours we find among them arise, changing in individuals from the fairness of the Brahmin to that of the darkest coloured Sudra.

They have no rules or laws among their community for self-government. They eat the deer, the hare, and the goat; but the cow is con-

sidered a sacred, and the hog an accursed, animal, and never used as food. No one can read or write.

They are very rarely allowed to reside inside towns; but when this liberty is granted them, they pitch their tents or erect grass huts at a distance from the dwellings of respectable people. The women wear a boddice (choli) open in front, and a sarhi; the men dress as Hindus usually do.

This branch bury their dead, and the food that was most liked by the deceased is placed at the head of the grave. The most favourable omen of the state of the departed soul is drawn from its being eaten by a crow; less auspicious if by a cow; but if both the crow and cow decline to eat it, they deem the dead to have lived a very depraved life, and impose a heavy fine on his relatives for having permitted such evil ways.

Their religion is the brahminical, and Brahmins assist at all their ceremonies. Their language is nearly similar to that spoken by the Bajantri Korawa, with whom they agree in the arrangement of the Korawas into four branches. The other two, in addition to the Bajantri and Teling Korawa, I never met with. They are called Koonsi Korawa, and the Patra Korawa, or Patra Pulloo. Their manners and habits and mode of life are scarcely dissimilar from one another; all of them can converse in their own language, but they do not eat or marry with an individual of a different branch.

THE BHATOO.

This migratory people are known in India by the name of Doomur or Kollati. They are spread over the whole of the great continent; but though retaining among themselves the name of Bhatoo, they are arranged into several distinct tribes, speaking different tongues, and holding no intercourse with each other. One of these tribes occupies the country from Ahmednuggur in the north, to Hurryhur in the south, and lie between Bellary and the western shores of India.

The Bhatoo are seldom tall, rarely exceeding five feet two inches in height, and the women attaining a proportionate size. At the period of adolescence, however, the young men and women are perfect models for the sculptor, the plumpness of that age rounding off the form, and hiding the projecting bones and the hollows between the muscles,

which, in after life, the profession that both sexes follow too prominently develop. They are "Athletæ;" and the boys and girls are trained to the most surprizing feats of agility from their earliest infancy. Besides this, which is their ostensible mode of gaining a livelihood, the men of this wandering people earn sums of money by exorcising demons from the persons of those they possess;* but what they most trust to for support is devoting their female relatives to the gods.

The various castes of Hindus have their various gods, at whose shrines the children are devoted; but the god of this Bhatoo is Kandoba,† in the village of Jeejoorie, near Poona. About the age of five they carry their female relations there, and after performing sacrifice, and burning frankincense, they lay the girl at the feet of the deity, to which she is now considered married. These devoted women, and all the male children, are regularly trained to athletic exercises, and the community wanders from village to village to exhibit. Most of their feats are performed by means of a bamboo. On the morning of the day they intend exhibiting, they abstain from all food, and to this rule they attribute much of their freedom from disease; and my informant, an old man sixty years of age, can recollect no instance of rupture among them. Before his own eyes, however, he has seen four people killed by falls from the bamboo, innumerable injuries sustained by others, and he himself has his right elbow joint fearfully crushed.

They settle unimportant points among themselves by arbitration, but all serious matters are brought for the decision of their British rulers. They are totally uneducated; the old man giving me this information has never seen or heard of any one who could read or write. Impressed with the belief, prevalent throughout India, that the muscular system does not retain its vigour after marriage, the Doomur or Bhatoo delays marrying till middle-aged; and then, owing to the great expense the ceremonies when taking a young wife occasion, the Bhatoo usually allies himself with a woman who, having been devoted to the gods in her infancy, has now become too old to make

* Insane people are frequently taken to have the demon cast forth to these people, and are occasionally placed in a cleft of a tree,—these, of course, are not benefited by the processes, but demons are frequently cast out of people who had no demons in them.

† An incarnation of Mahadeva.

a trade of her charms, and too stiff to take a part in the athletic exhibitions. Two or three hundred rupees are expended in marrying a young wife; but the ceremonies for the older women are completed in a day, and cost only ten or twelve rupees. Yet, notwithstanding this mode of life, they are not unprolific, my informant having seen five, six, seven, and even eight children born of one woman who had been devoted in her infancy to the gods.

They never eat the hog, the cow, the bullock, or the horse. They call themselves Mahrattas, but their religion seems essentially different from the Hindus aroundthem. They own attachment to none of the three great divisions of the brahminical faith, and when asked whom they worship, they reply, "Narayan," the Spirit of God; but the particular object the Bhatoo pays his devotions to is the bamboo, with which all their feats are performed. At the village of Thekoor, near Kittoor, the shrine of the goddess Karewa has been erected on the summit of a hill, around the base of which dense forests of bamboo grow. One they select, and the attendants of the temple consecrate it. It is now called "Gunnichari" (Chief,) and receives their worship annually. To it, as to a human chief, all respect is shewn; and in cases of marriage, of disputes requiring arbitration, or the occurrence of knotty points demanding consultation, the gunnichari is erected in the midst of the counsellors or arbiters, and all prostrate themselves to it before commencing the discussion of the subject before them. The Bhatoos do not keep idols.

All the dead are buried; when they consign one of their people to the earth, they place rice and oil at the head of the grave, and stand near to watch what creature comes to eat it, drawing the happiest omen of the state of the departed from the crow visiting the spot.

THE MUDDIKPOR.

Many names have been given to the migratory people we are now noticing; Keeli Katr, or Kootaboo, Kublgira or ferryman, Koli, and Barkur, are those most usually employed; but Muddikpor is the designation they apply to themselves. They are generally tall and powerful men, with an olive-yellow complexion, and are now very numerous throughout India. They say their original locality was the village of Talicot, near Sorapore, and that however far they be

now dispersed, all classes continue to speak the Mahratta tongue, though they must likewise acquire a knowledge of the language of the country they wander about in, to enable them to earn a livelihood. Their traditions carry back their origin to the obscure periods of Hindu history; and they say they have sprung from ten individuals, and thus account for the ten tribes into which we now find them divided; and this traditionary account of a common origin receives corroboration from the circumstance that all the tribes marry and eat together.

In each tribe an individual is superior to the others, to whom the rank descends by birth, though no title is attached to the office. All disputes that arise are arranged by a jury, whose decisions are made in accordance with the customs of their forefathers received by tradition.

These wanderers earn a living by catching fish with nets, and their women earn a little by knitting, and by tattooing the dark blue marks on the foreheads of the brahmins and lingaets; but their chief occupation is the exhibition of the transparencies used in representing the battles of the Panch Pandya, five brothers, whose exploits are we believe, detailed in the Ramayuna. The figures are painted on deer-skin with very brilliant colours, and the story being one the Hindu never tires in listening to, in every village after night-fall you may see the representation of the battles, and hear the Keeli Katr describing the heroes' deeds.

Their females are very virtuous, and one woman has been known to give birth to twelve children. Reading and writing is unknown among them. Their dress and food are the same as the Hindus among whom they dwell.

They live in square huts formed of grass sewed together, the whole being perhaps a rupee in value. These they themselves make and carry with them at their periodical migrations, which custom renders obligatory every three months,—a longer stay would, they say, subject them to some dire calamity; and as the third moon passes by, the spot that yesterday was a merry encamping ground, is to-day a desolate and unoccupied waste.

The Muddikpor seemed to me to have no idea of a Supreme Being. They pay their devotions to the transparent figures with which the

battles of the Panch Pandya are represented: the box of bamboo containing them is each morning placed on a part of the floor fresh covered with cow dung; and on the lid being opened to expose the drawings, they burn frankincense, and bow down to the ground in worship, —"Oh Panch Pandya, by you we live, continue to give us our daily bread!"

They are not restricted to one wife, and they bury all their dead, except lepers, whom they burn.

The languages spoken by these tribes are not understood by any one of a tribe different from their own, though there seems a general similarity among them, as will be seen from the few words I obtained. The Sanscrit, Tamil, Telogoo, Guzerattee, and Maharattee, have been placed to enable a comparison to be made.

ENGLISH.	SANSCRIT.	TAMIL.	TELAGOO.	GUZERATTEE.	MHARATTEE.	GOHURIE.	BOWRIE.	TAREMOOKEE.	KORAWAEE.	BHATOOEE.
Earth	Bhoomé	Bhoomi	Bhooné	Zameen	Poortooi	Jamee	Bhoé	Mattri	Tirri	Bhooé
Stone	Pashan	Kulloo	Rai	Pather	Duggr	Bhatta	Bhattoo	Duggroo	Kellay	Pathar
Water	Ap Ootk.	Tanni	Neel	Pani	Pani	Pani	Pani	Pani	... ...	Pani
River	Naddi	Ar	Eeroo	Nuddi	Nuddi	Nandie	Nandie	Nudd	Ar	Nai
Tree	Vrikoh	Marm	Chet	Jharr	Dzar	Jharr	Jhar	Jharr	Mooroo	Jhar
Bread	Bhoojn	Roti	Ruttie	Rotli	Bhakrie	Bhatta	Rutto	Bhatur	Retti	Ruttie
Sunshine	Ooshun	Vayil	Eenda	Tirkhoom	Nimber	Turko	Taoro	Turko	Wuggul	Ghum
Fire	Agni	Nerpu	Nepu	Attas	Vestoo	... ...	... ...	... ...	Nerpu	Ugg
Wind	Waioo	Kath	Gali	Paon	Warra	Warr	Waero	Waroo	Kas	Bara
Deer	Mirg	Maun	... ...	Hirn	Hirn	Kuryar	Hirn	Hirn	Chigree	Hirn
Man	Manish	Mansum	Mansi	Manus	Manus	Gohur	Mankhoe	Lokro	Amloom	Moons
Woman	Streea	Pomli	Armansi	Baidi	Baikoe	Gohurni	Manussi	Chali	Punjeri	Jo
Husband	Rutti	Amli	Pemli	Mati	Navra	Gohur	Bhowrie	Bhoyé	Managa	Matoe
Wife	Stree	Pundati	Pemloom	Bairri	Baiko	Gohurni	Bawun	Baiko	Koolsi	Bako Kudjia
Boy	Balig	Payun	Kurrur	Chokro	Chokra	Chora	Chora	Porwyo	Amlamoo	Chora
Girl	Cunya	Sirki	Ar Pella	Chokrie	Chokrie	Chorie	Chorie	Lokri	Hena Maga	Chorie
Son	Shuphoo	Magn	Kurpoe	Dekro	Chokra	Chora	Cheea	Beto	Amlamoo	Chora
Daughter	Kunna	Maga	Kootroo	Dekrie	Chokrie	Chorie	Cheei	Porni	Magga	Bittie
Father	Peeta	Appin	Tinree	Bawa	Bapp	Bap	Baoo	Aoo	Aoo	Bappo
Mother	Mata	Amma	Amma	Mairee	Ai	Yaree	Aya	Ai	Amma	Yajee Amma
Bull	Virishab	Maroo	Eeddoo	Dorr,Burrod	Bail	Bullog	Dhando	Bail	Marr	Bail
Cow	Gao	Pussoo	Ao	Gae	Gae	Gowrie	Gai	Gai	Akl	Gai
Horse	Ashp	Coodrie	Gurrum	Ghora	Ghoro	Ghora	Ghoro	Ghoro	Coodrie	Ghora
Mare	... ...	Putta Coodrie	Ar Gurrum	Ghorie	Ghore	Ghorie	Ghorie	Ghorie	... ...	Ghorie
Dog	Shwan	Nai	Kookka	Kuttro	Kuttra	Kuttra	Kuttreo	Kuttro	Nai	Kutta
Bitch	... ...	Putta Nai	Ar kookka	Kuttie	Kuttrie	Kuttrie	Kuttri	Kuttri	Putta Nai	Kuttie
Boar	Sookur	Punni	Moga Pendi	Dookr	Dookr	Soor	Koor	Dookr	Pandee	Tunda
Cat	Sookri	Poni	Pellee	Billari	Manjan	Balai	Billé	Mandur	... ...	... ...
Cock	Koorkoot	Chawul	Poonzoo	Murgh. Kokur	Koomra	Kukro	Kokro	Kokro	Korla	Kukur
Hen	Koorkooti	Kolie	Korie	Kokri	Komri	Kukrie	Kokrie	Kokrie	Korlie	Kukun
Duck	Budhag	Bat'h'h	Bat'h'h	Butah	Batto	Budah	Budhug	Budhug	... ...	Budah
Tiger	Wiagr	Peeli	Peeda Pooli	Bag. Gaj	Wag	Bag	Wag	Wag	... ...	Bag
Goat	Ajja	Arroo	Meka	Buckra	Bokr	Cheela	Bokro	Bokro	Mekur	Buckra
Sheep	Ajja	Koorm Arroo	Goorie	Menda	Meenda	Meenda	Gadri	Mhendaj	Goorell	Mhendee
Jackall	Jambook	Narri	Nakka	Kola	Kola	Salia	Nohrie	Koloo	... ...	... ...
Birth	Junnumkar	Pergalm	Kantadi	... ...	Prassut	Wokin	... ...	Jannas	... ...	... ...
Marriage	Bewaha	Kalyanam	Penli	Lagan	Lagan	Beha	... ...	Hurwo	... ...	... ...

English.	Sanscrit.	Tamil.	Telagoo.	Guzerattee.	Mharattee.	Gohurie.	Bowrie.	Taremookee.	Korawaee.	Bhatooee.
Death	Mritthoo	Saogalam	Sao	Mouat	Mella	Murgeo	... ...	Murŕgo	... ...	... ...
Hot	Ooshum	Soorra	Oorgoo	Oonoo	Wasnoo	Tattoe	Oon	Garm	Suralla	Tatta
Cold	Thaud	Arootoo	Saldi	Tharoo	Thand	Sheela	Seetul	Thad	Thand	Sheela
Great	Praood	Pirrs	Pedadi	Mothnoo	Mota	Muthoe	Wadial	Mato	... ...	Muthœ
Small	Lahan	Chimnada	Chinadi	Nana	Lahan	Nankia	N'hänü	Nahango	... ...	Nankia
Bad	Wyte	Katadoo	Chidadi	Nakaroo	Wyte	Naswie	Khrab	Khrab	Narad Ketso	Sarya
Good	Samichenum	Nalado	Munchadi	Saroo	Changla	Acho	Achewat	Bess. Changloo	Nalado	Nikko
Quick	Tewra	Shigrum	Tirri	Ootawa	Jaldie	Judkurdie	Mullie	... ...	Méné	Juldee Bhigi
Slow	Shunni	Mulloom	Medligoo	Hurwé	Halloo	Hullia	Hullo	... ...	Logo	Hulloo
Hunger	Shuddha	Pussi	Akkli	Bookh	Bookh	... ...	... ...	Bookh	... ...	... ...
Thirst	Trish	Tawum	Dupaki	Tirs	Piass	Tursi	... ...	Tars	... ...	... ...
Calf	Watso	Kunnoo Oti	Doora	Wachroe	Wasroe	Kera	Keldie	Wasro	Kero Kuttie	Parra
Hare	Sussar	Mossvl	Koondel	Sussoo	Sussa	Sussia	Dhantrie	Susroe	Kundelli	Sussa
Ass, Male	Garho	Kalide	Garrdé	Gudhairoo	Garrhoo	Gudha	Gudhanoo	Gadhroo	... ...	Gudha
— Female	... ...	Putta Kalidé	Aa Garrdé	Gudhairee	Garrhwi	Gudhie	Gudhairie	Gudhri	... ...	Gudhie
Kite	Ghar	Prandu	Gedda	Khalell	Ghar	Sumlie	Khumlié	Ghar	Perzah	Ghar
Crow	Kag	Kaka	Kaki	Kagra	Kaora	Kagla	Kogroo	Kooroo	... ...	Kasla
Shoe	Jora	Papoos	Papoos	Joro	Jora	Kasra	Chumpalé	Joro	Papoos	... ...
Sarhi	Wastra	Porawé	Koka	Sarhi	Lugra	Sarhi	Khari	Lugroo	Selhi	... ...
Sword	Seelita	Catti	Ketti	Turwar	Turwar	Turwar	Turwar	Tirwar	Ketti	Turwar
Black	Krisha	Karp	Nalpo	Karo	Kalung	Kaloo	Kajuloo	Kala	Kart	Kala
White	Shoobra	Virlé	Telkoo	Oojroo	Saped	... ...	... ...	... ...	Wulla	Dhowra
Red	Ratawai	Saipoo	Eeer'pu	Ratho	Tamburum	Rathro	Khoondur	Lall	... ...	Lall
Yellow	Petawar	Manjoo	Patsadi	Peloo	Peola	Pela	... ...	Puloe	... ...	Peela
Green	Heerwar	Hitché	Pasroo	... ...	Heerwa	... ...	... ...	... ...	Pusroe	Herwa
Blue	... ...	Neelum	Nelpoo	... ...	Parwa	... ...	... ...	... ...	... ...	Nela
Wheat	Ghodoon	Godmi	Godmalloo	Goun	Goun	Goehoon	Gohoon	Gähoo	Godmi	Gehoon
— Flour	Choorn	Man	Pindi	Attoe	Kuneek	Attoe	Lote	Peet	Man	Atta
Grinding Stone	Ghirt	Yendrum	Terigalay	Ghatti	Ghirtee	... ...	Ghiltrie	Ghirti	... ...	Chickie
Head	Kuppul	Talli	Talla	Matho	Dooka	Mathoe	Goddo	Mathoe	... ...	Moondhi
Eye	Doli	Kunnoo	Kanloo	Ankh	Dora	Ankhi	Dolo	Dolo	... ...	Akhœ
Nose	Nashik	Mook	Mookka	Nak	Nak	Nak	Nak	Nak	... ...	Luk
Ear	Karn	Kaddoo	Chouloo	Kan	Kan	Kan	Kan	Kan	... ...	Kunnoo
Hand	Hast	Kaiee	Chai	Hat	Hath	Hath	Hatha	Hath	... ...	Hut
Foot	Pa	Kall	Kalloo	Pug	Pae	Pae	... ...	Pug	... ...	Pae
Thumb	Ankta	Peri Virlm	Botnell	Angatoe	Angotha	Angotha	Bote	Angoto	... ...	Bode

Vocabulary of Goand and Cole Words. From Dr. Voysey's *MSS.*
Ellichpoor, 16th December, 1821.

We took the Goand, our guide, with us down the hill to our tents, for the purpose of examining him more closely, and writing a small Vocabulary of his language. He spoke Hindoosthanee and Marhatta with great fluency, and we found not the slightest difficulty in making him understand us. I asked him his diet, to which he replied, buffalo's flesh, hog's flesh, &c. There was some equivocation concerning his eating cow's flesh, which he first admitted and afterwards denied; his objects of worship were Aboo Bekker below the hill, and Baum Deo upon the hill. The following is the vocabulary of words:—

English.	*Coour Goand.*	*Marhatta.*
man,	hejuh ? dota.	
woman,	juffare.	
water,	da,	to ask, komruju.
fire,	singhel.	
earth,	kansa,	dohree.
stone,	yotha.	
tree,	seeng.	
honey,	shuhud,	doomboor.
milk,	doodh,	dedum.
hill,	doongur.	
house,	oarra.	
grass,	jhana,	jhana.
mouth, (1st) chaboo,	koto,	ota.
eyes,	moonh,	meht.
nose,	meht,	moonh.
hair,	ap.	
bread of wheat jowarris,	sokra.	
flesh,	jeloo.	
cow-dung,	shena.	
urine,	kooknum.	
to give,	ikija.	
to bring,	salija,	lana, lena ani.
to drink,	noweja,	dasalija.

English.	*Coour Goand.*	*Marhatta.*
to eat,	jomeja.	
to strike,	kwageja.	
to call out,	hujeeja.	
to sleep,	gitijeeja.	
to rise,	bidija,	hujoomen.
to sit,	soobangeja.	
to ask where is he gone,	chota walunja.	
to bind,	tolkeja.	
to open,	itikeja.	
wine,	seedho,	daroo.
to run,	saroobija.	
1,	mea.	
2,	bariah.	
3,	aphe.	
4,	uphoon.	
5,	munace.	
6,	turrume.	
7,	aya.	
8,	ilhar.	
9,	arhe.	
10,	gyl.	
11,	ekrah.	
20,	bees.	
100,	chedy.	
stars,	ipeel.	
god,	gomoie sun.	
penates,	mootiah.	
draw god,	kawra.	
bedstead,	parkoum.	
many,	gonai.	
tiger,	koda.	
antelope,	gotharic.	
buffalo,	butkil.	
sambur,	roec.	
cotton,	capoos.	
bamboo,	mat.	

Memorandum.

It is remarkable that no two words are similar, with the exception of doongur and jharra. The Goands south of the Nerbudda are called Coour.

Choka near Hoshungabad 12th March, 1823.

Two Goands came and gave me the following synonyms in their language to those of the Goands of the Gawilghur range, whom they call Coour. They neither eat or intermarry, but consider themselves a distinct tribe.

Goand.	*Pl.*	*English.*	*Goand.*	*English.*	
wurra,	mansa,	man.	jemra,	strike.	
mace,	air,	woman.	wonaro,	to call.	
yeer,		water.	namseen,	sleep,	nerma.
kis,		fire.	teda,	open,	tunda
durtee,		earth.	tunda,	rise.	
tonghee,		stone.	lul,	wine.	
murha,		tree.	sookoom,	stars.	
phookee,		honey.	permesur,	god,	permesur.
pall,		milk.	parapen,	village god,	hunooman.
pallme,		ghee.	peemal,	penates,	dooloopen.
kone,		house.	kuttool,	bedstead.	
todee,		mouth.	wullai,	many.	
kunk,		eyes.	hermee,	buffalo,	yermee.
			mawinda,	thulma,	sambre.
musur,		nose.		male,	dad.
			peerka,	a child,	unturra.
chootee,		hair.		female,	bien turra.
saree,		bread.	jado,	a boy's name.	
soree,	khaurk,	flesh.	meengo,	a man's name.	
sropie,		cow-dung.	bhao,	a man's name.	
seemke,		to give.	coorap,	buttermilk.	
turraka,		to bring.	goknasaree,	wheaten bread.	
oonjena,		to drink.	kola,		
tinjena,		eat.	oonka parsi,	language.	

At Anund, where I examined a Cole, I found the words in general the same with those of the Coour Goand of Ellichpoor; the numerals exactly the same. I was informed of this circumstance before by Wilson, who

had ascertained the fact from Captain Jackson. The number of similar words is about three-fourths, including the verbs, which appear to have the same radical.

Vocabulary taken at Chunooh, 2d April, 1824.

man,	hoko.	cat,	joomemen.
woman,	herako.	strike,	allumrooya.
water,	da.	call out,	koorkoortooweemen.
fire,	singhel.	sleep,	geteemen.
earth,	hausa.	rise,	tingoomen.
stone,	sukum.	sit,	doobmen.
tree,	darao.	ask,	senwaboo.
honey,	doomoor.	bind,	tolemen.
milk,	towah.	open,	rahemen.
hill,	booroo.	run,	neerum.
house,	oah.	stars,	gpeel.
grass,	,,	god,	,,
mouth,	ah.	penates,	,,
eyes,	meht.	bedstead,	parkoum.
nose,	mooanh.	many,	isoo.
hair,	oop.	tiger,	kola.
bread,	,,	antelope,	kotharie seleep.
flesh,	geloo.	buffalo,	bitkilko.
cow-dung,	gooree.	sambur,	saram,
urine,	dooki.	cotton,	katsoom.
to give,	immeymen.	bamboo,	mart.
bring,	haraow koomen.	wine,	arkee mad kum.
drink,	noweemen.	arrow,	sarr.

Numbers.

1,	mea.	[boonga.	9,	arhe.
2,	bariaba,	desoom-	10,	gyl.
3,	aphia.		100,	mesye.
4,	uphoom.		1,	kurrea.
5,	munace,	singbooen.	2,	boepace.
6,	turrune,	diggy.	3,	korar,
7,	aya,	kora soon-	4,	angreea.
8,	ilhar.	[die.	5,	champeca.

6,	chakee.	14,	gojoh.
7,	kandehum.	15,	koonteah.
8,	sirka.	16,	barjo.
9,	lagoorec.	17,	seedhoo.
10,	sinko.	18,	diggy.
11,	sooreen.	19,	soondee.
12,	poortee.	20,	buddra.
13,	marlah.	21,	gagoree.

On the History of Arakan.—*By Capt.* A. P. Phayre, *Senior Assistant Commissioner Arakan.*

The following sketch of the history of Arakan I put forward chiefly in the hope of attracting others to this field of enquiry. A compilation was made at my request from various ancient chronicles, by *Nga-mi*, one of the most learned among the literati of his country, and I proceed to furnish an epitome of its contents. Many copies of the *Radza-weng*, (History of Kings,) are to be found among the Arakanese, differing from each other in details, being ample or scanty in the narrative, according to the research or imagination of the authors, but, all agreeing in the main facts of the national history. On the Burmese conquest of the country, the ancient chronicles were sought after with avidity, and destroyed or carried away, in the hope apparently of eradicating the national feeling. These efforts were, however, futile, many of the ancient books were secretly preserved, or carried away by the owners on their emigration to the adjoining British territory, where many chiefs anxiously watched for an opportunity to recover their country.

The Arakanese generally take a deep interest in the history of their native land; they still regard it as being one of the most favoured countries of the world, and as having been, in ancient times, among the most powerful of kingdoms. Their pride even makes them affect to regard the occupation of it by the British, as a national re-conquest from the Burmese, achieved by themselves, because a number of Ara-

kanese refugees, being formed into a levy, accompanied the British army of invasion, and fought by its side.

The Arakanese are of the same stock as the nation which inhabits the valley of the *Era-wadi;* their national name is *Myamma*, a word which by the Burmese is pronounced *Ba-ma*, and thence changed by Europeans into Burma. They are a section of that nation, separated from the parent stock by mountains, which, except towards the southern extremity of the range, admit of little intercourse from one side to the other. Hence those Arakanese living in the northern portion of the country, adjoining Bengal, have some peculiarities in dialect and manners. There they touch upon a people totally different from themselves in race, in language, and religion. There the original Mongolian features of the people have become considerably modified, the nose being more prominent and the eyes less oblique than they are found to be among the people of the South of Arakan and in Burma Proper. Whether this change is the result of a partial intermixture of race, or other causes, I am not prepared to say.

The province of Arakan, taking that term as applied by the British, includes all the highland and lowland territory which extends from the head of the *Naf* estuary in lat. 21° 10′ N. down to Cape Negrais in lat. 16° 2′. The great mountain range called *Yu-ma*, or *Yō-mu*, runs in a general direction nearly due North and South, forming the Eastern boundary of the country. On the West is the sea, and as the coast branches out from the South in a N. N. W. direction, the country from being very narrow at its southern extremity becomes on the Northern border about one hundred miles broad from East to West. The Northern, and by far the richest portion of this tract, or that lying between about 20° and 21° 10′ N. lat. was alone called by the natives *Rakhaing-dyi* or *Rakhaing-land*, while the rest of the country, consisting of the islands of *Ran-byi* and *Ma-oung*, (Cheduba,) and the district of *Than-dwai*, (Sandoway,) was included in the general term of *Rakhaing-taing-gyi*, or Rakhaing kingdom.

The word *Rakhaing* appears to be a corruption of *Rek-khaik*, derived from the Pali word *Yek-kha*, which in its popular signification, means a monster, half-man half-beast, which like the Cretan Minotaur, devoured human flesh. The country was named *Yek-kha-pu-ra* by the Budhist Missionaries from India, either because they found the

tradition existing of a race of monsters which committed devastations in a remote period, or because they found the *Myam-ma* people worshippers of spirits and demons. It is possible that these traditions of human-flesh-devouring monsters, arose from exaggerated stories concerning the savage tribes who inhabited the country when first the *Myam-ma* race entered it. The names given to some of these monsters bear a close resemblance to names common among the *Khyeng* and *Kami* tribes to this day. Popular superstition still assigns to each remarkable hill and stream its guardian *Nat* or spirit, to whom offerings are made; and this elf-worship is the only acknowledgment of a superior power made by the wild hill tribes now living within the boundaries of Arakan. From the name of the country *Rakhaing*, the people now generally call themselves *Rakhaings*, as distinctive from the Burmese, though the term is strictly applicable only to those who live in the northern portion of the country, or Arakan Proper.

The *Myam-ma* nation evidently had no knowledge of writing until it was communicated to them from the continent of India or from Ceylon; and this event, if we may judge from the history under review, occurred during the second century of the Christian era. Up to that period therefore we must conclude, that the main facts of the national history were transmitted by tradition; nevertheless we have long tales and details of prior events; these have no doubt partly been invented by successive copyists and commentators, and partly amplified from original facts. The Arakanese being instructed in letters and religion by people from the West, gradually mixed up their own genuine traditions with the histories or fictions of their teachers. As the Budhist religion taught that before the advent of Gautama, who flourished about the middle of the sixth century B. C., there had existed during the present world-era three successive *Budhas*, whose lives and the intervening periods occupied an indefinite duration of time, it thence became the ambition of the newly-taught disciples, to blend their line with those nations among whom the *Budhas* had appeared; hence arose confused stories of monarchs from various countries in India establishing themselves and building cities in Arakan; all these may be laid aside as fiction. The duration of each king's reign from a remote period is given in the history, the date assigned for the accession of many of the sovereigns since the year 863, corresponding to

A. D. 1501, are confirmed by coins, some of which are in my possession.

Having deemed it necessary to say thus much by way of preface, I now proceed with my epitome of the history.

The writer opens with a declaration of devotion to the three treasures: "Deity, Law, and the Assembly of the Faithful," and invokes the angel *Tho-ya-tha-ti*, that he may be inspired with eloquence. He then states his plan as follows:—

"I propose to give the history of all the kings sprung from the *Budden-ggu-ya** race, descendants of king *Maha-tha-ma-da* in lineal succession, who reigned in *Yek-kha-pu-ra*, that royal golden *Rakhaing* land, which is like the city of *Maha-tho-da-tha-na*,† ten thousand *yu-ja-na*‡ in extent, placed on the summit of Mount *Myen-mo*, two hundred and fifty thousand *yu-ja-na* in extent, and in attacking which the fierce *A-thu-yas*§ are constantly defeated, which is situated on the surface of *Jam-bu-di-pa*,‖ thirty thousand *yu-ja-na* in circumference, being honorably placed at the summit, where all its enemies cannot prevail against it."

Having pronounced this eulogy upon his country, the historian proceeds to narrate the origin of mankind.

"When the present world-era first arose, *Byahmas*¶ coming to the earth, saw in the centre thereof, five tiers of lotuses, together with the eight canonical requisites;** having plucked these, a *Byahma* interpreting the omen, said: In this world-period there will appear five Budhas,

* This race of kings is stated to have first reigned in *Ba-ra-na-thi*, or Benares.

† A city on the summit of Mount *Myen-mo*, which is the centre of the Sekyah system. A Sekyah system comprises a central *Myen-mo* Mount, the surrounding seas and islands, the celestial regions, and the infernal regions. (Judson's Bur. Dicty.)

‡ *Yu-ja-na*, a measure of distance comprising about thirteen miles.

§ *A-thu-ya*, fallen *Nat* or Spirit, formerly driven from the summit of the *Myen-mo* Mount. (Judson.)

‖ The world we live in, being the southern of the four great islands which surround the *Myen-mo* Mount.

¶ *Byhama*, a celestial being, superior to *Nats*.

** These consist of, 1. *Theng-kan*, a priest's upper yellow garment, or mantle; 2. *Theng-boing*, a priest's lower garment; 3. *Fakot*, part of a priest's dress, worn as a scarf across the shoulder; 4. *Khaban*, the girdle; 5. *Kharoing*, water dipper; 6. *Thengdon*, or razor for shaving the head; 7. *Theng-bit*, earthen dish for holding rice; 8. Comprising two articles of use, viz. *Ka-nyit* or stylus for writing on palm leaf, and *Ap*, or needle, for sewing the canonicals.

therefore it will be called *Badda-kap-kam-bha.** Those great *Byahmas* having enlightened the four great islands, by the brightness of their bodies, and having eaten of the crust of the earth,† returned to their own celestial abodes. Some of these *Byahmas* having thereby mysteriously passed to another state of existence, could not return; they became new beings, and nine were allotted to each of the four great islands. Then eating of the fruits of the earth, they became subject to lust, guilt, ignorance and passion; from them five females were first formed, and afterwards four males. Thus were the four classes of men‡ established, and gradually spread abroad; these (four pair) separating into families, one woman remained; she was intended to be concubine to the king."

The history next proceeds to relate, that men multiplied, and wickedness increased in the world; at length appeared the embryo of *Kauk-ku-than*, the first *Budh* of the present period; he reigned in *Ba-ra-na-thi* under the name of *Maha-tha-ma-da*, the first of the many who bore that title; his descendants were in process of time called Brahman kings. In their time, many of the sacred books were revealed, and all earthly objects received their names. The length of man's life was ninety millions of years.

A king of this race named *Wa-ya-adz-dzyau-ya* had sixteen sons; the world was divided amongst them, and the city of *Ram-ma-wa-ti*, built by *Nats*, near the present town of *Than-dwai* (Sandoway,) fell to the share of the eldest, named *Thamu-ti-de-wa*. His descendants reigned in *Ram-ma-wa-ti*. In their time, several sorts of grain were given to man; weights and measures were first used, and men were taught various useful arts. Some kings of this race are represented as being of Brahmanical, and some of Budhist, faith. *Ra-ma-wa-ti* was subject to the kingdon of *Ba-ra-na-thi*.

Many ages after, when the Budh *Kau-ku-than* had passed away, a king named *Tsek-kya-wa-de* reigned in *Bara-na-ti*. He was the

* *Bad-da-kap-kam-bha*, a grand period of time distinguished by five *Budhs* in succession. (Judson.)

† The former world had been destroyed by fire, which had finally been extinguished by water, the drying process had caused a clayey crust to form on the surface, described as being of a delicious flavour.

‡ These consist of, 1. Kings, in Pali *Khat-ti-ya*; 2. *Brahma-na*; 3. Merchants, *Wethi-ya*; 4. The people at large, *Thud-da*. This classification has never actually existed in Arakan.

Budh *Gau-ta-ma*, in an embryo state; in a subsequent birth, he became *Man-dat Meng*, or sovereign of the Sekyah system; he is therefore now allotted this title in anticipation; while king of *Ba-ra-na-thi*, he had four sons, among whom he divided the world. To the eldest *Thu-ri-ya Thau-da* he gave the central portion and the city *Pa-ta-na-go;* to the second, *Tsan-da-than-da*, the northern portion and the city of *Pin-tsa-pu-ra;* to the third son, *Ma-ni-thu-bha-was*, he gave the southern portion and the city of *Randa-pu-ra;* to the fourth son, *Kan-myeng*, were allowed all the countries inhabited by the Burman, Shan, and Malay races from *Ka-thi* (Munnipur,) to the borders of China.

Kan-myeng came to *Ramma-wa-ti*, and dispossessing the descendant of *Tha-mu-ti-de-wa*, married a princess of that race named *Thu-wan-na-ga-hlya;* while *Maha-ra-dza-ngya*, the male descendant of *Tha-mu-ti-de-wa*, was sent to govern the city of *Wetha-ti* in Arakan Proper. "*We-ra-khaings*," says the historian, "had from the first, from the time of *Tha-mu-ti-de-wa*, been in possession of *Ram-ma-wa-ti;*" yet he next proceeds to narrate how king *Kan-myeng* peopled his dominions with various tribes, and among the rest, appear the progenitors of the Arakanese, as being now brought to the country for the first time; in short, the attempt to reconcile national traditions with the Budhist writings, has produced inextricable confusion.

Kan-myeng collecting men from different countries of the west, (Hindustan,) having a variety of languages, brought them to *Ram-ma-wa-ti;* they then asking for subsistence and a place to live in, to the first who so applied he gave the name of "*Thek*,* and their language being different from the rest, they lived separate. The king then assigns names to the rest of his followers, (a far-fetched etymology being given for each of them,) who became the progenitors of the various Indo-Chinese tribes and nations. The names of the tribes after "*Thek*" are as follows: *Khyeng*,† *Mye*,‡ or *Myu-khan-tsaung-*

* This is a small tribe living among the hills in Arakan Proper; they are described in an "Account of Arakan" in the Jour. Asiat. Soc. for 1841, p. 683, under the name *Doing-nak*.

† A tribe living amidst the *Yu-ma* mountains.

‡ A tribe now nearly extinct, formerly living on the *Kula-dan* river in Arakan Proper, on the present possessions of the *Ka-mis*, with whom they are confounded by the modern Arakanese.

khyan,* *Kyip*,† *Shin-du*,‡ *Mu-du*, *Pyu*§ *Me-kha-li*,‖ *Dzeng-me*, *Leng*, *Tan-teng-tha-ye*,¶ *A-tsim*,** *Leng-khe*,†† *Pyan-laung*,‡‡ *Ka-the*,§§ *Kan-ran*,‖‖ *Tho-dun*, *Ta-loing*,¶¶ *Kan-ti-ka-myum*,*⁎* *Lawoik* and *La-gwon*.†††

The race of *Kan-myeng* reigned in *Ram-ma-wa-ti* for a period of years, expressed by an unit followed by one hundred and forty cyphers. During this time the Budhs *Kauk-kuthan*, *Gaw-na-gun*, and *Ka-tha-ba* flourished and passed away.

The history has now arrived at the close of what may be called its Indian period, and in the new chapter that opens, the leading events appear to be derived from national tradition. The names which are given above to the Arakanese and Burmese; viz. *Kan-yan* and *Pyu*, we may infer to be original names for two of the many petty tribes into which the *Myam-ma* nation was probably divided, before it was united into one comparatively civilized people by the instruction of the Budhist Missionaries from India. The seat of the *Pyu* empire was Prome, after the destruction of which city, it was re-established at *Puggan*, A. D. 107.

The historian now changes the scene of his narrative to countries east of Arakan. The chapter opens thus:—

" *Maha-tha-ma-da*, the sovereign of *Jam-bu-dip* dying, the religion of the Lord *Ka-tha-ba* being then in the ascendant, (the) life (of man) extended to thirty thousand years. In that time in the country of *U-ta-ya-ma-dhu-ya*,‡‡‡ *Tha-ga-ya De-wa* was king; (he) in power,

* A small tribe living among the *Ka-mis*.
† A tribe near Mannipur.
‡ A tribe N. and N. E. of the *Ka-mis*.
§ *Pyu*, a name by which a portion of the Burmese nation was formerly designated.
‖ A Shan tribe.
¶ A tribe said to live on the borders of China.
** Now called *Pashyu*, the Malays.
†† A tribe in Arakan Proper, or rather the hills N. W. of it.
‡‡ A Shan tribe said to be famous for growing tea.
§§ The Munnipuris.
‖‖ Said to be the present *Rakhoing* race, or a portion of them termed *Khyoung-tha*.
¶¶ The *Taloing* is said to have united with the *Tho-dun* tribe.
⁎ A tribe now called *Myun* in Arakan Proper.
††† These two tribes are said to be the ancestors of the Siamese.
‡‡‡ By this term is meant the country North from Ava, what is now called *Mogaung*, the valley of *Hu-kung*, &c.

glory, ability, and skill, was perfect. From that king sprung a son *Maha Tha-ga-ya;* to him were born two sons, *Tha-ga-ya* and *U-ba-tha-ga-ya.* At the same period in the country *A-thet-teng-tsa-na,** reigned a prince of the same race named *De-wa-keng-tha;* to him was born a son *Maha-keng-tha*, and to *Maha-keng-tha* were born two sons, *Keng-tha* and *U-ba-keng-tha;* also a daughter *De-wa-kap-pha.* At the very moment of that princess's birth, the astrologers (said) thus: From this princess will be born ten sons, who will completely destroy king *Keng-tha's* line."

Maha-keng-tha determines therefore to place his daughter in a strong building with one attendant, and surrounded by guards, to prevent the approach of any one. *Maha-keng-tha* dying, his eldest son *Keng-tha* ascends the throne.

At this time *Tha-ga-ya* ascends the throne of *U-ta-ya-ma-dhu-ya;* he becomes suspicious of his younger brother *U-ba-tha-ga-ya*, who is obliged to fly for his life; he comes to *A-thet-teng-tsa-na*, and is hospitably received by king *Keng-tha.* The fugitive prince by chance comes one day in sight of the building where the princess *De-wa-kap-pha* is immured; the history proceeds.

"The Prince *U-ba-tha-ga-ya* beheld her from a distance; the princess appeared dazzling as the sun and moon, very beautiful; shining in perfection, like the heavenly *Nat Thu-dza;* † from the secret influence of acquaintance in former existences, they had an inclination of the mind towards each other. The prince by many artifices silently concealing himself, conveyed a message through the slave girl *Nan-di-gaw-pa;* she indeed is young and indiscreet, and not considering consequences, delivered the message to the princess, according to instructions; having obtained the consent of the princess, the prince repeating charms and spells, and making himself invisible, reached the building, and there united with the princess. Before long she being with child, *Nan-di-gaw-pa* and the watchmen fearing for themselves, on account of that calamity, represented it to king *Keng-tha.*"

It is finally determined by the king, that as the prediction of the astrologers applies only to male children, his sister shall be given in

* This is said to be Pegu.

† Wife to *Thi-kya Meng*, the king of *Nats.*

marriage to *U-ba-tha-ga-ya;* if female children are born, they are to be spared, but if males to be destroyed. The princess first bears a daughter who dies young; then ten sons in succession, whose lives are preserved by an artifice, and last, another daughter. The two eldest sons are named *Wa-thu-de-wa* and *Ba-lade-wa;* the daughter *Eng-tsa-na-de-wi.* The subsequent story refers principally to these three.

The ten sons grow to man's estate without the real history of their birth being known; they grievously oppress the people of the country, till at length complaints are made to the king; he orders them to be seized, but they elude their pursuers and fly to a distant country, where through the favour of a great sage and devotee, they obtain magical weapons from the Nàts; they then return, attack the king's palace, and kill both him and his brother. Thus they become masters of *A-thet-teng-tsa-na.* Next they attack the neighbouring countries, and having conquered *A-yudz-dza-pu-ra,* or Siam, turn their arms against *Dwa-ya-wa-ti,* the Pali name for the present town of *Than-dwai* (Sandoway), which was then ruled by *Na-rin-da,* a king of the race of *Kan-myeng.*

Arriving by sea at the mouth of the *Than-dwai* river, they are foiled in their attempts to find the city, which by some is said to have the power of soaring above the earth, out of reach of danger, and by others this is said to have been an illusion produced by its guardian *Bhi-hi.* By the advice of a *Ya-the,* or hermit, the brothers propitiate the *Bhi-hi* with offerings, and she then withdraws her protection; the ten brothers now bind the city with an iron chain to the earth, from which circumstance the present name *Than-dwai* (iron bound) is deduced. The city then falls into the hands of the invaders.

The brothers divided their conquest into ten shares, but made *Than-dwai* their chief capital. After sometime the eight younger brothers are slain in a conflict with the people of the country, who appear to have risen against them; *Wa-tha-de-wa* and *Ba-la-de-wa,* with their sister *Eng-dza-na-de-wi,* are obliged to fly; they are accompanied in their flight by a *Pun-na,* or Brahman, who now appears for the first time.

These four direct their flight Northwards: arrived at a forest in the present circle of *Toung-up,* they meet with a *Bhi-lu,* who has assumed the appearance of a man. This is king *Keng-tha* who comes to revenge

the murder committed upon him in his previous existence. He invites them to wrestle, and the challenge is accepted by *Ba-la-de-wa* who is soon killed and eaten by the *Bhi-lu.* The three others pursue their journey; *Wa-thu-de-wa* is accidentally killed by a dart thrown by a hunter at the moving grass, where he supposes an animal is concealed; from thence the *Pun-na* and the Princess *Eng-dza-na-de-wi* go on together; most of the names of places on the coast are derived from incidents occurring to them during this journey. They continue on until they arrive at *We-tha-li,* the chief city of Arakan proper, and the remains of which still exist. They find the race of kings descended from *Ma-ha-ra-dza-ngya* is extinct; the people of the country elevate the *Pun-na* to the throne; he is married to the Princess *Eng-dza-na-de-wi,* and after a long and prosperous reign, their son *Brahma Thun-da-re* succeeds; he marries a Princess of the former dynasty, named *The-rin-pa-re,* and their descendants fill the throne for an indefinite period. During the time of this dynasty, ninety-nine cities were built or Townships established to the East, and ninety-nine to the West, of the *Ga-tsha-bha,* the chief river of Arakan.

The story of the ten brothers, sons of a northern prince by a Taloing Princess, coming into Arakan, seems to refer to the first arrival of the *Myam-ma* race from the Eastward, and must be derived from genuine tradition. The tale of the *Pun-na,* or Brahman, is of course an interpolation of later times, though it is not easy to understand why a Budhist nation should invent this fable, and represent a Brahman as the progenitor of one of their dynasties. All the names given to these personages it will be remarked are Pali; indeed Native names for kings and great persons do not appear in the history until a very late period.

In the latter times of the *Pun-na* race, there lived together in the *Hi-ma-won-da,** a monkey and a deer. A violent storm arising they were carried away by a flood, and at length floated to the head of the *Ga-tsha-bha,* or *Kula-dan,* river, and from thence to *Khouk-taw-toung,* a hill on the bank of that stream. There the monkey and deer entered the forest and lived. The deer produced thirty-two children; some

* An immense but imaginary forest, in which most of the wonderful things mentioned in the Budhist scriptures are said to be. (Judson.)

were in the human shape, others were *Bhi-lus ;* these *Bhi-lus* ravaged the country, devouring men and women; at length the last king of the *Pun-na* race was destroyed by them, but the queen and a princess were saved.

This legend perhaps refers to the warfare the Burman race had to wage against the aborigines, the present savage hill tribes, who already possessed the country when they themselves entered it, and who probably long after struggled for independence. The *Bhi-lus* are described as lying in ambush, and seizing all who ventured out of their houses after dark: the description in fact much resembles that of a partisan warfare carried on against invaders. The names given to some of these *Bhi-lus*, bear a resemblance to names common among the *Ka-mi* tribe to this day ; and their fabled origin from wild animals of a forest far to the North, beyond the source of the *Kula-dan* river, agrees pretty nearly with the present received opinions of the *Rakhaings* concerning the Ka-mis, viz. that they originally came from the North, and are little better than wild beasts.

To remedy this sad state of affairs, a hero at length appears to the rescue of the *Myam-ma* race, whose birth is thus traced.

In the country of *Kap-pila-wot,** reigned a powerful king named *Adz-dzun-na* who determined to abandon his kingdom and become a hermit. He retired to the *Hi-ma-won-da* forest, and wandering on Southwards, reached at length the source of the *Kula-dan* river ; there he determined to live far from human habitations in devout retirement under the shade of a *pipal* tree. The wild animals came to do him homage, and amidst a herd of deer, appears a doe called *In-da-ma-yu*, described as descended from a lion, which in a former existence had been wife to the king *Adz-dzum-na ;* it had been foretold by *Nats* that as the country *We-tha-li*, (Arakan) suffered from *Bhi-lus* born of a deer, so should it be rescued and restored by a man produced from the same animal. A violent tempest arises ; the doe *In-da-ma-yu*, is carried by a flood down the *Kula-dan*, and cast ashore near the mouth of the *Mi-khyoung*, a tributary stream which joins the *Kula-dan* in its upper course ; there in the midst of the forest she brings forth a hu-

* A city in Hindoostan (Capilavastie, in Rohilkhand.)

man child. A chief of the tribe called *Myu*,* was out with his dog, which while ranging the forest sees the child in the jungle and commences barking; the *Myu* chief approaches, takes the child home and adopts him; eventually this child marries the chief's daughter, and being furnished by the *Nats* with magic weapons, clears the lowland country of the *Bhi-lus*, who hitherto had ravaged it. He is acknowledged as king, marries the female descendant of the *Punna* dynasty, and builds a new capital, which is called *Dhi-ngya wa-ti*. He is called *Ma-ra-yu*, a derivative from his mother's name.

From this king the Arakanese historians profess to furnish lists of successive sovereigns without a break up to the time of the Burman conquest in A. D. 1784. *Ma-ra-yu* gained the throne at the age of 18 years, and died after a reign of 62 years, aged 80.

Of this race, according to *Nga-mi*, though this does not exactly agree with other accounts, there reigned fifty four sovereigns throughout a period of 1833 years; at this rate *Ma-ra-yu* ascended the throne about 2658 years B. C.

At the end of that period an insurrection occurred, and three nobles successively usurped the throne. The queen of the last descendant of *Ma-ra-yu* escaped with her two daughters, and retired to a hill named *Ni-la-pan-toung*.

About this time in the country of *Theng-dive*† there lived a king *Abhi-ra-dza* who had two sons; they quarrelled regarding the succession to the throne, and the eldest, called *Kan-Ra-dza-gyi*, was obliged to fly. He is represented as descending with a large army the river *Era-wa-ti*, and then ascending the *Khy-eng-dweng*. He crosses the *Yu-ma* mountains from the present province of *Yau*, and reaches the upper course of the *Mi-khy-oung* in Arakan proper; there he establishes himself on a well known hill, called to this day *Khy-oung-pan-toung*.

* I am not sure whether by this name is meant the tribe now called *Toung Myu*, of which only a few scattered remnants exist, or whether it is merely another name for the present *Ka-mu* tribe. Some Arakanese say that in remote times the *Myu* was a very powerful tribe on the *Kula-dan*, which has been driven out of its possession by the *Ka-mis* who came from the North; but all the Arakanese literati I have asked have but vague ideas of the lineage of the hill tribes now existing.

† This is Tagoung N. of the city of Aba, the ancient capital of the empire; vide Journal of the As. Soc for March 1836, where the account of the two sons of Abhi-ra-dza is related by Colonel Burney from the Burmese Chronicles, precisely as given in this history by *Nga-mi*.

The queen of the *Ma-ra-yu* dynasty there joins him, and he marries her two daughters; he remains on this mountain for twenty four years before he ventures to descend to the plains, which during that period remained subject to usurpers; at length he comes and makes *Dhi-ngya-wa-ti*, his capital; this is called the second dynasty of that city. This conquest appears to be a second irruption of the people from whom the Arakanese themselves were descended, or perhaps of a mixed horde of *Myam-mas* and *Shans*. *Kan-Ra-dza-gyi* is succeeded by his son *Thi-la-ra-dza*. Of this dynasty twenty-eight kings reign in succession, throughout a period of 971 years. By this chronology *Kan-ra-dza-gyi*, crossed the *yu-ma* mountains B. C. 825.

At the end of this period *Tsan-da Thu-ri-ya* ascends the throne. In his time the Bridhi *Gautama*, "blossoms" in the country called *Ka-pi-la-wòt;* while lodging in the *Dze-da-won Kyoung* or monastery in *Tha-wot-ti*,* he is invited to Arakan by the king. *Gautama* arrives, and relates his various forms and existences during previous births in Arakan, and points out the Pagodas which contain relics of himself. He is received by the king with the reverence due to so exalted a personage. An image, being an exact resemblance of the Bridh, was permitted to be cast, and was set up at *Ma-ha-mu-ni*, where a temple was built for its reception, the ruins of which still exist. This image, to which miraculous powers were attributed, remained at *Maha-mu-ni* until carried by the Burmese to Ava, where it still remains. The Lord *Gautama* then confirmed the name of *Dhu-ngeja-wa-ti* given to the country by former Budhs in consequence of its great fertility; and leaving Arakan proper travelled southward to the town of *Than-dwai* from whence he went eastward to the city of Prome. The king *Tsan-da Thu-ri-ya*, died after a glorious reign of fifty-two years.† This king is generally reckoned as the head of a new dynasty, since the religion of *Gautama* was introduced during his reign; of this dynasty there reigned in lineal succession twenty-five sovereigns (making fifty-two from *Kan-Ra-dza-gyi*) throughout a period of 642 years.

* Name of a district or city in Hindoostan, (Sravasti in Kosala.)

† The list of Arakan kings given in the historical and statistical sketch of Arakan by Mr. Paton, published in the 16th Vol. of the Asiatic Researches, commences from this sovereign. The chronology of the history I possess differs considerably from that; according to Mr. Paton *Tsanda Thu-re-ya* died A. D. 701; according to *Nga-m's* history A. D. 198.

At the end of this time *Ma-ha-toing Tsan-da-ya*, the lineal descendant of *Kan-Ra-dza-gyi* ascended the throne. The astrologers declared that the destinies of the city *Dhi-ngya-wa-ti* were accomplished; the king therefore went forth from it in the second year of his reign, in the month *Ta-tshoung-mon* of the year 151,* and finally settled on the former site of *We-Tha-li*, called also *Khyouk-hle-ga*, which city was re-established in the month *Ra-tohon* of the year 152. This king died after a reign of twenty-two years. In his time it is stated that several *Ku-la*, or foreign ships, were wrecked upon the Island of *Ranbyi*, and the people in them, said to be Musulmans, were sent to Arakan proper, where they were settled in villages. This king is reckoned the founder of a new dynasty.

He was succeeded by his son in the year 172, who being born when the full-moon was rising, the sun being still above the western horizon, was called *Thu-ri-ya-Taing Tsan-da-ya.* The ninth sovereign of this race is named *Tsu-la-taing Tsan-daya*, who succeeded to the throne in the year 313. In the year 315 he went on an expedition to Bengal (called *Thu-ra-Tan*,) and set up a stone pillar as a trophy at the place since called *Tset-ta-goung*, or as commonly written *Chittagong*, alluding, this history states, to a remark of the king's, (who abandoned his conquest at the request of his nobles) that to make war was improper.

The king returned to Arakan, and being troubled with headache he consulted his wise men, who informed him, that in a former birth he existed as a dog in a country bordering on China; that dying, his skull fell into the forked branch of a tree, which when agitated by the wind pressed upon the skull, and so influenced the living head of him, now born as a man. The only certain cure was to have the skull removed

* This is the first date that occurs in this history and is equivalent to A. D. 789. As Gautama is said to have visited Arakan during the reign of *Tsanda Thure-ya*, who ascended the throne 642 years before this sovereign, it follows that *Gautama* was alive according to this history in A. D. 147. Now the Arakanese state that this present year 1843 A. D. is the year of *Gautama's* attainment of *Pa-ri-nib-ban* 2387; they acknowledge that this era is derived from sacred books deposited in Burmese monasteries, and appear to admit its correctness, though it militates against their own historical chronology. It is probable that the Budhist religion was first introduced during the reign of *Tsan-da Thu-ri-ya*, and that the figment of *Gautama's* visit, invented to gratify national vanity, has been ignorantly assigned to the period of that monarch's reign.

from the tree. The king determined therefore to go to China, though he was warned by the astrologers that the time was not propitious. Before going he presented the queen with a magic ring he had received from *Thi-kya*, the king of *Nats*, appointed her to rule over the kingdom in his absence, and directed that in case of his death, he was to be king whom the ring would fit. The king then departed by sea, and passing *Jhan-divai* reached *Henza-wadi* or Pegu; he then ascended the *E-ra-wa-ti* to Prome, at that time the capital of the *Py-u* or Burman Empire, and from thence going on northwards, at length reached the country he was in search of, which appears to have been subjected to *Theng-dive* or *Ta-goung*. There he was honorably received by the king, and soon commenced a search for the tree containing the dog's skull; this being found he caused it to be burnt, and built a Pagoda near the spot. The king remaining a long time as if forgetful of his home, his attendants roused his attention by singing the song of his own country, and then at their solicitation he prepared to return. On reaching the sea, the greater part of the boats were lost, and the king was drowned in the sixth year of his reign. This occurred in the year 319, and is supposed to be effected by the *Naga* or Ocean Monster, at the solicitation of his daughter, in order that she may possess the king, whose wife she had been in a former birth.

The scene of this disaster is laid off the extreme southern point of the coast, a few miles south of Cape Negrais. The chief minister carried the mournful intelligence to the queen; she suspected him of having contrived the disaster, and banished him from the kingdom.

Search was now ordered to be made for one whom the ring, left by the king, would fit. All the men of the country, great and small, were tried, but not one could wear it. People were therefore dispatched to search among the hill tribes. They found two brothers, chiefs of the *Myu* tribe, named *A-mya-tu* and *A-mya-ku*, with the son of the latter *Pe-byu*, casting a net into the waters of the *Mi-khy-oung*. The ring was found to fit all three, and they were brought to the royal city. The eldest of the brothers, *A-mya-tu*, was married to the queen *Tsau-da-de-wi* in the month *Taboung* of the year 319, and was saluted as king. After he had reigned six years, the queen having intrigued with his younger brother *A-mya-ku*, he enticed the latter

into a forest, under pretence of worshipping the mountain *Nat*, and there killed him with an arrow.

The *Pyu* sovereign who reigned at Prome, hearing of these transactions, invaded the kingdom to expel the *Myu* chief, but lost his army in the *Yu-ma* mountains, and was obliged to retreat. The king *A-mya-* died after a reign of seven years; on his death, his nephew *Pe-byu* married the queen *Tsauda-de-wi* in the month of *Pya-tho* 326.

The city *We-tha-li* was now abandoned, and the king established his residence on the site of the present city of Arakan, then called *Myouk-a.* After *Pe-byu*, had reigned twelve years, the country was invaded by a Shan prince called *Thoa-kheng-bhwa-kye*, who took the royal city, and despoiled the *Maha-mu-ni* temple of its gold ornaments. The king and queen fled to a hill in the upper course of the *Yo* stream, and there remained concealed. These events occurred in the year 338.

For eighteen years from this time the country remained subject to the invaders, and the annalists record no events. The *Taloyings* are said to have possessed *Thau-divoi* during the period. At length the Shan's army retreated, carrying away a number of prisoners, who are said to have been settled at *Tsa-kaing*, near the present city of *Ava.*

Soon after the *Pug-gan* king *Anaw-rahta-dzan*, who appears at this time to have been supreme in the present Burman empire, invaded Arakan, for the purpose of carrying away the celebrated image of *Gaw-ta-ma* from *Maha-mu-ni*, but retired without effecting his object.

After these protracted troubles there appeared a son of the king *Tsu-la-taing Tsa-da-ya;* he was born six months after that king's departure for China, and is represented to have remained concealed among the *Theh* tribe, in the hills on the upper course of the river *Ma-yu.* He is called *Nga Meng-nga-tum;* with the help of the *Thek* tribe, he ascended the throne in the year 356 and established his capital at *Tsam-bha-wet*, on the river *Le-myu.* The kingdom was again invaded by the *Pug-gan* king, and *Nga-meng-nga-tum* was killed after a reign of twenty-four years.

The queen of *Tsu-la-taing Tsa-da-ya* was still living on the *Yo* river; some years before, on the death of the *Myu* chief *Pe-byu*, she had married a nephew of her first husband, named *Tsan-da-ku.* This marriage produced two sons, namely *Khet-ta-theng*, and *Tsan-da-*

theng; also a daughter *Ge-ri-kuma-ri.* The eldest son married his own sister, (a common practice in ancient times with the Arakanese and Burmese royal families) and with the assistance of *Anaw-ra-hta-dwza,* king of *Pug-gan,* ascended the throne in the year 380. He established his capital at *Ping-tsa,* and died after a reign of ten years. His younger brother *Tsan-da-theng* succeeded him in the year 390. Four of his descendants reigned in succession; in the reign of the fifth, named *Meng-phyu-gyi,* a noble usurped the throne in the year 422; another noble deposed him, but in the year 423, the son of *Meng-phyu-gyi,* named *Meng-nan-thu,* ascended the throne and reigned five years.

The third in descent from him, *Meng Bhi-lu,* was slain by a rebellious noble named *Theng-kha-ya,* who usurped the throne in the year 440.

The heir apparent, *Meng-re-bha-ya,* escaped to the court of *Kyan-tsit-tha* king of *Pug-gan.*

The usurper reigned 14 years; his son *Mevg-than* succeeded him in the year 454, and reigned eight years; on his death, his son *Meng-Padi* ascended the throne.

During this period, the rightful heir to the throne, *Meng-re-bha-ga* was residing unnoticed at *Pug-gan;* he had married his own sister *Tsau-pouk-ngyo,* and there was born to them a son, named *Let-ya-meng-nan.* The exiled king died without being able to procure assistance from the *Pug-gan* court for the recovery of his throne. At length the king of that country, *A-laung-tsi-thu,* grandson of *Kyan-tsit-tha* sent an army of 1,00,000 *Py-us* and 1,00,000 *Talaings* to place *Let-ya-meng-nan* upon the throne. This army marched in the year 464; after one repulse the usurper *Meng-Pa-di* was slain, and *Let-ya-meng-nan* restored to the throne of his ancestors in the month *Nat-dau* 465.*

* A Burmese inscription on a stone discovered at Budha Gaya, a facsimile and translation of which by Colonel Burney, are given in the 20th Vol. of the Asiatic Researches, serves to confirm the account given in this history, of the restoration of *Let-ya-meng-nan,* or as he is called in the stone inscription, *Pyu-ta-thin-meng,* i.e. "Lord of a hundred thousand *Pyus.*" The dates of the inscription which were considered uncertain, are no doubt meant to be 467 and 468, approximating as these do to the date assigned in the Arakan history for the restoration of *Let-ya-meng-nan.* It is evident from the tenor both of the history and the inscription, that the Arakan prince was regarded as a dependent of the *Pug-gan* king, to whom he had from his birth

The allies of the restored king attempted to carry away the *Maha-mu-ni* image, whereby it was much injured.* The royal capital was established first at *Loung-kyet*, but that site proving unhealthy, the city of *Ma-rin* was built in the year 468. This king reigned six years.

Four kings followed in quick succession, after whom *Gau-la-ya* ascended the throne in the year 495. He is described as a prince of great power, to whom the kings of *Bengal*, *Pegu*, *Pug-gan* and *Siam* did homage. But his chief claim to distinction rests on his having built the temple of *Ma-ha-ti*, a few miles south of the present town of *Arakan*, the idol in which was, in sanctity, inferior only to that of *Ma-ha-mu-ni*. This temple and image were destroyed during the late war, the height on which the temple stood, being occupied as a position by the Burmese forces. This king died, after a reign of twenty years, in 515.

He was succeeded by his son *Da-tha-Ra-dza*, who upheld his father's fame, and repaired *Ma-ha-mu-ni* temple, which since its partial destruction by the *Py-u* army in *Let-ya-meng-nan's* time, had remained neglected; the idol which had been mutilated was also restored, the tributary kings being employed on the work. This king died after a reign of twelve years in 527.

He was succeeded by his son *A-nan-thi-ri*. This prince grievously oppressed his people, and neglecting the affairs of government, passed his days in riot and debauchery. He lost the extensive empire possessed by his father and grandfather, neglected religious duties, and extorted large sums of money from the people, till the whole country, says the historian, cursing him in their hearts, a general rising occurred; he was deposed and killed, and his younger brother *Meng-phun-tsa*, reigned in his stead in the year 529.

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birth been a suppliant for aid; in return for the assistance granted him for the recovery of his grandfather's throne, he was to aid in rebuilding the temple at Budha Gaya, in the name of the *Pug-gan* sovereign. The archetype of the inscription has evidently been written by an Arakanese, or the stone was engraved by an Arakanese workman, from a peculiarity in the spelling of certain words, still prevailing among the Arakanese.

* The possession of this idol with which the fortunes of Arakan were supposed to be inseparably united, appears to have been long an object with the Burmese monarchs. It was not forgotten when they conquered the country in A.D. 1784. They then succeeded in carrying it to Ava, where it still remains.

This prince established his capital at *Khyit*, on the river *Le-myo*. A Shan army attempting to invade the kingdom, was defeated in the *Yu-ma* mountains; a number were taken prisoners, and settled in two villages on the tract of country in Arakan Proper, now called *Toungphek*. This king died after a prosperous reign of seven years.

In the reign of his grandson *Gana-yu-ban*, a noble named *Tsaleng-kabo*, usurped the throne, but proving oppressive, was murdered in the first year of his usurpation.

Mi-dzu-theng, the younger brother of *Gan-na-yu-bau*, was now raised to the throne; he removed the capital to *Pingtsa*, close to the present town of Arakan. The oldest Arakanese coins extant, having the emblems of royalty engraved upon them, but without any date or inscription, are traditionally said to have been struck during this reign. This prince was surnamed *Taing-khyit*, or "country beloved." With characteristic extravagance, he is said in the history, to have reigned over the present Burmese dominions, and a great part of India, as far as the river *Na-rin-dza-na*, and to the borders of *Nipal*.

The succeeding ten kings pass like shadows, without any thing worthy of notice except their short reigns. The five last of them reigned only for one year each, and by their oppression and neglect of religious duties, the people were dissatisfied, while sickness and famine desolated the country. The *Nats*, or spirits of the seasons, withheld their aid; the earth no longer yielded her fruit, and general misery prevailed. The last of these wicked kings was deposed, and his son *Let-ya-gyi*, ascended the throne in the year 572. He by his mild government, restored the prosperity of the country.

In the year 599, *A-lau-ma-phyu* succeeded to the throne, and removed the capital to *Lyung-kyet* in 601. This king made war upon the *Pug-gan* sovereign, and received tribute from the king of Bengal. He died after a reign of six years.

His son *Ra-dza-thu-gyi* succeeded. In this reign the Talaings invaded the southern portion of the kingdom, but were repulsed by the Arakanese general *A-nan-thu-gyi*; nothing worthy of notice occurs until the reign of *Nan-kya-gyi*, who ascended the throne in the year 630. This king oppressed the people with heavy taxes, and levied contributions of goods which he stored up in his palace. By various

acts of tyranny, he incurred the hatred of many influential men, and even the priests, whose religion forbids them to notice worldly affairs, are represented as inimical to him. A fanciful tale is related of the means taken to procure his death. A certain noble, who was the *Tsi-tha-beng*, or commander of the body guard, whom he had deeply offended, conspired with two religious students, who were said to possess the power of metamorphosis, an art which the king had formerly learnt from them. The two brothers assuming the form of wild buffaloes approached the capital; information thereof being brought to the king, he, unaware of the deception, ordered a hunting party to be formed, and went out to see the sport. As soon as he saw the buffaloes, he knew them to be the magicians transformed, and endeavoured to escape by flight as a parrot. The brothers instantly assuming the form of hawks, followed in pursuit. The king finding he could not escape, dropped his disguise, and fled towards a *Kyoung*, or monastery, where he implored the protection of the head priest. The priest reproaching him with his oppressive conduct repulsed him, and he fled to an adjoining temple, where he concealed himself in the hollow part, containing an image of *Gau-ta-ma*, and shut the gate. The brothers followed him, and threatening to apply fire to the gate, he came forth, and was slain by them on the spot, in the fourth year of his reign.

He was succeeded by his son *Meng-bhi-lu*, who married the daughter of the *Tsi-tha-beng*, the conspirator against the former sovereign. This prince is described as being if possible more hateful than his father; being jealous of the supposed high destinies of his infant son *Meng-di*, he ordered him to be cast into the river, but the child was miraculously preserved, and rescued by some fishermen. He was then sent to a remote part of the kingdom. These and other similar acts inflaming the minds of the people against him, he was slain in a conspiracy headed by the *Tsi-tha-beng*, after a reign of four years.

Tsi-tha-beng, the king-maker now usurped the throne, but was himself killed in the third year of his reign.

The son of *Meng-Bhi-bi*, named *Meng-di*, was then raised to the throne, when he was only seven years of age. This king gave general satisfaction, and enjoyed a long and prosperous reign. In the year 656, the Shans invaded the kingdom, but were repulsed. The king of

*Thu-ra-tan,** or Bengal, named *Nga-pu-kheng*, courted his alliance, and sent presents of elephants and horses. After this, his dominions being again attacked in various quarters by the *Shans*, the *Burmese*, the *Talaings*, and the *Thek* tribe on the north, the king went to the *Ma-ha-mu-ni* temple, and depositing his rosary before the idol, vowed to rid his country of its enemies. In pursuance of his vow, he marched in person, in the month *Nat-dau* of the year 674, to repel the Talaings, who had possessed themselves of the country south of the town of *Than-dwai;* his uncle *Udz-dza-na-gyi*, was sent with an army to attack *Pug-gan; Tsa-leng-ga-thu*, his brother-in-law, advanced into *Pegu;* and the general *Ra-dza-theng-kyan*, was sent against the *Thek* tribe.

The city of *Pug-gan* was taken, the Talaings were overawed, and the expedition against the *Thek* tribe, after being once repulsed was eventually crowned with success. After this the general *Ra-dza-theng-kyan* subdued the country along the sea coast, as far as the Brahmaputra river.

In the year 689, the *Pug-gan* sovereign made an attack upon the island of *Ran-byi*, and carried away a number of the inhabitants who were planted on the Munipur frontier. After this, the *Than-dwai* viceroy having gained possession of a relic of *Gautama*, brought from Ceylon, by virtue of which he expected to attain sovereignty, rose in rebellion. A pagoda was built over the relic, which still exists. The *Than-dwai* viceroy was finally reduced to obedience. Soon after this, *Meng-di* died after a reign of 106 years, aged 313.

Nothing worthy of notice occurred, until the reign of *Thin-sti*, who succeeded to the throne in the year 752. In the year 756, he marched to attack the *Pug-gan* empire, the capital of which was established at *Eng-wa* or Ava. During his absence, the governor of *Than-dwai*, styled the *Tsi-tha-beng*, revolted, and seizing the boats which had transported the king's army along the sea coast, and were now left on the shore for his return, he made the best of his way to *Loung-kyet* the capital, where he set up the absent king's infant son *Ra-dza-thu*.

* This may be meant for Sunargong, the capital of the eastern district of Bengal when it first revolted from the Delhi Empire A. D. 1279. The event recorded in the text probably occurred about the year A. D. 1295. I cannot guess what Mahommedan name *Nga-pu-kheng* represents.

The king returned without delay to the capital, but his army deserting him, he was slain and his son proclaimed.

The *Tsi-tha-beng* not long after sent the young king to the southern extremity of the kingdom, and governed in his name; but becoming unpopular, he was after two years deposed, and killed by a noble named *Myin-tsaing-kyi*. The latter in his turn became disliked, and was obliged to fly to the Burmese dominions. The lawful king *Radza-thu*, was now restored in the year 759.

He was succeeded by his younger brother *Thing-ga-thu*. This prince after a reign of three years, was murdered by the chief priest of the country, in a monastery, with the connivance of his nephew *Meng-tsau-mwun*, who then succeeded to the throne in the year 766.

Shortly after his accession, he committed an act of tyranny which raised a rebellion against him, and this event caused a material change in the relations of the kingdom. It was the occasion of the first loss of its independence since the establishment of the second dynasty of *Dhi-ngya-wa-ti* under *Kan-Ra-dza-gyi*, more than two thousand years before. It was followed by internal dissensions throughout a long and unhappy period, till exhausted by the struggles of contending factions, the ancient kingdom of Arakan fell before the newly risen fortunes of the successors of *A-loung-phra*, in the Burmese empire.

Meng-tsau-mnwun forcibly gained possession of a lady named *Tsau-bo-ngyo*, the sister of the chief called *A-nan-thiu*. The brother determined on revenge, went to the court of Ava, and applied for assistance to dethrone the Arakanese king. The Burman monarch *Meng-tshwai*, approving of the design, sent an army of 30,000 men under his son, who attacked and gained possession of the city *Loung-kyet*, on Sunday the 5th day of *Nat-dau*, in the year 768. *Meng-tsau-mwun* fled to Bengal, the governor of Chittagong took from him his queen, *Tsau-mwe-sheng*, on which the fugitive king went to *Thu-raa-tan*, where the king received him with distinction.

The Burmese now gained undisputed possession of the country, and the king's son returning home, was appointed governor. A half brother of *Meng-tsau-mwen's* called in the Talaings, who advanced with an army of 50,000 men, and took the Burman governor prisoner. The Burmans, however, returned in force the following year (770,) and re-conquered the country. For several years, the Talaings and Burmans

struggled for the possession of Arakan, and the latter were finally expelled in the year 788, by the united efforts of the Arakanese and Talaings.

During this period, the dethroned king was residing at the court of the king of *Thu-ra-tan*, who being engaged in wars, could not afford him any assistance; while there, the Delhi king came to attack *Thu-ra-tan** with a large army, consisting of elephants, horses, chariots, and foot soldiers, also "dogs as large as bullocks,"† trained to war. By the advice of *Meng-tsau-mwun*, the dogs were disabled by means of iron hooks baited with raw flesh, seizing which, they were caught by the mouth and easily overpowered. The elephants and horses fell into pits dug for them, and covered over with straw and earth, at the bottom of which were iron spikes; thus the *Thu-ra-tan* king obtained a complete victory. The Arakanese exiled king taught the king's subjects the art of entrapping a herd of wild elephants by driving them into a space enclosed by a stockade and ditch; he also instructed them in the art of training elephants.

Out of gratitude for these services, the king determined to assist the exiled prince in the recovery of his kingdom. He appointed a general called in the Arakanese annals *U-lu-kheng*, (Wali Khan,) to command the army of restoration. This person, however, betrayed his trust, and joining with a *Ra-khaing* chief, named *Tse-u-ka*, they established a government, and imprisoned *Meng-tsau-mwun*. He escaped and fled to Bengal.

The king of *Thu-ra-tan* now appointed two nobles, named *Dan-ba-tsu* and *Ba-ba-tsu*, to carry out his intentions, together with a large army under the command of *Tshat-ya-khat*. They arrived with orders to place *Meng-tsau-mwun* on the throne, and bring back the head and skin of *U-lu-kheng*. The expedition was successful. *U-lu-kheng* suffered the fate his crime deserved, and the historian records in glow-

* As the Arakanese make sad confusion of all cities and countries in India, this may mean any king between Bengal and Dehli, probably the king of *Juanpur*. The fugitive must have reached *Thu-ra-tan* about the year A. D. 1407, when, and for some years after, in consequence of Timur's invasion, the Dehli sovereign was not in a condition to attack Bengal.

† This reminds one of the dogs of Tibet of the size of asses, mentioned by Marco Paolo, Book II, Ch. 37. I have known Burmans speak of a rather large English greyhound as being of the size of a pony, *i. e.* 12 or 13 hands.

ing terms the joy of the people, "from the inhabitants of the kingly city, to those of the smallest village in the empire," that the descendant of their ancient line of kings was restored to them.

The restored king, however, was forced to submit to the degradation of being tributary to the king of *Thu-ra-tan*, and from this time the coins of the Arakan kings bore on the reverse, their names and titles in the Persian character; this custom was probably first made obligatory upon them as vassals, but they afterwards continued it when they had recovered their independence, and ruled the country as far as the Brahmaputra river.

Meng-tsau-mwun having got rid of his allies, meditated a change of capital, and setting out on a journey to find a suitable spot, was miraculously guided to the site of the present city of Arakan, called *Myouk-u*,* by the figure of a handsome youth beckoning him on, but which constantly retreated as the monarch approached.

While searching for a proper site, numerous predictive signs of its future destiny were manifested;† with the concurrence of the astrologers, the city was founded on Sunday, the first day of the month *Taw-tha-leng*, in the year 792.

When *Meng-tsau-mwun* found his end approaching, as his sons were infants, he appointed his brother *Meng-kha-ri* heir to the throne, and closed his checquered career in the fourth year of his restoration, aged fifty-three years.

Having brought this sketch of Arakan history down to the foundation of that city, which continued to be the residence of the kings for three and a half centuries, until the Burman conquest in A. D. 1784, it is fitting to pause here, and resume the remaining portion of *Nga-mi's* history at some future period.

October, 1843.

* This spot it is supposed, had been shewn by omens and incidents in very remote times, to be destined as the site of a great city. It was temporarily occupied by the *Myu* chief, *Pai-phyu*, who ascended the throne in the year 326. A stone wall round the town, and one round the citadel, still remain. Immense labour has been expended on those works.

† Among the rest, five white *touktais*, (large lizards,) were found in the hollow of a tree. These are said by present interpreters of the omen, to mean the English, five of whose kings, "who shall shine as flame and be workers of truth," are to reign over the country, after which its independence will be restored, or the kingdom be established, subject to the performance of homage to the superior power.

Chronological Table of the Kings of Arakan.

No.	Name of Sovereign.	Date of Accession. B. C.	Ar. era.	Reign. Yrs.	Ms.	Relationship of each succeeding Sovereign.
	Dhi-ngya-wa-ti Dynasty.					
1.	Ma-ra-yir, ...	2666	....	62	0	
2.	Ma-ra-dzi, ...	....	....	32	0	Son.
3.	Ma-ra-on-leng, ...	...	....	53	0	Ditto.
4.	Ma-ra-rway-leng,..	....	....	48	0	Ditto.
5.	Ma-ra-bheng, ...	....	....	55	0	Ditto.
6.	Ma-ra-dzi, ...	....	....	33	0	Ditto.
7.	Ma-ra-keng, ...	....	....	32	0	Ditto.
8.	Nga-tshap-o, ...	....	....	21	0	An Usurper.
9.	Dwa-ra-tsan.dra, ...	....	....	40	0	Son of Má-ra-keng.
10.	Tho-la-tsan-dra, ...	....	....	33	0	Son.
11.	Tsan-da-thu-ri-ya-tsan-dra,.	....	....	37	0	Ditto.
12.	Ka-la-tsan-dra,....	....	....	40	0	Ditto.
13.	Ti-tsan-dra, ...	....	....	31	0	Ditto.
14.	Ma-dhu-tha-tsan-dra, ...	....	....	20	0	Ditto.
15.	Dze-ya-tsan-dra, ...	....	....	40	0	Ditto.
16.	Mok-kha-tsan-dra, ...	....	....	26	0	Ditto.
17.	Gun-na-tsan-dra, ...	....	....	12	0	Ditto.
	Three nobles reigned for seven days, three months, and eight months successively,	....	....	..	11	Usurpers.
18.	Kan-Ra-dza-gyi, ...	....	....	41	0	Grandson of Gun-na-tsandrá.
19.	Kan-Ra-dza-ngai, ...	...	....	36	0	Brother.
20.	In-da-thu-ri-ya, ...	....	....	35	0	Son.
21.	A-thu-rin-da-thu-ri-ya, ...	...	....	30	0	Ditto.
22.	Tha-ra-met-ta, ...	....	....	28	0	Ditto.
23.	Thu-ri-ya, ...	....	....	31	0	Ditto.
24.	Meng-thi,..	....	....	22	0	Ditto.
25.	Meng-ba, ...	....	....	22	0	Ditto.
26.	Tsi-oung, ...	....	....	28	0	Ditto.
27.	Ta-taing-theng, ...	....	....	31	0	Brother.
28.	Kyau-khoung-weng, ...	....	....	31	0	Son.
29.	Thu-ri-ya-nan-da-mit, ...	....	....	21	0	Ditto.
30.	A-thu-rin-da-bha-ya, ...	....	....	31	0	Ditto.
31.	Let-ya-tsi-thu-kyi, ...	....	....	32	0	Ditto.
32.	Thi-ha-ka, ...	....	....	43	0	Ditto.
33.	Meng-bhun-than,.. ...	....	....	31	0	Ditto.
34.	Tha-ret-hmwe, ...	...	....	49	0	Ditto.
35.	Dze-ya-nan-da-thu, ...	....	....	51	0	Ditto.
36.	Tek-ka-thu, ...	....	....	46	0	Ditto.
37.	Lek-kha-na, ...	....	....	37	0	Ditto.
38.	Gun-na-rit, ...	....	...	48	0	Ditto.
39.	Thi-wa-rit, ...	....	....	41	0	Ditto.
40.	Meng-hla-hmwe, ...	....	....	31	0	Ditto.
41.	Ma rin-da,..	....	....	62	0	Ditto.
42	Thi-dhat-kum-ma-ra, ...	....	....	22	0	Ditto.
43.	Meng-hla-kyi, ...	....	....	47	0	Ditto.
44.	Meng-hla-ngay, ...	....	....	24	0	Brother.
45.	Nga-tsa-rit, ...	....	....	38	0	Son.
46.	Myet-hna-wun, ...	...	....	31	0	Ditto.
47.	Let-khut-kyi, ...	....	....	27	0	Ditto.
48.	Thi-ri-kam-ma-thun-da,....	....	....	31	0	Ditto.
49.	Nan-da-ko-ta-bha-ya, ...	....	....	27	0	Ditto.
50.	Meng-nan-hpyu, ...	....	....	20	0	Ditto.
51.	Meng-ma-nu, ...	....	....	28	0	Ditto.

No.	Name of Sovereign.	Date of Accession. B. C.	Date of Accession. Ar. era.	Reign. Yrs.	Reign. Ms.	Relationship of each succeeding Sovereign.
52.	Meng-khoung-ngay, ...	....	....	19	0	Son.
53.	Louk-khoung-ra-dza, ...	....	....	40	0	Ditto.
54.	Meng-ngay-pyau-hla-tsi, ..	....	....	6	0	Ditto.
	Three nobles usurp the throne, ...	....	....	6	8	
	Dhi-ngya-wa-ti second Dynasty.					
1.	Kan-Ra-dza-gyi, ...	825	....	37	0	
2.	Thi-la-Ra-dza, ...	....	....	48	0	Son.
3.	Wa-tsa-thu-ra, ...	....	....	31	0	Ditto.
4.	Nan-da-wi-thu-ra, ...	....	....	40	0	Ditto.
5.	Pun-na-thu-ri-ya, ...	....	....	32	0	Ditto.
6.	Thu-ran-da, ...	....	....	23	0	Ditto
7.	Tsan-di-ma, ...	....	....	37	0	Ditto.
8.	Thi-ri-tsan-da, ...	....	....	40	0	Ditto.
9.	Thi-ha-ran, ...	537	....	46	0	Brother.
10.	Thi-ha-nu, ...	....	....	20		Son.
11.	Pa-ya-ka, ...	....	....	31	0	Ditto.
12.	Ne-la-gun, ...	....	....	41	0	Ditto.
13.	Roha-ha-gun, ...	....	....	31	0	Ditto.
14.	Thi-ri-gun, ...	....	....	24	0	Ditto.
15.	Tha-ma-dza, ...	....	....	35	0	Nephew.
16.	Kum-ma-ra, ...	....	....	20	0	Son.
17.	Thek-hteng-hpyu, ...	....	....	40	0	Ditto.
18.	Tha-bheng-u, ...	....	....	42	0	Ditto.
19.	Te-dza-wun, ...	....	....	36	0	Ditto.
20.	Mun-dza-ya-ba, ...	....	....	34	0	Ditto.
21.	Kum-ma-ra-wi-thud-dhi, ..	....	....	87	0	Ditto.
22.	Wa-thu-mun-da-la, ...	....	....	34	0	Ditto.
23.	Thu-rin-da, ...	....	....	31	0	Ditto.
		A. D.				
24.	Ra-la-ma-yu, ...	15	....	22	0	Brother.
25.	Na-la-ma-yu, ...	37	....	31	0	Son.
26.	Wa-dha-gun, ...	68	....	22	0	Ditto.
27.	Wi-thu-ra-dza, ...	90	....	21	0	Ditto.
28.	Thi-ri-ra-dza, ...	111	....	35	0	Ditto.
	Dhi-ngya-wa-ti Dynasty of the religion of Gau-ta-ma.					
29.	Tsan-da-thu-ri-ya, ...	146	690	52	0	Ditto.
30.	Thu-ri-ya-di-ti, ...	198	....	47	0	Ditto.
31.	Thu-ri-ya-pa-ti-pat, ...	245	....	53	0	Ditto.
32.	Thu-ri-ya-ru-pa, ...	298	....	15	0	Ditto.
33.	Thu-ri-ya-man-da-la, ...	313	....	62	0	Ditto.
34.	Thu-ri-ya-wan-na, ...	375	....	44	0	Ditto.
35.	Thu-ri-ya-na-tha,..	419	....	40	0	Ditto.
36.	Thu-ri-ya-weng-tha, ...	459	....	9	0	Ditto.
37.	Thu-ri-ya-ban-da, ...	468	....	6	0	Ditto.
38.	Thu-ri-ya-ka-lya-na	474	....	18	0	Ditto.
39.	Thu-ri-ya-muk-kha, ...	492	....	21	0	Ditto.
40.	Thu-ri-ya-te-dza,..	513	....	31	0	Ditto.
41.	Thu-ri-ya-pu-nya, ...	544	....	8	0	Ditto.
42.	Thu-ri-ya-ku-la, ...	552	....	23	0	Ditto.
43.	Thu-ri-ya-pa-bas	575	....	25	0	Ditto.
44.	Thu-ri-ya-tsi-tra,..	600	....	18	0	Ditto.

No.	Name of Sovereign.	Date of Accession. A. D.	Ar. era.	Reign. Yrs.	Ms.	Relationship of each succeeding Sovereign.
45.	Thu-ri-ya-the.tha, ...	618	....	22	0	Son.
46.	Thu.ri.ya.wi-ma-la, ...	640	....	8	0	Ditto.
47.	Thu.ri.ya.re.nu, ...	648	....	22	0	Brother.
48.	Thu ri.ya.geng.tha, ...	670	....	16	0	Son.
49.	Thu.ri.ya.thek.ya, ...	686	....	8	0	Paternal Uncle.
50.	Thu.ri.ya.thi.ri, ...	794	....	20	0	Son.
51.	Thu.ri.ya.ke.thi, ...	714	....	9	0	Ditto.
52.	Thu.ri.ya.kut.ta, ...	723	....	23	0	Ditto.
53.	Thu.ri.ya.ke.tu, ...	746	....	42	0	Ditto.
	Dynasty of the city We.tha.li.					
1.	Ma.ha.taing.tsan.dra, ...	788	150	22	0	Ditto.
2.	Thu.ri.ya.taing.tsan.dra, ..	810	172	20	0	Ditto.
3.	Mau.la.taing.tsan.dra, ...	830	192	19	0	Ditto.
4.	Pau.la.taing.tsan.dra, ...	849	211	26	0	Ditto.
5.	Ka.la.taing.tsan.dra, ...	875	237	9	0	Ditto.
6.	Du.la.taing.tsan.dra, ...	884	246	19	0	Ditto.
7.	Thi.ri.taing.tsan.dra.	903	265	32	0	Ditto.
8.	Thing.gha.tha.taing.tsan dra, ...	935	297	16	0	Ditto.
9.	Tsu.la.taing.tsan.dra, ...	951	313	6	0	Ditto.
10.	A.mya.thu, ...	957	319	7	0	A chief of the Myu tribe.
11.	Pai.phyu, ...	964	326	30	0	Nephew.
12.	Nga.meng.nga.tum, ...	994	356	24	0	Son of Tsu.la.taing-tsan-dra.
	Dynasty of Ping.tsa City.					
1.	Khet.ta.theng, ...	1018	380	10	0	Grand Nephew to Tsu.la-taing.tsan.dra.
2.	Tsan.da.theng, ...	1028	390	11	0	Brother.
3.	Meng.reng.phyu,..	1039	401	10	0	Son.
4.	Na.ga.thu.ri.ya, ...	1049	411	3	0	Ditto.
5.	Thu.ri.ya Ra.dza, ...	1052	414	2	0	Ditto.
6.	Pun.na.ka, ...	1054	416	4	0	Ditto.
7.	Meng.phyu.gyi, ...	1058	420	2	0	Ditto.
8.	Tsi.tha.beng, ...	1060	422	1	0	Usurper.
9.	Meng.nan.thu, ...	1061	423	5	0	Son of Meng.phyu.gyi.
10.	Meng.la.de, ...	1066	428	6	0	Son.
11.	Meng.ku.la, ...	1072	434	3	0	Ditto.
12.	Meng-Bhi.lu, ...	1075	437	3	0	Ditto.
13.	Theng.kha.ya, ...	1078	440	14	0	Usurper.
14.	Meng.than, ...	1092	454	8	0	Son.
15.	Meng.pa.di, ...	1100	462	3	0	Ditto.
	Dynasty of the city Pa-rin.					
1.	Let.ya.meng.nau, ...	1103	465	6	0	Grandson of Meng.Bhi.lu.
2.	Thi.ha.ba, ...	1109	471	1	0	Son.
3.	Ra.dza.gyi, ...	1110	472	2	0	Ditto.
4.	Tha.ki.weng.gyi,..	1112	474	3	0	Ditto.
5.	Tha.ki.weng.ngay, ...	1115	477	18	0	Ditto.
6.	Gau.li.ya, ...	1133	495	20	0	Ditto.
7.	Da.tha.Ra.dza,....	1153	515	12	0	Ditto.
8.	A.nan.thi.ri, ...	1165	527	2	0	Ditto.
	Dynasty of the city Khyit.					
1.	Meng.Phun.tsa, ...	1167	529	7	0	Brother.
2.	Pin.tsa.ka.wa, ...	1174	536	2	0	Son.
3.	Gan.na.yu.bau, ...	1176	538	3	0	Ditto.
4.	Tsa.leng.ka.bo, ...	1179	541	1	0	Usurper.

No.	Name of Sovereign.	Date of Succession. A. D.	Ar. era.	Reign. Yrs.	M.	Relationship of each succeeding Sovereign.
	Second Dynasty of the city Ping.tsa.					
1.	Mi.dzu.theng, ...	1180	542	11	0	Son of Pin.tsa.ka.wa.
2.	Nga.ran.man, ...	1191	553	2	0	Son.
3.	Nga.pug.gan, ...	1193	555	2	0	Ditto.
4.	Nga.ra.khoing, ...	1195	557	3	0	Ditto.
5.	Nga.kyun, ...	1198	560	3	0	Ditto.
6.	Nga.tshu, ...	1201	565	4	0	Ditto.
7.	Nga.tswai.theng, ...	1205	567	1	0	Ditto.
8.	Meng.khoung.gyi, ...	1206	568	1	0	Ditto.
9.	Meng.khoung.ngay, ...	1207	569	1	0	Ditto.
10.	Kam.bha.loung.gyi, ...	1208	570	1	0	Ditto.
11.	Kam.bha.loung.ngay, ...	1209	571	1	0	Ditto.
12.	Let.ya.gyi, ...	1210	572	8	0	Ditto.
13.	Let.ya.ngay, ...	1218	580	11	0	Ditio.
14.	Tha.na.beng, ...	1229	591	3	0	Ditto.
15.	Nga.na.thin, ...	1232	594	2	0	Ditto.
16.	Nga.na.lum, ...	1234	596	3	0	Ditto.
	Dynasty of the city Loung-kyet.					
1.	H.lan.ma.phyu, ...	1237	599	6	0	Ditto.
2.	Ra.dza.thu.gyi, ...	1243	605	3	0	Ditto.
3.	Tsau.lu, ...	1246	608	5	0	Ditto.
4.	Uts.tsa.na.gyi, ...	1251	613	9	0	Ditto.
5.	Tsau.mwun.gyi, ...	1260	622	8	0	Ditto.
6.	Nan.kya.gyi, ...	1268	630	4	0	Ditto.
7.	Meng.Bhi.lu, ...	1272	634	4	0	Ditto.
8.	Tsi.tha.beng, ...	1276	638	3	0	Usurper.
9.	Meng.di, ...	1279	641	106	0	Son of Meng.bhi.lu.
10.	Uts.tsa·na.ngay, ...	1385	747	2	0	Son.
11.	Thi.wa.rit,..	1387	749	3	0	Younger brother.
12.	Thin.tse,..	1390	752	4	0	Ditto.
13.	Ra.dza.thu, ...	1394	756	1	0	Son.
14.	Tsi.tha beng, ...	1395	757	2	0	Usurper.
15.	Myin.tsoing.kyi, ...	1397	759	0	5	Ditto.
16.	Ra dza.thu, (restored,)	1397	759	4	0	
17.	Thing.ga.thu, ...	1401	763	3	0	Brother.
	Dynasty of the city Myouk.w.					
1.	Meng.tsau.mwun, ...	1404	766	2	0	Son of Ra.dza.thu.
	Interregnum, ...	....	..	24	0	
	Meng.tsau.mwun restored,..	....	792	4	0	
2.	Men.kha.ri, ...	1434	796	25	0	Brother.
3.	Ba.tsau.phyu, ...	1459	821	23	0	Son.
4.	Dau.lya, ...	1482	844	10	0	Ditto.
5.	Ba.tsau.ngyo, ...	1492	854	2	0	Uncle a son of Meng.khari.
6.	Ran.oung, ...	1494	856	..	6	Son of Dau.lya.
7.	Tsa.leng.ga.thu, ...	1494	856	7	0	Uncle by the mother's side.
8.	Meng.ra.dza.	1501	863	22	0	Son.
9.	Ga.dza.ba.di, ...	1523	885	2	0	Ditto.
10.	Meng.tsau.o, ...	1525	887	..	6	Brother toTsa.leng.ga.thu.
11.	Tha.tsa.ta, ...	1525	887	6	0	Son of Dau.lya.
12.	Meng.beng, ...	1531	893	22	0	Son of Men.Ra.dza.
13	Dik.kha, ...	1553	915	2	6	Son.

No.	Name of Sovereign.	Date of Succession. A. D.	Ar. era.	Reign. Yrs.	M.	Relationship of each succeeding Sovereign.
14.	Tsau.lha, ...	1555	917	9	0	Son.
15.	Meng.Tsek.ya, ...	1564	926	7	0	Brother.
16.	Meng.Tha.loung, ...	1571	933	22	0	Son of Meng.beng.
17.	Meng.Ka.dza.gyi, ...	1593	955	19	0	Son.
18.	Meng.Kha.moung, ...	1612	974	10	0	Ditto.
19.	Thi.ri thu.dham.ma, ...	1622	984	16	0	Ditto.
20.	Meng.Tsa.ni, ...	1638	1000	..	..	Son reigned only 28 days.
21.	Na.ra.ba.di.gyi, ...	1638	1000	7	0	Great grandson of No. 11 Tha.tsa.ta.
22.	Tha.do, ...	1645	1007	7	0	Brother's son.
23.	Tsan.da.thu.dham.ma, ...	1652	1014	32	0	Son.
24.	Nau.ra.hta.dzau, ...	1684	1046	1	0	Ditto.
25.	Thi.ri.thu.ri.ya, ...	1685	1047	7	0	Brother.
26.	Wa.ra.dham.ma.ra.dza, ...	1692	1054	2	0	Ditto.
27.	Mu.ni·thu, ...	1694	1056	2	0	Ditto.
28.	Tsan.da.thu.ri.ya, ...	1696	1058	..	..	Son reigned eleven days.
29	Ma.yup.pi.ya, ...	1696	1058	1	0	Usurper.
30.	Ka.la.man.dat, ...	1697	1059	1	0	Ditto.
31.	Na.ra.dhi.badi, ...	1698	1060	2	0	A supposed son of No. 27. Tsan.da thu.ri.ya.
32.	Tsan.da.wi.ma.la, ...	1700	1062	6	0	Son of Meng.rai.kyan-tswa who was a son of No. 22 Tha.do.
33.	Thu.ri.ya, ...	1706	1068	4	0	A son Rai.bhau.thi.ha, who was a son of No. 23 Tsan.da.thu.dham.ma.
34.	Tsan.da.wi.dza.ya, ...	1710	1072	21	0	Usurper.
35.	Thu.ri.ya, ...	1731	1093	3	0	Son.in.law.
36.	Na.ra.dhi.ba.di, ...	1734	1096	1	0	Son.
37.	Na.ra.pa.wa.ra, ...	1735	1097	2	0	Usurper.
38.	Tsan.da.wi.dza.la, ...	1737	1099	8	0	Cousin.
39.	Ka.tya, ...	....	....	..	..	A foreigner reigned for three days.
40.	Mad.da.rit, ...	1737	1099	5	0	Brother to No. 38.
41.	Na.ra.a.pa.ya, ...	1742	1104	19	0	Uncle.
42.	Thi.ri.thu, ...	1761	1123	..	3	Son.
43.	Pa.ra.ma.Ra.dza, ...	1761	1123	3	0	Brother.
44.	Ma.ha.Ra.dza, ...	1764	1126	9	4	Brother.in.law.
45.	Thu.ma.na, ...	1773	1135	4	0	Ditto.
46.	Tsan.da.wi.ma.la, ...	1777	1139	..	..	Usurper reigned forty days.
47.	Tha.di.tha.dhamma.yit, ...	1777	1139	5	0	A chief from Ram.byi.
48.	Tha.ma.da, ...	1782	1144	2	0	A chief, in whose reign the Burmese conquered the country.

Note.—In the above list of Arakanese Sovereigns several discrepancies will be observed, if it be compared with Mr. Paton's table, published in the 16th Vol. of the Asiatic Researches, p. 380. Some of these discrepancies however are only apparent, arising 1st from a difference of the mode of spelling. Mr. Paton has adopted an orthography consistent with the pronunciation of the people of Arakan proper; where, though the letters of the alphabet are precisely the same as those current among the whole Burman race, yet the powers of the letters, and the sounds of the inherent vowels are sometimes different. I have spelt, according to the Burmese pronuncia-

tion. 2d Discrepancies arise from evident misprints in Mr. Paton's list. 3d Different names are applied to the same individuals among the later Arakanese kings.

After the time of *Meng Tsau-mwun* when they became for a time tributary to Bengal, and later still when they ruled over the present Chittagong district, they assumed foreign names, and their Bengal subjects distinguished them by Indian names and titles, which are now frequently applied to them, though the same Indian names are not always applied to the same individual kings, even by the best informed among the Arakanese. Hence arises confusion, the dates in Mr. Paton's list refer to the death or deposition of the sovereigns opposite to whose names they are placed, the dates in the foregoing list refer to the accession of each sovereign. As an illustration of these remarks, I here subjoin a comparison of a few of the names from the two tables.

Paton's list.	*Same as.*	*Remarks.*
74. Ju.mu.wai, ...	Meng.tsau.mwun, ..	No. 1, of the dynasty of Myouk-au. In this name *Meng* is an honorary prefix. *Tsau-mwun* if written according to the pronunciation of Arakan proper would be *Cho-ma-in* or *Cho-mwa-in*, for which Jumuwai is evidently intended.
75. Mong Bhung Raja.		This is the name of the king of Ava who deposed *Tsau.mwun;* and the period of whose deposition I have marked as an interregnum.
76. Ali khang, ...	Meng.kha.ri, ...	*Ali kheng*, is the foreign name given to this king, *khang* is the Arakanese pronuciation of *kheng*.
77. Kala shama, ...	Ba.tsau.phya, ...	*Kalamasha* is the foreign name of this king.
	Dau.lya, ...	No. 4, of the above list, is omitted in Mr. P's. table.
78. Jaru, ...	Ba.tsau.ngyo, ..	I cannot satisfactorily account for the difference in these names.
79. Manikra Bong, ...	Ran.oung, ...	These names refer to the same individual, *Manik* in Mr. P's. list is a misprint for *Meng* the honorary title, *ra* is for *Ran; Bong* is an error in copying for *oung*, as the Burmese letters are easily mistaken. There is no use pursuing this comparison further.

Bháscaræ Acháryæ Siddhánta Shirómáni sic dicti operis pars tertia, Gunitadhiam, sive astronomiam continens, Latine vertit notasque adjecit E. Roer.

Caput I.—Rationes Temporis Computandi.

1. Unus ille Sol, ob permagnum in homines amorem radiis suis res, caligine obrutas, nec non summum verum (Bramham) devotorum, perpetuâ veri contemplatione in mente purificatorum, manifestans, per mundum imperat.

2. Eodem modo ob permagnum in pueros amorem in disciplinâ, per me confectâ, definitiones verborum obscurorum ejus (Solis) favore manifestabo, ita ut üs, memoriâ in vero adipiscendo perpetuo exercitâ, veri sensus perceptio obtingat.

3. Sphaerae ignarus scientiâ, demonstratione stabilitâ, non fruitur; quam ob rem omnes notiones difficiles, ad sphaeram pertinentes, primo definiendae sunt.

4. Unus ille Sol, dïis venerandus, loti socius, qui caliginem destruens omnia humilium crimina funditus abluit, quôque ad mundum servandum orto, sacrificia incipiuntur, cœlicolaeque, Indrâ praecedente, in cœlo ludunt, verbum nostrum, bene conceptum, cito manifestet.

5. In astronomorum circulo doctus Jishnuis filius veluti frontis gemma splendet; splendent facundi Barahas, Mihiras aliique, qui praeclaras propositiones in ipsorum scriptis astronomicis protulerunt.

6. Doctus Bhascaras, magistri pedes, loto similes, veneratione adorans, indeque intellectus particulam hauriens, eo consilio, ut illustribus astronomis gratus sit, scripit hoc Siddhantasirómani, quod, sapientium mentem delectaturum, elegantibus metris præditum, suavibus dictis abundat, purificatum et haud difficile intellectu est.

7. Quanquam per priores (astronomos) opera, ingeniosorum dictorum plena, composita sunt, tamen mihi, eorum dictis explanationes uberiores profituro, incipiendum erit: his (explan. uber.) passim pro opportunitate exhibitis, astronomi benevolenti totum meum opus perlegant oportet.

8. Boni æque ac pravi viri, illi, materias a me prolatas intelligentes, hi non intelligendo me irridentes, gratificationem inibunt.

9. In hâc astronomicarum disciplinarum principe parte Siddhantae nomine ea a sapientibus ornata est, quae metiendi temporis discrimina, a Truti, sic dictâ, usque ad mundi conflagrationem elapsi, gradatimque coelestium corporum motus et duplicem calculum, dein quaestiones et responsiones ac explanationem positionis terræ, Jovis, planetarum, instrumenta etc. definit.

10. Is etiam, qui novit versuum collectiones, nativitatis calculos docentium, minimam sane sublimioris astronomiæ partem, nullo modo quæstionibus, in argumentationibus astronomicis difficilioribus, recta responsa reddere valet; quicunque Siddhantam, inumeris conclusionibus progredientem, non intelligit, regi picto, seu tigri, e ligno bene fabricatæ, similis est.

11. Ut regius exercitus, elephanti mugitu sive equis etc. privatus, ut hortus Chuta arbore (Mango) orbatus, ut lacus, aquâ vacuus, ut femina, novo marito procul perigrinante, non splendet, ita sapientes astronomiæ institutiones, Siddhantæ orbatas, æstimarunt.

12. Omnes Vedæ sacrificiorum caeremoniarum gratiâ institutæ sunt; hæ autem tempori inserviunt, ideoque astronomiæ disciplina, quippe quæ tempus definiat, Vedæ pars dicenda est.

13. Literarum scientia, Vedæ os, astronomia oculus, Niructa (explanatio obscurorum Vedarum terminorum) aures, Calpa (quâ ritus religiosi describuntur) manus, Sicsha (qua vocalium pronuntiato explanatur) Vedae nares, Chanda (ars metrica) pedes a prioribus sapientibus dicta sunt.

14. Astronomia sane veluti Vedae oculus recordanda est, ideoque ei princeps inter Angas (partes) locus assignatur; quid enim homo, ceteris sensibus instructus, at oculi parte orbatus, efficere potest.

15. Quapropter summum illud verum, purum et secretum, Brahmanis (bis natis) discendum est. Quicunque astronomiam bene noscit, is omnino virtutis, divitiarum et desideriorum fructus, necnon gloriam nanciscetur.

16. Bramha creator quum creavisset hanc sphæram cœlestim una cum planetis, in Zodiaci initio* collocatis, quo perpetuo revolvantur, duas stellas polares immobiles fixit.

* Zodiaci initium est in Asvinis.

17. Dein sphærâ cœlesti una cum planetis occidentem versus celeratiori motu progrediente, planetæ tardiori motu suis orbitis alterioribus et inferioribus orientem versus moventur.*

18. Super Lancæ urbem Sole ipsius die orto, uno temporis momento origo mensis Chaitrae, primi diei novæ Lunæ, dierum (solarium) mensium, annorum, Yugarum, etc. fuit.†

19. Nictationis oculi trigesima pars Tatpara, ejus (Tatp.) centesima Truti dicta est; duodeviginti nictationes Cashta, 30 Cashtae Cala ab astronomis dicuntur.

20. 30 Calae sunt hora (Ghatica) siderea, 30 horae sidereae dies; decem longae literae Ashu (expiratio et inspiratio,) sexaginta Ashues Pala, 60 Palae Ghatica sunt.

21. 60 Ghaticae dies, 30 dies mensis, 12 mensis annus; eodem modo Zodiacus in aequales partes, viz. in Rashi, Ansas, Calas, etc. divisus est.‡

22. Solis Zodiaci descriptio annus dicitur, idemque deorum et Asurarum dies et nox. A conjunctione Solis et Lunae usque ad alteram conjunctionem mensis lunaris, idemque dies atque nox majorum nostrorum est.

23. Intervallum inter duos Solis ortus dies civilis unaque orbis terrarum dies, Zodiaci revolutio dies sidereus est.

24. Annis solaribus 432000 gradatim per 4. 3. 2. 1. multiplicatis, Yugæ quatuor pedes invenies.§

* Commentator, quo, nos, ordine inferiores ac superiores planetas enumerans (scil. Luna, Mercurius, Venus, Sol, Mars, Jupiter, Saturnus,) his omnibus altiorem ideoque eas comprehendentem sphæram esse cœlestim, quam Latini universalem dixerunt, autumnat. Hæc vero sphæra vento, Prabaha vocato, atque occidentem versus flante, circumagitur.

† In commentario de temporis origine uberior sermo est; asseritur, temporis limites esse in infinito Brahma, in quo, quia Sol ceteraque corpora non sint, tempus definiri non posse, hoc destructio dicta, seu non æterna destructio.

‡

Annus, ... = 12 Menses.	Nimesha,.. .. = 30 Tatparæ.
Mensis, ... = 30 Dies.	Tatparah, .. = 100 Truti.
Dies, ... = 60 Ghaticae.	Chacra (circulus,) = 12 Rashi.
Ghatica, ... = 60 Calae.	Rashi,.. .. .. = 30 Anshæ.
Cala,.. .. .. = 60 Cashtae.	Ansha, ... = 60 Calae.
Cashta, ... = 18 Nimesæ.	Cala, ... = 60 Bicalae.

§

Crita Yuga = 1728000.	Crita Yugae Crepuscula = $\frac{1728000}{12} \times 2 = 292000$
Treta .. .. = 1296000.	Treta, ... = $\frac{1296000}{12} \times 2 = 216000$
Dwapara .. = 864000.	Dwapara, ... = $\frac{864000}{12} \times 2 = 144000$
Cali, ... = 432000.	Cali, ... = $\frac{432000}{12} \times 2 = 72000$
Maha Yuga ..= 4320000.	

25. Si Yugæ pedibus ipsarum duodecimae partes initio et fine addantur, Yuga (4320000 anni) reperitur.

26. Manuis aetas 71 Yugas amplectitur, 14 Manuis aetatibus Bramhae dies, eodemque tempore ejus nox metitur.

27. Manuum crepuscula in initio, medio et fine eadem sunt ac anni Crita Yugae ;* millia Yugarum una cum illis (annis Critae) Bramhae dies est, qui Calpa dicitur, ideoque (Bramhae) dies atque nox duae Calpae sunt.

28. Qui centum annos degere in sacris libris dicitur, ejus Satanandae (Bramhae) aetas a prioribus Mahacalpa nominata est ; hoc tempore initio carente, equidem haud scio, quot Bramhae anni elapsi sint.

29. Alii præsentis Bramhae aetatis dimidium, alii dimidium, additis octo annis, elapsum esse, censent ;† quod etiamsi demonstrari possit, verumtamen inde fructus non hauritur; planetarum positio secundum tempus praesentis (Bramhae) diei praeterlapsum determinanda est.

30. Bramhae diei initio illae creantur, ejusque fine destruuntur, ideoque planetarum motus, dum praesentes sunt, computari possunt ; viris autem magnanimis, qui earum motus, inmo dum non adsunt, computari posse prae se ferunt, salutationem meam.

31. Six Manues, 27 Yugae et Shacae rege mortuo Cali Yugae 3179

* Manuis aetas $= 4320000 \times 71 + 1728000 = 308448000$

† 2. Calpae $= 308448000 \times 14 + 1728000 = 4320000000$, viz.

Cali Yuga, ..	$= \frac{4320000}{10} \times 1 =$	432000
Dwapara, ..	$= \frac{4320000}{10} \times 2 =$	864000
Treta, ..	$= \frac{4320000}{10} \times 3 =$	1296000
Satya, ..	$= \frac{4320000}{10} \times 4 =$	1725000
		4320000
Multiplicetur per	71, ...	3024
71 Yugae, ...	=	306720000
Sandhi=Satya, ...	=	1728000
Manuis ætas, ...	=	308448000
Multiplicetur per	14, ..	= 1233792000
		4318272000
Sandhi, ...	=	1728000
Calpa, ...	=	4320000000

anni, ideoque una cum Shacae regis annis Bramhae diei praesentis 1972947179 anni praeterlapsi sunt.*

32. Primus Manu Svayambhuba erat; deinde Suârochisa, Uttamaja, Támarasa Manues fuerunt; sextus Chaksusae nomine per mundum celebratur; post illos hâc aetate Baibasvata Manuis locum tenet.

33. Sphaericorum scriptores Jovem in mediâ Rashi (in uno Zodiaci signo) per totum annum morari statuunt; homines tempora varie computant, quippe vitae regulandae gratia quatuor methodis utuntur.

34. Anni, periodi aequinoctiales et anni tempora secundum tempus solare, dies lunares secundum tempus lunare, ritus religiosi, omniaque quae ad morbos curandos et dies enumerandos pertinent, secundum tempus civile, horae etc. secundum tempus siderale computantur.

35. Novem igitur temporis metiendi rationes, scil. (Manuum, deorum, Jovis, majorum nostrorum, siderum, Solis, Lunae, computationis civilis et Bramhae) descriptae sunt; planetae vero suâ ipsarum normâ computentur necesse est.

II.—Planetarum Revolutiones.

1. Uno Bramhae die labente, Solis, Veneris et Mercurii 43200000000 revolutiones sunt, eundemque revolutionum Apsidum numerum astronomi Saturno, Jovi Martique assignant.

2-4. Lunae 57753300000, Martis 2296828522, Mercurii 1793698984, Jovis 364226455, Veneris 7022389492 revolutiones celeriores, Saturni 146567298 revolutiones esse affirmantur.

5-6. Solis apsidum revolutiones 450, Lunae 488105858, Martis 292, Mercurii 332, Jovis 855, Veneris 653, Saturni 41, Orientem

* 1 Sandhya, ...	1728000
6 Manues, ...	1850688000
27 Maha Yugæ, ...	116640000
Shatya Yuga, ...	1728000
Dwapya Yuga, ...	1296000
Treta Yuga, ...	864000
Cali Yugæ, ...	3179
	1972947179

versus, revolutiones nodorum Lunae 23231168, Martis 267, Mercurii 521, Jovis 63, Veneris 893, Saturni 594 statuuntur.*

7-9. Bramhae die 158223645000 sphaerae revolutiones occidentem versus, eodemque temporis spatio Solis 1555200000000, Lunae 1602999000000, et 1577916450000 dies civiles sunt.†

10. Calpae spatio 1593300000 menses lunares intercalares, eodemque tempore 25082550000 dies lunares expungendi a sapientibus statuuntur.‡

11. 51340000000 mensibus solaribus a 53433300000 mensibus lunaribus, subtractis numerus mensium intercalarium Calpae spatio exhibetur.

12. E diebus solaribus una cum diebus intercalaribus numerus dierum lunarium, et e diebus lunaribus, diebus expungendis subtractis, numerus dierum civilium invenitur.§

* *In subjunctâ tabulâ præcedentes valores exhibentur.*

Planetæ.	Revolutiones.	Rev. Apsidum.	Rev. Nodorum.
Sol, ...	43200000000	450	
Luna, ...	57753300000	488105858	232311165
Mercurius, ...	1793698984	292	263
Venus, ...	7022389492	332	521
Mars,..	2296828522	855	63
Jupiter, ...	364226455	653	893
Saturnus, ...	146567298	51	584

† Anni spatio Solis revolutiones diurnæ, $= \frac{1577916450000}{4320000000} = 365.\ 15.\ 30.\ 22.\ 30.$

———— Sphæræ ————, $= \frac{1581223645000}{4320000000} = 366.\ 15.\ 30.\ 27.\ 30.$

Mensis lunaris,.. .. .. .. $= \frac{1577916450000}{57753300000} = 27.\ 18.\ 46.\ 25.$

‡ Yugæ spatio menses lunares, .. = 57753300000
— 4320000000
5343330000

———— intercalares, .. = 5343300000
— 51340000000
1593300000

§ Dies Solar. .. .. = 155520000000
Dies Lun. Interc. .. .. = 4779900000
Dies Lun... .. .. = 1602999000000
— 25082550000
Dies Civil. .. .. = 1577916450000

13. E differentiâ inter Solis et Lunae revolutiones numerum mensium lunarium reperies. Diebus sideralibus a numero dierum lunarium subtractis, quot dies expungendi sint, videbis.*

14. Subtrahendo Solis revolutiones, per 13 multiplicatas, a Lunae revolutionibus, mensesi ntercalares reperiuntur. Differentia inter planetarum apsidum revolutiones addita, revolutiones argumenti anomaliae exhibet.

III.—Ahargana.

1-3.—Annis solaribus, Calpæ spatio præterlapsis, per 12 multiplicatis, menses anni currentis addantur ; summa, per 30 multiplicata, additis diebus lunaribus, separatim ponatur; hoc numero, per 1593300000 menses intercalres multiplicato, et per 1555200000000 dies solares diviso, menses intercalcares Aharganæ solaris inveniuntur ; dein his mensibus intercalaribus, in dies conversis, ad numerum separatim positum (Aharganam solarem) additis, dierum lunarium numerus innotescet; hic separatim ponatur, dein multiplicetur per 25082550000, dies lunares expungendos, et dividatur per 160299900000, dies lunares, quo facto dies periodi expungendi inveniuntur ; his a numero dierum lunarium (separatim posito) subtractis, numerus dierum mediorum solarium civilium datur. Residuum mensium intercalarium et dierum lunarium expungendorum in computandâ Aharganâ haud respicitur.†

4. Numero dierum (Ahargana) per planetæ revolutines multiplicato, et per dies civiles diviso, media in Zodiaco planetæ positio, gradibus,

* Revolut. Lunæ, ...	=	5775300000
Revolut. Sol.	=	432000000
Menses Lun.	=	53433300000
Dies Lunares, ...	=	1602999000000
Dies Sideral.*	=	158236450000
Dies Expung.	=	20762550000

† 1. Methodus Aharganæ computandæ haec est:

Annis, Calpæ spatio præterlapsis, in dies conversis, dies anni currentis addantur, quo facto numerus dierum solarium (Ahargana solaris) datur. Numerus dierum intercalarium addendus est; hâc via regulâtrium terminorum inveniuntur : Calpæ spatio si x menses intercalares erant, quot menses intercalares annis præterlapsis. His mensibus intercalaribus Aharganæ solari additis, Ahargana lunaris proditur, de qua dies expungendi deducendi sunt. Hoc modo eos invenias: Si Calpæ spatio x dies expungendi, Ahargana solari quot.

His ab Aharganâ solari subtractis, numerus dierum solarium civilium exhibetur. Exempli gratia Ahargana 27mæ. Chaitræ anni Shacæ regis 1764 (A. D. 8 vi. Apr. 1844) inveniatur.

I. Anni

etc. determinata, proditur, dum Sol medius in Luncæ urbe Marti vicinum locum tenet.

5. Residuo* dierum expungendorum, per 131490000000† diviso, gradus minuta, etc. dantur; cui dies lunares, per 12 multiplicati, si addantur, Lunæ positio, si subtrahantur, Solis positio exhibetur.

6. Residuo dierum expungendorum, per 2711 0000000 diviso, Calæ, etc. producuntur, quod Solis Dhana (plus) nominatur; idemque, per 13 multiplicatum, trigesimâ quintâ ipsius parte additâ, Luna Suá dicitur. Dies lunares, a Chaitra mensi etc. elapsi, per 13 multiplicati, Solis et Lunæ Ansæ sunt. Numerus, qui e divisione reliquarum mensium intercalarium et mensium lunarium producitur, si subtrahatur, Suá, si addatur, Dhana est.

7-8. Dies solares civiles per planetæ dies civiles, Calpæ spatio præterlapsos, multiplicentur, et per 131493037500 dividentur; quo facto Rashi (Zodiaci signa) producuntur; inde signis, quae Sol tenet, deductis, planetae positio in Zodiaco determinatur. Docti autem aliis quoque methodis uti pollent.

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1. Anni elapsi acreatione usque ad Shacam regem,.. 1972947179
——— a Shacarege ad 27 men. Chaitr. 1764, ... 1764
1972948943
multiplicentur per × 12
23675387316
addantur,.. .. 11
2. Menses Solares, ... 23675387327
multiplicentur per × 30
710261619810
addantur,.. .. 27
3. Dies Solares,.... 710261619837

Addantur menses intercalares, in dies conversi:
15552000,00000: 15933300000: 710261619037
Dies Calpæ Sol. Mens. Calpæ Interc.

$$= \frac{15933300000 \times 71261619837}{15552000,00000} = 727661933$$

.... 710261619837
Dies Intercalares = 7272661933 × 30 = ... 21829857990
4. Dies Lunares, ... = ... 732091477827

Deducentur dies expungendi.
1602949000000: 25082550000: 732091477827
Dies Calpæ Lun. Dies Calpæ Exp. Aharg. Lun.

$$\frac{2508255000 + 732091477827}{1602999000000} =$$

732091477827
—11455229290
720636248537

5. Dies Solares Civiles præterlapsi, =

* Vid. versum tertium; residuum dierum expungendorum loco citato non receptum erat.

† 1577916450000: Residum, D. E. × 12 = $\frac{\text{Resid. D. E.}}{131490000000}$

9-10. Ut planetarum revolutiones e mensibus lunaribus, intercalaribus et expungendis, vicissim additis et subtractis, inveniuntur, ita regulâ trium terminorum, e Solis diebus civilibus, subtractis et additis, inveniuntur.

11. Differentia positionis planetæ, duas revolutiones transgressæ, addatur, dein subtrahatur; summa superiorem, differentia inferiorem Apsidem indicat.

12. Differentia inter duas planetae revolutiones subtracta, Adruta, sive inferior, eademque addita, superior Apsis est.

13. Planetâ a Superiori Apside subtractâ, ejus anomalia media (distantia Solis a superiori Apside) invenitur, anomaliâ mediâ subtractâ, planetae positio datur.

14. Planetae revolutiones una cum gradibus, minutis, per dies civiles multiplicentur, dein per ejus Calpae revolutiones dividantur, quotus Ahargana est.

15-16. Dies civiles elapsi per dies expungendos multiplicentur, dein per dies civiles* dividantur; quofacto dies expungendi praeterlapsi inveniuntur; his Aharganæ additis, numerum dierum lunarium perspicias; hic numerus separatim ponatur, per menses intercalares multplicetur, et per dies lunares dividatur; quotus menses intercalares elapsos praebet, quos in dies conversos, si de diebus lunaribus deducas, numerus dierum solarium invenitur; his, per 30 divisis, numerus mensium, et postremo, per 12 divisis, annorum Calpae spatio invenitur.†

17. Dierum numerus a Cali Yugae initio praeterlapsorum, a die Veneris computandus est; si planeta hôc dierum numero determinata, ipsius positioni initii Cali Yugae addatur, planeta anni regens invenitur.

18-19. Initio Cali Yugae Martis ceterarumque planetarum locus in Zodiaco, Solisque et Lunae superior apsis, et Lunæ nodus, Bicalis determinata, talis erat 3370,1944, 4666,4406, 1016064, 844214, 744422.‡

* Calpae spatio clapsos.

† Calculationis methodus est reversa No. 1-3 quos vide.

‡ Hi valores de gradibus Zodiaci deducendi sunt: exampli gratia Martis locus erat 3370 Bicalae=56′ 10″

12. 30. 60. 60
56. 10
11 R. 30 As. 3 C. 50 Bs. Martis positio.

Mars.	Merc.	Jov.	Ven.	Sat.	S. A. S.	L. A. S.	L. N.
11	11	11	11	11	2	4	5
29	27	29	28	28	17	5	3
3	24	27	42	46	45	29	12
50	29	36	14	34	36	46	48

Caput IV.—Planetarum Orbitae.

1. Astronomiae periti globi cœlestis circumferentiam 18712069-200000000 Yajanis circumscribi affirmant; alii hanc Bramhæ ovi circumferentiam esse, alii, Puranorum gnari, hanc distantiam inter clarum et obscurum montem esse contendunt.

2. Quicunque circuli qualitates clare sciunt, sphaerae circumferentiam, quâ Solis radii obscuritatem destruunt, cognoverunt.

3. Num Bramhae ovum illius magnitudinis sit necne, non quaeritur. Veteres quidem, quot Yajanos planetae Calpae spatio percurrerent, computando, Planetarum orbitas definiebant, haec nostra opinio.

4. E sphaerae circumferentiâ, per planetarum revolutiones (Calpae tempore) divisâ, earum orbitae inveniuntur; in suâ ipsius orbitâ planeta Yajanos, sphaerae circumferentiâ definitas, in perpetuum revolvitur.

5. Astronomi Solis orbitam 4331397½, Lunae 324000, Zodiaci circumferentiam 259889850 Yajanos esse affirmant.*

6. Sphaeræ circumferentiâ, per Calpæ dies civiles divisâ, planetae motus diurnus invenitur; planetae 11858¾ Yujanos, per suas orbitas quotidie moventur.†

7. Ahargana, per 9921 multiplicata et per 25419 divisa, de Ahargaṇâ per 11859 multiplicatâ deducatur, quo facto, Yajani planetae praeterlapsi remanent.

* Sol $= \frac{187120692000,000,00}{432000,0000} = 4331497\frac{1}{2}$

Luna $= \frac{1871\ \ldots}{57753300000} = 324000$

Zodiacus $= \frac{1871\ \ldots}{72000000} = 259889850$

† Planetarum Motus Diurnus $= \frac{1871\ \ldots}{157791645} = 11858\frac{3}{4}$

8. In planetarum orbitis computandis apsidem et nodum non respicies; at Solis orbitam ejusdem magnitudinis esse censent ac Mercurii et Veneris orbitas; quare in iis computandis orbita apsidis et nodi secundum Solis motum fundamento erit.

V.—Planeta, anni regens.

1.—Numerus annorum, Calpae spatio elapsorum, separatim per 2, 4, 3 multiplicetur; producta per 8 dividentur, quo facto dies, Dandae, etc. inveniuntur; his annorum numero additis, Sole praecedente, planeta, anni regens, reperitur.*

2. Ex annis Calpae praeterlapsis, separatim 4,120 et 9,600 divisis, dies, Dandae, etc. fiunt.†

3. Anni (Calpae) una cum suâ ipsorum sexagesimâ parte, addantur annis, per 30 multiplicatis et per 160 divisis; numerus, sic ortus, ab annis elapsis subtrahatur; quo facto dies expungendi inveniuntur.‡

4. Dies, etc. per 3 multiplicentur, sua ipsorum 400ma. pars subtrahetur, quo facto 30mae. annorum parti addentur.§

* Annus sol. civ. = 365. 15. 30. 22. 30. — 0.15. 30. 22. 30 quodsi per 8 multiplicetur, 2 ds. 4 dae. 3 Ansæ producuntur, quare si Ahargana gradatim 2, 3, 4 multiplicetur, per 8 dividatur oportet; dies remanentes, per 7 divisi, anni regentem exhibent.

† 15 Dandae $\times$ 4 = 1 dies $\frac{120}{2}$ Dandae = 1 dies.

$\frac{216000}{22\frac{1}{2}}$ Calae = 9600 Calae = 1 dies.

‡ Calpae Annis. D. Expung. 4320000000 : 25088550000 : 1.

Anni D. E = 5. 48. 22. 7. 30.—5 diebus neglectis, 48 dandis, etc. de unitate deductis, remanet 0. 11. 27. 52. 30. quo per 160 multiplicato, 31 dies 1 danda producuntur, quo facto haec proportio datur:

160 A : 31 dies. 1 danda : A. E. 1 danda = $\frac{1}{60}$ dies. His valoribus substitutis.

$$\text{D. E.} = \text{A. E.} - \left(\text{A. C.} \times \frac{\text{A. C.}}{60} \times 30. \frac{\text{A. C.}}{160}\right).$$

§ Unius anni dies etc. = 0. 15. 30. 22. 30.

——— dies expung. = 0. 48. 22. 7. 30.

Diebus etc. per 3 multiplicatis, de d. E. subtractis, remanet 10. 1. 52.

quadsi diebus etc. addatur, D. E. inveniuntur.

$$0.\ 1.\ 52 \times 1200 = 37.$$

Quo facto haec aequatio datur.

$$\frac{\text{A. E.}}{1200} \times 37 + 15.\ 30.\ \ldots. \times 3 = \text{D. E.}$$

sed $37 = 40 - 3$.

$\frac{40}{1200} = \frac{1}{30}$ $\frac{3}{1200} = \frac{1}{400}$.

5. Annus, suâ ipsius 60ma parte subtractâ, per 160 dividatur; dein ab anno sua ipsius quinta pars subtrahatur, utroque numero juncto, dies expungendi inveniuntur.*

6. Dies, Dandae, etc. una cum diebus expungendis, addantur annis, per 10 multiplicatis and per 30 divisis, quo facto menses intercalares inveniuntur; residuum, a quo dies interpungendi, Dandae, etc. subtrahantur, Suddhi dicitur.†

7. Anni separatim per divisores 32 at 30 dividantur; utroque numero juncto, anni, per 11 multiplicati et per 30 divisi, addantur, unde menses intercalares producuntur; residuum, subtractis diebus expungendis, Dandis, etc. Suddhi dicitur.‡

8. Differentia inter menses intercalares et annos elapsos, per 2 multiplicata, addatur diebus expungendis elapsis, per 7 divisis; de quo Shuddhi deducta et per 7 diviso, quem tali modo invenies numerum, anni regens, Soli praecedente, est.

9. Si reliquae mensium intercalarium Dandæ, etc. de Dandis, etc. priorum dierum deducuntur, Dandæ, etc. reliquorum dierum expungendorum inveniuntur.

* Unius Anni D. E. = 0. 48. 22. 7. 30.

48 d. $= \left(\frac{1}{60} - \frac{1}{5}\right)$ d.. (ies.)

remanet 0. 0. 22. 7. 30.

$\left(0.\ 0.\ 22.\ 7.\ 30\right) \times 160 = 0.\ 59 = 1.\text{d.} - \frac{1}{60}$ da.

$\text{D. E.} = \left(\text{A E.} - \frac{\text{A E}}{60}\right) : 160 + \left(\text{A. E.} - \frac{\text{A E}}{5}\right)$

† Unius anni D. C. = 365. 15. 30. 22. 30.
——— D. E. = 0. 48. 22. 7. 30.
——— D. L. = 371. 7. 52. 30.
——— D. I. = 11. 3. 52. 30.

$\text{M. I.} = \frac{\text{AE} + 10 + \ldots\ldots}{30}$

‡ Unius anni D. E. = 11. 3. 52. 30.
= 11 + 0. 3. 52. 30.
(0. 3. 52. 30) × 480 = 31d.
31 = 16 + 15.
$\frac{480}{16} = 30.$ $\frac{480}{15} = 32.$

His valoribus substitutis.

$$\text{M. I.} = \frac{\left(\frac{\text{A. E.}}{16} + \frac{\text{A. E.}}{15} + \text{A. E} \times 11.\right)}{30}$$

10. Si anni elapsi per planetarum revolutiones, Calpae spatio elapsas, multiplicentur et per Calpae annos dividantur, revolutiones, etc. nodorum, apsidum et planetarum, fine revolutionis solaris determinantur.

11. Mensium intercalarium diebus reliquis, etc. per 12 multiplicatis, Lunae locus in Zodiaco, signis, gradibus, minutis, etc. definita, determinatur.

12. Diebus, etc. supra dictis, pro Cali Yugae annis elapsis computatis, anni regens a die Veneris calculandus est, et planetarum loci fixi locis, quos initio Cali Yugae tenebant, addendi sunt.

13. Dandis, etc. suae ipsarum 20mae parti junctis, dies in computandâ Aharganâ addendi inveniuntur.

14. De diebus lunaribus, a Chaitra mensi ante Idus elapsis, Shuddes deducantur, residui 702da pars addatur, et per 64 dividatur; quotus a diebus expungendis subtrahatur, quo facto, Ahargana anni regentis invenitur.

15. A quibus diebus lunaribus Shuddhi non subtracta est, eorum Ahargana Chaitra mensi prior computanda est; planetae, locis prioris anni additis, secundum Shuddhim antea determinatam computentur oportet.

16. 60mâ parte de Aharganâ deductâ, Solis locus una cum gradibus definitus est. Aharganâ, per 3 multiplicatâ, et per 22 divisâ, Calae, Bicalae, etc. inveniuntur.*

17. Soli una cum gradibus, separatim posito, si dies lunares, per 12 multiplicati, addantur, Luna determinatur; sin autem dies expungendi, per 10 multiplicati, de Sole, 7mâ ipsius parte additâ, deducantur, Luna unacum Calis invenitur.

18. Aharganae dimidium per 3 multiplicetur, 17ma ipsius pars subtrahatur; additâ Martis positione fixâ una cum gradibus, minutis, etc. Mars invenitur.

19. Ahargana, per 3 multiplicata, separatim ponatur; quo facto per 7 multiplicetur et per 130 dividatur; summa et productum jungantur;

* Motus planetarum diurnus in commentario hoc modo definitur.

Sol.	Luna.	Mars.	Mercurius.	Jupiter.	Venus.	Saturnus.	L. A. S.	L. N.
0	13	0	4	0	1	0	0	0
59	10	31	5	4	36	2	6	3
8	34	26	32	56	7	0	40	10
$\frac{10}{21}$	53	28	18	9	41	24	$\frac{33}{56}$	$\frac{48}{20}$
33	0	3	28	9	39	0	..	..

summa, additâ positione fixâ, Mercurii positionem una cum gradibus, etc. exhibet.

20. Aharganâ, per 12 × 71 divisâ, fixus Jovis locus secundum plus et minus graduum, et minutorum proditur.

21. Aharganâ, per 10 et 88 divisâ et Lunae loco fixo additâ, Lunae apsis superior datur.

22. Aharganâ per 30 multiplicatâ et per 566 divisâ, minuta progrediuntur; idem numerus, plus fixi Lunae loci Lunae nodus est, quem alii astronomi Rahum vocant.

23-24. Aharganâ, per 13 multiplicatâ, et gradatim per sequentes numeros divisâ (viz. 101461, 151787, 190833, 24436, 1203400, 62416, 2990000, 898000, 1886800,) gradus, minuta etc. Solis ceterarumque planetarum produntur.

25. Numerus, Lunae gradus &c. definiens per 20 multiplicetur et separatim ponatur; fixae planetarum positiones si illis numeris addantur, Sole precedente, gradatim planetae una cum gradibus, minutis, etc. exhibentur.

27. Gradus, etc. ex Aharganae computatione progredientes, medios esse monere velim.

28. Planetae semper per Yajanos supradictos moventur, quod signis minutorum, etc. artificiali globo inscriptis apparet.

29. Quanquam planetarum orbitae, gradibus, minutis, etc. dividuntur, verum tamen minoris circuli gradus etc. minores, majoris gradus majores esse scias velim. Quare planetae a Lunâ ad Saturnum secundum orbitarum magnitudinem gradatim diminutâ celeritate circumvolvuntur.

Raj Mitra del. et lith.

1. Sciuropterus Chrysotrix. mihi.
2 Sciuropterus Senex mihi.
Habitat Central and Northern regions of the Hills. B.H.H.

J. Black, Asiatic Lith. Press, 3 Hare St. Calcutta.

Summary description of two new species of Flying Squirrel. By B. H. Hodgson, Esq. *B. C. S. With a colored Plate.*

The Editors of the Journal in publishing this brief article, and the plate which accompanies it, which is an exact *fac-simile* of the beautiful drawing made by Mr. Hodgson's Native artist, deem it an act of justice to that gentleman, to themselves as Editors and Officers of the Asiatic Society, and to their contributors, to explain how it has happened, that though the drawing has been in their possession since July 1842, it only now appears. It was sent to them from Katmandoo by Mr. Hodgson under the above date, with a request that the Society's Zoological Curator would add such remarks as he might think proper.

The paper was handed to Mr. Blyth, who also then saw the drawing, and as soon as the first impressions could be coloured, they were placed by the Editors in his hands. The colouring of the whole of the plates, (a very slow process in India,) was finished in August 1843.

The Editors in May 1844, had the paper returned to them with the following announcement from Mr. Blyth :—

"The truth is, both of them are species *already* described ; viz. the Pteromys *nobilis* and the *P. caniceps* of Gray, and it would not be creditable to the Journal that they should be published under Mr. Hodgson's new names."

They do not feel competent to decide on a question of priority of discovery nor of identity of species should any arise, and are herein only anxious to prove their earnest wish to do justice, both by liberal care and by early publication, to the labours of the correspondents of the Asiatic Society, and supporters of the Journal. The extract pointed out to the Editors by Mr. Blyth will be found in the note.*

RODENTIA.

Genus Sciuropterus.

1. Sp. new. S. *Chrysotrix*, mihi. General structure and size of *Magnificus*. Above intense ochreous chesnut, mixed with black and divided down the spine by a golden yellow line, and margined externally by

* *Extract from the Annals and Magazine of Natural History for December* 1842, *p.* 262 *and* 263.

Sciuropterus nobilis.—Bright chestnut-brown, with yellow tips to some of the hairs, pale rufous beneath ; the top of the head, the shoulders, and a narrow streak down the middle of the upper part of the back pale fulvous ; parachute large.

Hab.—India, Dargellan, Mr. Pearson, Mus. Ind. Comp.

Sciuropterus caniceps—Blackish brown, varied with red bay ; hairs long, dark blackish, with red bay tips ; out-side of the legs redder, beneath reddish yellow ; head iron-gray with longer black interspersed hairs ; throat white ; chin black ; small lunate spot on the upper edge red, and roundish spot near the base of the ears bright-red ; tail flattish, black with some redddish tipped hairs, fewer near the end. Body and head, nine inches ; tail, eight and a half.

Hab.—India, Dargellan, Mr. Pearson, Mus. Ind. Comp.

the same hue, which also spreads over the shoulders and thighs. Below, and the flying membrane with the lower limbs and tail, intense orange red, deepening into ochreous on the margin of the membrane, and on the limbs ophthalmic and mystacial regions defined by black; chin dark, cheeks mixed, a pale golden spot on the nasal bridge. Two inches of end of tail black. Ears outside concolorous with lower surface. Tail longer than the animal and cylindric. Pelage thick and soft, and glossy, woolly and hairy piles: average length of latter an inch and one-third. Snout to rump fifteen inches. Head to occiput (straight) three inches and three-eighths; tail, seventeen inches and a half; less terminal hair, fifteen inches and a half, ears one inch and one-third. Palma, less nails, one inch and seven-eighths. Planta, less nails, two inches and seven-eighths. Habitat, hills generally, but chiefly the central and northern regions. Sexes alike. *Remark.*—In colour much like Magnificus, but invariably distinguished by the pale golden line down the spine.

2. Sp. new. *Senex*, nob. General structure as above, but size smaller, and fur longer. Entire head, pepper and salt mixture, or iron grey: orbits and base of ears behind, intense burnt sienna. Entire body above and the tail and flying membrane, a full clear mixture of golden and black hues; shoulders not paled. Limbs intense aurantine ochreous. Margin of the parachute albescent, and neck below the same. Body below with parachute there, orange red. Tip of tail black as usual. Ears nearly or quite nude and tail subdistichous or flatter. Pelage longer and scarcely so fine as in *Magnificus* and in *Chrysotrix*. Longest piles an inch and three-quarters, and less glossy. Snout to rump fourteen inches, head two inches and seven-eighths, ears one inch and a quarter. Tail only fifteen inches, with hair sixteen inches and a half. Palma one inch and eleven-sixteenths. Planta two inches and a half.

Habitat as before.

Remark.—Differs from the two larger species of these hills, and approaches to the least, or *Alboniger*, by the less cylindric form of the tail and under-ears. Its pelage is coarser and less glossy than in any of the other three, but is fully as warm and thick.

July, 1842.

JOURNAL

OF THE

ASIATIC SOCIETY.

A Tenth *Memoir on the Law of Storms in India, being the* Madras *and* Masulipatam Storm *of 21st to 23rd May,* 1843. *By* Henry Piddington. *With a Chart.*

Between the 21st and 23rd May, 1843, a very severe hurricane was experienced on the coast of Coromandel, which seems to have extended from a short distance South of Madras to Masulipatam and Coringa. Great mischief was occasioned by it on shore and along the coast, and several vessels foundered at sea, or were driven on shore, among which were the ships and brigs *Amelia Thompson*, *Favorite*, *Inez*, *Union*, *Braemar*, *Joseph* and *Victor*, &c. with others more or less disabled.

It is to the always active zeal of Captain Biden of Madras, that I am indebted for the greater part of the documents from which the present Memoir is drawn up. I have as usual abridged them as far as possible, but so as to preserve carefully all the essential facts. I commence at Madras, with the logs of the ships farthest to the Southward; I then take those to the Eastward to trace the storm in its progress across the Bay, and finally, I give those to the North of Madras, as far as Calcutta. I then add, as usual, a summary shewing the grounds on which I have laid down the track of the storm, and embodying such other remarks as may have occurred to me.

Abridged Log of the Ship Bussorah Merchant, *Captain* Farrier, *from Bombay to Calcutta, reduced to civil time.*

18*th May* 1843.—P. M. strong monsoon, W. N. W. and West, with squalls and rain. 4 P. M. abreast of Point de Galle, distance 7 miles.

19*th May.*—Rounding Point de Galle, and at noon wind W. by S. and fine; steering N. E., latitude 5° 52′ N. longitude account 82° 12′ E. 4 P. M. strong W. by S. breeze. Bar. 29.56,* increasing to a hard gale W. by S. at midnight.

20*th May.*—Gale continuing W. by. S. latitude account 7° 20′ N. Bar. 29.26. P. M. continued heavy gale W. S. W.; squalls, rain and heavy sea; midnight Bar. 29.26.

21*st May.*—Day-light *more moderate*, wind S. W.; at noon Lat. 8° 30′ N., longitude 86° 29′. P. M. strong gale South, with heavy squalls continuing to midnight.

22*d May.*—A. M. finer, but gale continuing from the South to noon, when latitude 12° 00′ N., longitude 87° 24′ E. Bar. 29.36. P. M. South and S. S. E. monsoon gale, to midnight.

23*d May.*—Noon latitude 14° 34′ N., longitude 86° 30′ E., wind S. S. W., steady monsoon gale from midnight.

Extract from the Log of the Ship RAJASTHAN, *Captain* AIKIN, *from Calcutta to Mauritius, reduced to civil time.*

19*th May.*—A. M. brisk breeze E. S. E. and S. E.; at 7 A. M. S. E. by E.; at noon, ship standing to the S. S. W. Noon latitude observed 9° 1′ N., longitude 88° 16′ E. P. M. increasing with squalls, and Bar. stated to be "falling."† At midnight *more moderate*, wind S. E. by E. to East and N. E.

20*th May.*—1 A. M. wind N. E.; 4 A. M. wind shifted to the West; day-light increasing; 6h. 30m. hard gale from Westward; at 10 A. M. wind marked West; noon, Bar. 29.20; from 30.00, at which it had before stood, wind West. P. M. wind W. by S. Ship running from 1 A. M. from 5 to 7 knots to the Eastward, strong gale W. to midnight.

21*st May.*—A. M. the same; 5 A. M. hauled up to the S. E. by E. Noon, gale had moderated to fresh gale and heavy sea, latitude 8° 12′ N. Bar. 29.70. To midnight hard gale S. S. W.

22*d May.*—A. M. the same to noon, when latitude 7° 48′ N., longitude 91° 45′ E. Bar. 29.60. P. M. fresh gale, being on 23d and following days the usual monsoon.

* Corrected by a comparison in Calcutta.—H. P.

† Its height not given at this time.

Abridged Log of the H. C. Steamer TENASSERIM *from Aden, bound to Calcutta, civil time.*

21*st May* 1843.—A. M. fresh breeze from W. N. W., variable towards noon with squalls, and squally appearances all round from E. S. E. to W. N. W. and a heavy sea. Latitude 6° 48′ N., longitude chronometer 78° 3′. P. M. wind S. and S. W. fresh and squally. Midnight brisk gale with heavy squalls and showers and a heavy sea. Bars. at 4 A. M. 29.92 and .75. Noon 29.90 and .72. 4 P. M. 29.90 and .72.

22*nd May.*—Wind S. W., weather and sea the same. Latitude 5° 3′ N., longitude 80° 3′ E. P. M. wind W. S. W. and S. W. strong breezes and sea. Barometer 4 P. M. 29.80 and .40. Noon 29.30 and .40.

23*d May.*—Winds W. to S. W. by W., weather and sea the same. Noon, latitude 6° 49′ N., longitude 82° 58′ E. P. M. to midnight the same weather. Barometer at 4 P. M. 29.30 and .55.

23*d May.*—4 P. M. went into Trincomalee harbour.

Abstract of Log of the Bark CORINGA PACKET, *from* 13*th to* 22*d May, civil time. From Captain* BIDEN.

18*th May*, fine weather. Barometer fell from 29.70 to 29.50. At 8 P. M. 29.45, the weather still looking fine, sent down royal yards, took one reef in the top sails. Point Pedro bearing W. S. W., distance about 140 miles; midnight strong N. E. winds. Barometer 29.40.

19*th.*—2 A. M. a tremendous squall from E. S. E. attended with heavy lightning, struck the ship, and hove her on her beam ends; before being able to shorten sail, the main sails and fore and maintopsail were blown out of the bolt ropes. 4 A. M. blowing a fresh gale attended with heavy rain, bent another maintopsail, close reefed it, and set it. Daylight blowing a tremendous gale from E. by S., the sea running in pyramids, and the ship labouring very heavy. 8 A. M. Barometer 29.30. 10h. 30m. A. M. a very large water spout formed within about 2 cables length from the ship, passed across her stern, and hove the ship round head to wind, the fall of water on board the ship was tremendous. Observed the Barometer to rise immediately to 29.45. Noon

the sea abated, wind flew round to the N. W. in a tremendous squall, and the weather began to look more favorable. Observed Flag Staff Point, Trincomalle, bearing West, distance 10 miles. 3 P. M. wind from Westward, a strong double reef topsail breeze with clear weather.

20*th.*—Moderate throughout. Barometer at 28.50. 8 P. M. weather looking very bad to the W. S. W. Midnight blowing a heavy gale.

21*st.*—3. A. M. the gale increasing, and the sea rising, hove the ship to under close reefed maintopsail. Daylight blowing a terrific gale, the sea running in all directions, the ship labouring very heavy, and at times on her beam ends, the maintopsail blew out of the bolt rope. Barometer 29.40. Noon, latitude 5° 30′ N., longitude 83° 40′ E. 4 P. M. the sea and wind abated a little. 6 P. M. moderating fast, made sail gradually. 8 P. M. Barometer rising fast. Wind at West. Midnight fresh breeze and fine. Barometer 29.65.

22*nd.*—Moderate and fine; during the gale of the 19th and 21st, the ship has not suffered the least, and made no water.

Madras, 10th July, 1843. (Signed) T. B. CHILCOTT.

Abridged extract from the Log of the Ship MARQUIS OF HASTINGS, *Capt.* J. BIDDLE, *from Singapore bound to Calcutta, reduced to civil time. Forwarded by Capt.* BIDEN.

20*th May,* 1843.—Noon latitude 11° 51′ N., longitude 95° 5′ E. Moderate S. by W. to W. S. W. at midnight.

21*st May.*—S. S. W. wind to noon. Daylight, Narcondam bearing N. W. $\frac{1}{2}$ N., breeze freshening to 6 knots with squally weather to the Westward. 8 A. M. heavy squall from S. W. Noon moderate. P. M. light and cloudy and squally to Westward; wind S. W. to midnight.

22*nd May.*—Weather squally; S. W. by W. to S. S. E. wind; a cross sea from S. W., latitude 14° 52′, longitude 93° 57′ E. P. M. Preparis bearing West, distance 10 miles, light winds N. W., dark and squally. midnight strong breezes N. W. and heavy sea.

23*rd May.*—A. M. the same strong breeze and heavy cross sea, wind N. W. Noon latitude account 16° 42′, longitude 92° 4′ E. At 6 P. M. wind about West. At P. M. veering to S. W., and moderating to the usual monsoon at midnight.

24*th May.*—Noon latitude 17° 58′ N., longitude 90° 10′ E. Light Vessel, computed to bear N. W. ½ N. distance 200 miles.

Ship BRAMIN. *Extract forwarded by Capt.* BIDEN.

The ship Bramin from Singapore bound to Madras, had from 20th May, between latitudes 8° and 8° 38′ N. heavy threatening weather from S. by W., veering gradually to S. W., and reducing her to close reefs till the 23rd, when the weather became finer. No Barometer or longitudes are given in her log, but we may take it that she was far to the Eastward, and that this was the usual weather at the setting in of the monsoon.

Extract from the Log of the Barque SERINGAPATAM, *from Acheen Head to Madras, reduced to civil time. Forwarded by Capt.* BIDEN.

From the time of leaving Acheen Head, we had a continuance of gloomy unsettled weather to the—

20*th May.*—Wind S. S. W. 4 P. M. increasing gales, heavy squalls with rain, thunder and lightning, latitude 7° 30′, longitude 98° 50′.

21*st May.*—At noon wind S. S. W., latitude 9° 10, longitude 88° 50′. Commences with heavy squalls, with rain, thunder and lightning, a heavy confused sea.

At 8 P. M. increasing gales, heavy squalls, gloomy weather close reefed topsails, and reefed foresail.

Throughout these twenty-four hours, a continuance of heavy squalls and gloomy weather.

22*nd May.*—Wind S. W. by S., latitude 10°, longitude 85° 30′. Commences with heavy gales and squalls of rain, thunder and lightning, a heavy confused sea, under close-reefed topsails; latter part more moderate, made sail.

The remainder of the passage gloomy, unsettled weather, squally with rain, thunder, and lightning, with a continuance of threatening appearances.

S. FOSTER, *Mate.*

Abstract of the Log of the Transport Barque TEAZER, *from Madras to Penang with Troops on board, reduced to civil time. Forwarded by Captain* BIDEN.

19*th May*, 1843.—At noon latitude 12° 00′ N., longitude 81° 28′ E. Barometer 29.72. Thermometer 86°. Weather very threatening, and winds variable, hove to; the wind not marked, but apparently from S. W. to S. S. W. At 3 P. M. made sail, winds to midnight marked about S. E.

20*th May*.—Shortened sail and hove to again at noon, in consequence of the threatening weather and disturbed sea; wind marked as variable from E. to N. N. E. Noon no observation, latitude account 11° 18′, longitude account 82° 40′ E. Barometer 29.70. Thermometer 86°. P. M. every appearance of bad weather, wind increasing to strong gale from about N. W., violent squalls and rain. Wind not marked, but from about 9 P. M. "running free," course E. S. E., 8 knots, to midnight, under close reefed maintopsail, foresail, and foretopmast staysail; gale increasing fast.

21*st May*.—2 A. M. "scudding *almost* before it," course E. S. E., 9 and 10 knots (hence wind W. by N. or West? but not marked!) At 8 a very violent squall W. N. W. veering to S. W. 11h. 30m. foresail blew from the yard, ship scudding 12 knots, broached to. Noon hove to, a complete hurricane. Barometer 2 A. M. 29.70

6 ,, 29.40

8 ,, 29.30

Noon ,, 29.20

Noon, latitude account about 10° 43′ N., longitude 85° 4′ E.

P. M. gale continuing, wind not marked,

4 P. M. Barometer 29.20

,, Midnight 29.45

22*nd May*.—At 7 A. M. gale a little moderated. Noon latitude indifferent observation 11° 25′ N., longitude 85° 10′ E. Barometer 29.60. P. M. wind marked S. S. W. and at 5 P. M. South; gale moderating to midnight: making sail and repairing damages.

23*rd May*.—More moderate, wind still (apparently) South. Noon latitude by account 11° 58′ N. longitude 86° 27′ E. Barometer 29.66. Thermometer 86°. P. M. moderating, but still threatening.

24th May.—Fine. Noon latitude 11° 10′ N., longitude 88° 37′ E. Barometer 29.68. Thermometer 88°.

At Penang, the Meteorological Register kept there by order of Government, gives at 9h. 40m. A. M. the following state of the Barometer for—

17th	May 1843,	29.954
18th	ditto	—.886
19th	ditto	—.888
20th	ditto	—.938
21st	ditto	—.926
22nd	ditto	—.944
23rd	ditto	—.930

There is nothing in the remarks of the weather, &c. to indicate any extraordinary disturbance.

Observations at Calcutta. By H. PIDDINGTON.

21st May, Sunday Eveniug, 1843.—8 P. M. stars particularly clear and brilliant, The zodaical light like a comet; to the South, stars visible at 5° elevation.

22nd, Monday.—A. M. Barometer fallen from 29.8 on the 21st to 29.7, squally from S. S. W. with light rain, and in the evening a heavy shower, East heavy nimbus. Barometer 29.76

23rd, Tuesday.—Dark gloomy weather, squalls and rain from S. W. and South. Bar. 29.70.

24th Wednesday.—6 A. M. Barometer 29.775, dark gloomy nimbi from East to Zenith. To the Westward clear with strata at intervals. To the Southward, at times much smoky scud driving rapidly across from the East, light breezes and puffs at intervals, with drizzling rain from the East.

At the Surveyor General's Office at Calcutta, at Noon, the Barometer on these days stood as follows :—

May	21st	Bar.	29.698
„	22nd	„	—.665
„	23rd	„	—.590
„	24th	„	—.610

At Bombay the Standard Barometer corrected to Temp. 32°, *was at*

20th	..	...	29.572
21st	..	..	Sunday.
22nd	..	..	—.456
23rd	..	..	—.395
24th	..	..	—.434
25th	...	...	—.495

From the Madras Athæneum.

Vizagapatam.—On the evening of the 21st ultimo, the rain commenced pouring down in torrents, and continued so for the space of nearly one week, accompanied by a strong wind, which set in from the North East, veered round to the East and blew a furious hurricane from that quarter; during its continuance, a solitary Dhoney which was riding at anchor in the roads, having been the previous evening deserted by the greater portion of her crew, parted from her anchor, and was driven to the shore with only three men on board; and she went to pieces a very short time after. A native brig also ran ashore, (intentionally as is generally supposed,) and she now lies a total wreck about a mile or two to the Northward of this place. Recent accounts from the Northward mention the fact of wrecks of vessels being strewn along the coast, and that about a dozen native craft have wrecked or foundered between this and Ganjam.

Abridged Extract from the Log of the Brig Union, *Captain* Springer, *from Coringa bound to Pondicherry, reduced to civil time. Forwarded by Captain* Biden.

The *Union* left Coringa on the 19th May 1843, on which day at noon Coringa Light House bore West about 7 miles distant. P. M. light winds, and at midnight fresh breezes Eastward.

20*th May.*—Noon, wind E., latitude 15° 1′ N., longitude 82° 37′ E. P. M. freshening from N. E. Evening and morning with heavy rain; made preparations for bad weather. Midnight strong gales, apparently N. E. Vessel very leaky, and heaving cargo overboard.

21*st May.*—To noon gale increasing. No longitude or latitude marked. P. M. wind marked N. or N. by W. Vessel scudding, and gale increasing to midnight.

22*nd May.*—Gale still continuing, but apparently veering to the Westward, for it is marked at W. N. W. At 1 P. M. vessel scarcely kept afloat and sinking, but always scudding.

23*rd May.*—1 A. M. wind S. W. At 7 A. M. saw the bark *Helen*, Captain Driver, and succeeded in getting on board of her, the brig going down shortly after. At noon on this day, *Helen's* latitude was 11° 50′ N., longitude 82° 30′ E.

Abridged Report of the Master Attendant of Coringa, forwarded by Capt. BIDEN, *civil time.*

20*th May.*—A. M. N. E. Wind 1 P. M. Easterly. 10 P. M. N. E. fresh breeze, with thunder and cloudy weather to the Southward.

21*st May.*—Wind N. E. with heavy squalls throughout; latterly constant showers of rain.

22*d May.*—A. M. Wind N. E. At 5 P. M. Easterly heavy gales, and constant showers of rain throughout.

23*rd May.*—1 A. M. wind marked S. E. 3 A. M. Southerly, moderating to fine weather at midnight.

Abridged Log of the Barque Candahar, Capt. RIDEY, *from Bombay bound to Calcutta, civil time.*

19*th May, Friday.*—Throughout light variable breezes E. N. E. to E. S. E. Noon latitude 15° 26′ N., longitude 81° 30′ E.

20*th May.*—A. M. 5 knot breeze N. E. by E. to S. E. and N. E. at noon, when latitude 16° 06′ N., longitude 82° 13′ E. 4 P. M. Barometer had fallen to 29.60, with threatening appearances; made all snug for a storm. At 10 P. M. wind N. E. by E. increasing rapidly to midnight.

21*st May.*—A. M. wind N. E., storm increasing with violent squalls, ship lying to. A barque to windward, sea very high, Barometer down

to 29.55. No observation, latitude account 15° 40′, longitude 82° 40′ E. P. M. to midnight increasing storm, sea making a clear breach over the vessel.

22*nd May.*—A. M. heavy gale N. E. weather as before. At 10 A. M. wind marked at S. E. Barometer at 8 A. M. 29.35. Noon latitude by account 15° 30′ N., longitude account 83° 00′. 1 P. M. "blowing a perfect hurricane at S. E. with a terrific cross sea." 1h. 30m. P. M. Barometer at 28.83. At 2h. 30m. P. M. "hurricane at its highest, and drawing round to the Southward; vessel making very bad weather." At 4h. 30m. P. M. Barometer inclining to rise a little, but no change in the weather. "Hurricane continuing to blow if possible with more fury." At 6 P. M. "hurricane having shifted to South, wore ship as we were drifting fast in shore." 8 P. M. Barometer 29.29, and wind more moderate. Midnight a heavy gale with squalls at times.

23*rd May.*—A. M. hard gale S. S. W., daylight abating, but sea very heavy. Noon latitude 15° 38′, longitude 83° 20′ E. Wind S. S. W., strong gale to midnight.

24*th May.*—Strong monsoon from S. W. to W. S. W., latitude 17° 42′, longitude 85° 00′. On the 25th, arrived in soundings, and on 26th at noon, Point Palmiras Light House bore N. E. by N. 4 or 5 leagues.

Abridged Log of the Barque EUPHRATES, *Capt.* WILSON, *from London, bound to Calcutta, reduced to civil time.*

19*th May*, 1843.—To noon fine weather, wind from East to N. E. by E., which had also been about its direction for the preceding 24 hours. Noon latitude 14° 51′ N., longitude 81° 28′ E. P. M. to midnight the same winds and weather.

20*th May.*—Winds from N. E. to North, freshening from North at noon, and from latitude 16° 2½′ N. longitude 81° 40′ E. At 10 A. M. Masulipatam bore W. ½ N., 10 miles. P. M. moderate breeze E. N. E. increasing at 8 with thunder, lightning and rain. Midnight very threatening appearance; wind E. N. E., making all snug and standing to the S. Eastward.

21*st May.*—By 6 A. M. hard gale E. N. E. 10 A. M. *variable.* At noon N. Easterly, hard gale and squalls, with heavy rain. Latitude

by observation 14° 40′ N., longitude 82° 52′. " An Easterly current the last 24 hours, the high Easterly swell *preceded* the wind about 4 hours, and the sea got up very rapidly with the wind,"* Noon, Barometer 28.90. Sympiesometer 28.80. At the commencement of the gale, Barometer 29.80. Sympiesometer 29.60. P. M. hard gale N. E., high cross sea. Midnight very hard gale. Wind at 9 P. M. Easterly. Midnight E. S. E.

22*nd May.*—5 A. M. blowing a hurricane. 7 A. M. wind S. E. by S., wind drawing S. E. and Southerly in the squalls. Noon wind S. S. E., hurricane still continuing. Latitude account 14° 08′ N., longitude 82° 29′ E. P. M. continued heavy hurricane at South. *Hail* and rain at 1 P. M. 6 P. M. Barometer rising rapidly, wore and bore up to the N. E. by E. 7 P. M. wind S. S. W. 8 P. M. Barometer 29.20. Midnight hard gale and heavy squalls.

23*rd May.*—2 A. M. wind S. S. W. 6 A. M. to noon moderating, and sail was gradually made, wind S. S. W. Latitude observation 16° 17′, longitude 83° 44′. " A set of 62 miles South 69° E. in the last 48 hours." To midnight variable, and squally from the South to S. S. W.

Abridged Log of the Barque Lord Elphinstone, *Captain* Crawford, *from Madras towards Vizagapatam; civil time. Forwarded by Captain* Biden.

21*st May, Sunday,* 1843.—First part cloudy weather with wind from N. N. E. to N. E. Barometer falling from 29.98 to 29.55. At 3 P. M. dark gloomy appearance with sudden gusts of wind, prepared for bad weather. At 11 P. M. severe squalls. Midnight strong gales from N. N. E. to N. E., veering between the two points. Barometer, middle part 29.50 to 29.42, latter part and noon 29.20. Latitude 15° 45′ N., longitude 83° 15′ E. by dead reckoning.

22*nd Monday.*—Severe gales from N. E. to E. N. E. and East; at 10 A. M. blowing very hard with a high sea; at 10-30 severe squalls split the double reefed topsails; Barometer 29.8 hove the ship to with

* This remark is worth attention. The Easterly set was probably the outpouring of the Godavery.

a tarpauling on the weather mizen rigging, at noon terrific squalls, got the anchors secured with extra lashings, ship behaving very well, Barometer from 28.8 to 29.0, 28.90 and 28.80. At 1 P. M. a heavy sea struck the back of the rudder, carried away some of the pintles and gudgeons, got a hawser passed over the stern to keep the rudder steady; at 2 if possible, blowing harder, the lee side of the fore castle, and top-gallant rail under water; wind veering from East to E. S. E. and S. E. blowing very severe.

23*rd Tuesday.*—Barometer at 2 A. M., 28.75 wind hauling to S. S. E. the hawser securing the rudder cut through, the rudder now beating from side to side at a most fearful rate making all tremble; at 5 wind South, at 6 broke down the after cabins to get at the rudder, all the pintles being gone with the exception of the upper one; succeeded in lifting it out, and letting it go clear of the ship. 8 P. M. wind moderating at S. S. W. Midnight Ditto; Barometer 29.0 to 29.5 and 10.

24*th Wednesday.*—Ship making a great deal of water, observed the counter stove in, and the rudder case all started in consequence of the time it took to get clear of the rudder; all hands, with the passengers, employed at the pumps; at 2 getting more moderate, commenced making a jury rudder with the spanker boom for a main piece and 20 fathoms of chain cable.

25*th May.*—Employed at the pumps and rudder, got it over and made sail; latitude 16° 18′ longitude 83° 18′ 45′ E. deemed it proper to haul up for Coringa to repair damages, at 4 P. M. sighted Coringa Light. Noon, anchored in the Roads, the crew quite exhausted from incessant labour.

This hurricane according to Col. Reid's Theory of Storms, passed from E. N. E. in a W. S. Westerly direction, and the centre of it could have been no great distance from us to the southward, at least not more than from 6 to 8 miles.

I have seen the Commander of the unfortunate Amelia Thompson, he says this Hurricane commenced with him from N. Westward, vering to West and S. Westward, thereby shewing that the centre of this turning wind or hurricane was to the Northward of him.

The Barometer is by Troughton and Sims, a most excellent instrument, its average range in ordinary weather is from 29.90 to 30.10 and 30.12. (Signed,) H. Crawford.

Extract from the Log of the Barque LYNDOCH *from Madras towards Vizagapatam, reduced to civil time. Forwarded by Capt.* BIDEN.

20*th May Saturday*, 1843.—1 P. M. of 19th, winds E. N. E. steady breezes and fine weather; 4 P. M. ditto wind and weather; 6 steady breezes and cloudy weather; 8 squally; 10 wind E. by S. midnight squally with rain, wind E. by N. At 2 A. M. 20th increasing winds and squally with lightning to the Eastward. Daylight *decreasing winds* and cloudy weather. At 8 winds E. N. E. and ditto weather, at 10 squally. Noon steady breezes and fine, watch employed bending mainsail. Latitude by observation 18° 42′ North.

P. M. Winds E. N. E. fresh breezes and cloudy weather; at 4 increasing breezes and cloudy. At 6-30 increasing wind, at 8 fresh winds and cloudy with lightning. At 10-30 strong breezes and squally. At 12 strong breezes and squally.

21*st May*.—A. M. Wind N. E. by E.; at 2 increasing gales; at 3 and at 10 strong gales. Wind E. N. E. squally weather at 11 severe gales; noon, increasing gales and very severe squalls; sun obscured. P. M. Wind E. N. E. strong gales and squally; at 5-45 increasing gales and severe squalls. At 8 severe gales and thick hazy weather; at 9 increasing gales and very severe squalls with rain, laid the ship to under the close reefed trysail and double reefed spanker; at 12 strong gales and very heavy squalls.

22*d May*.—At 4 increasing gales and severe squalls with rain, Daylight heavy gales and very heavy squalls. At 8 blowing a tremendous hurricane. Noon the same. P. M. wind N. E. by E. 30 wore ship; at 1 P. M. shift of wind from the westward, and the ship under bare poles; at 3 wind W. S. W.; at 4 blowing a tremendous hurricane, and the ship lurching very heavily, filled the larboard quarter boat, cut her away; at 4-30 ship lurching very heavy, greatly damaged starboard quarter boat, carpenter prepared his axes to cut away masts if necessary. At 5 carried away the spanker gaff; at 6 the hurricane abated a little; at 8 very strong gales and severe squalls with thick hazy weather. Midnight strong gales and severe squalls with thick hazy weather.

23*d May*.—Daylight inclined to moderate with decreasing squalls. At 10 more moderate; at noon decreasing wind and cloudy, sun obscured. 7 A. M. wind S. S. W.; 10 S. W.

P. M. Wind S. W. by S. At 7 S. by W. P. M. strong gales heavy squalls, rain, and a heavy swell running; at 5 more moderate; at 10 increasing gale. Midnight increasing squalls with rain.

24*th May.*—At 4 P. M. moderate with a fine clear sky; daylight moderate; 10 wind S. by E.; 11 South; Noon moderate and fine; latitude by observation 16° 24′ N.

To the foregoing Log, Captain Biden adds the following valuable notes obtained by him from Captain Corney.

"I have just got hold of Captain Corney of the Lord Lyndoch, he says at $\frac{3}{4}$ past Noon on Monday the 22d, the Barometer fell from 28.35 to 27.95—at 10 A.M. it was at 28.35—he says the strongest gusts were about 1 P. M. when there were intermitting severe gusts, *accompanied by great and terrible heat—and there were alternate gusts of heat and cold* after the hurricane veered to S. W.*

"The commencement of the Gale was from N. E. by N., just after Midnight on the 20th—all the 21st the Easterly gale continued—the change was preceded by a dead calm which lasted $\frac{3}{4}$ of an hour.—, and the shift was about *one p. m.* on Monday, when the Barometer was at its minimum—a tremendous cross sea arose at this time, but the swell from the S. W. soon subdued that which had got up from the Eastward. Rain and drift of sea accompanied the hurricane, darkening the atmosphere very much—sails were blown away from the yards, though well secured with studding sail gear, &c.

Ship was nearly thrown on her beam ends. Poultry drowned on lee side of the Poop."

Abridged Log of the Ship JULIA, *Capt.* JONES, *from Calcutta to the Mauritius, reduced to Civil time.*

18*th May.*—Noon in latitude 18° 29′ longitude 89° 38′. Calms and light rains to midnight. "Heavy clouds rising from S. E. quarter. Barometer only 29.75, which is lower than it stands generally." Midnight light S. W. breeze.

19*th May.*—2 A. M. light S. E. breeze to noon when latitude 18° 05′ longitude 89° 06′ observation. 7 P. M. freshening, vivid lightning S. S. E. to S. S. W.; midnight steady breeze S. E.

* The italics are mine.—H. P.

20*th May.*—1 A. M. Barometer 29.72. Noon, increasing breeze S. E. by E. squally and heavy head sea; latitude 16° 09′ longitude 88° 13′ Barometer 29.75. P. M. hard squalls wind E. S. E. threatening appearance to the Eastward. 7 P. M. severe gusts with rain and lightning; 11 P. M. wind S. E. by E.; 1 P. M. Barometer 29.55; at 6 P. M. 29.50; at 9, 29.50; midnight 29.50. Thermometer 86° throughout.

21*st May.*—S. E. by E. gale, with increasing heavy cross sea; 2 A. M. S. E. Noon strong gale; latitude account 13° 50′ longitude 86° 46′ Barometer 1 A. M. 29.50; 4 A. M. 29.50; 6 A. M. 29.49; 9 A. M. 29.48 Thermometer 86°. P. M. wind S. E. to S. S. E. severe gale. 6 P. M. severe gale with squalls at times "attended with a thick fog." Midnight the same weather; 1 P. M. Barometer 29.48; 6 P. M. 29.48.

22*d May.*—To noon, wind S. E. to S. S. E. severe gale with heavy cross sea; latitude account 13° 47′ longitude account 86° 05′ E. Barometer 1 A. M. 29.50; 6 A. M. 29.50; 10 A. M. 29.50. Thermometer 86°. P. M. wind S. E. to South, strong gales and sea as before. 4 P. M. moderating a little; 7 gale increasing again, midnight strong gale and clear weather, wind about South. P. M. Barometer 29.45; 6 P. M. 29.45; 11 P. M. 29.40. Thermometer 86°.

23*d May.*—A. M. The same gale from South. Barometer 5 A. M. 29.40. 11 A. M. 29.40; Ther. 86. Noon latitude observation 15° 47′ longitude 85° 20′. The Log remarks that the Vessel had suffered much by the heavy cross sea arising from a S. E. and S. W. swell for the last 24 hours. P. M. wind Southerly, more moderate; 5 P. M. again increasing. Barometer 1 P. M. 29.55. 6 P. M. 29.55; Ther. 86°.

24*th May.*—A. M. becoming fine; wind South to Noon, when latitude observation 15° 42′ N., longitude 85°51′ E. Barometer at 2 A. M. 29.60; 11 A. M. the same. Thermometer 86°.

Extracts from the Log of the Transport CHAMPION, *Captain* BUDD, *reduced to civil time. Forwarded by Captain* BIDEN.

18*th May.*—Light airs from E. N. E. and hot, sultry weather; strong set to the Northward, and much swell from the Eastward, latitude 14° 6′. Barometer 29.9.

19*th*, *Friday*.—Light airs from E. N. E. and sultry weather, latitude 15° 29′. Barometer 29.85. P. M. light breeze from the Eastward and heavy wind.

20*th Saturday*.—A. M. Cloudy weather and much lightning with heavy swell from the Eastward; latter parts squally with distant thunder and vivid lightning and suspicious looking weather; saw the land off Narsapour Point. Latitude 16° 9′. Barometer 29.85 to 29.75. P. M. fresh increasing breeze from N. E. and heavy swell, exchanged signals with the "Inez;" prepared for bad weather. Throughout the night hard squalls from Eastward and E. N. E. with a heavy sea getting up and much rain and lightning.

21*st Sunday*.—From daylight to noon blowing a strong gale with occasional hard squalls and rain; under a close reef main topsail and close reefed mizen. Latitude by account 15° 31′. Barometer 29.70. P. M. heavy gale and increasing, with much sea, and ship labouring greatly, wind drawing to E. S. E. Midnight, increasing in violence with tremendous squalls and rain.

22*d Monday*.—Ship now labouring greatly with the heavy seas, lashed one half of the new poop awning to the Gaff to assist in keeping to. Barometer 29.60.

P. M. Wind drawing round to the Southward and inclining to lull; suspecting a sudden shift round to the S. W. immediately wore ship, which no sooner done, and, had the yards again secured, when it commenced blowing a perfect hurricane from South, accompanied with dark weather, and tremendous heavy rain and high sea, which threw the vessel completely on her beam ends, staving in the quarter boat. I now fully expected every instant to see the masts all go by the board, as from the great and constant labouring of the vessel the rigging had become quite slack, and the topmasts were pressed over like a bow; fortunately we had taken the precaution previous to have swifters on, as in righting again and rolling suddenly to windward, it would all have snapped during the tremendous gusts, and after, it was impossible to distinguish any thing the length of the vessel, from the violent rain and drift of the sea which completely washed over all. From our position by reckoning, and great drift which we have experienced whilst lying to from the commencement, and heavy seas from the eastward and S. E. and which still in-

creased in force carrying the vessel right before them, I fully expected, should the wind not draw round to the S. W. that we should be driven before night upon Narsapour Point, for the wind had hung so constantly to the Eastward that with difficulty we could obtain an offing; immediately after the vessel righted I got below to my cabin and found the Barometer had fallen suddenly from 29.60 to 29.20.* the gale continued without intermission with hard squalls and rain with tremendous cross sea until midnight.

23*d Tuesday.*—Midnight drawing round to S. S. W. and abating in strength afterwards, when we made a little sail and kept away East. During most part of the night the pumps were constantly at work. From daylight to Noon decreasing, but still hard squalls; by indift obsn. Latitude 16° 0′ Longitude 83° 20′: found we had experienced a strong lee current.†

24*th Wednesday.*—P. M. decreasing with passing squalls and much sea, wind S. S. W. Barometer 29.60.

25*th Thursday.*—The weather commenced moderating and sea subsiding, anchored at *Vizagapatam*, Barometer 29.60. to 29.90.

VINCENT BUDD,
Commander.

Report from the Bark Chatham, Capt. GIFFORD, *forwarded by the Marine Board.*

In the Bay I experienced a severe gale from N. E. to S. E. commencing on Saturday the 20th May at 10 P. M. and lasting to Monday the 22d May noon, when it moderated. My Latitude was 16° Longitude 84° in the height of the gale, by dead reckoning, and by comparing logs with the Euphrates. I find it was more severe 30 miles S. W. of our position. WM. GIFFORD.

Report from Masulipatam by R. ALEXANDER, ESQ. *forwarded by Capt.* BIDEN.

Masulipatam 23*d May*, 1843.

From the weather we have experienced here I fear that you have had a gale at Madras, and bad weather both to the Northward and

* The italics are mine, for this remarkable fall is a very curious phœnomenon.
† The storm wave.—H. P.

Eastward, the weather has been unsettled here for some days, and since the 20th the wind has been from the N. E. On the 21st we had heavy squalls with rain, with the Barometer falling. From yesterday morning the Barometer fell rapidly as you will observe by the following memorandum.

22nd May at	4 P. M.	Bar. 29.080	
	4.30	.050	
	5.	gale, increasing and blowing in violent gusts.	
Violent Gusts	6.24	Bar. 28.900	
	6.30	.875	
	7.	.820	much lightning to S. and S. E. and thunder.
	7.30	.730	
	8.	.760	
	8.30	.730	
	9.	.760	
	10.	.760	
	10.30	.760	
P. M.	11.	Bar. 28.774	
	11.30	.820	
	12.	.940	
23rd	1 A. M.	.980	
	2	29.050	½ P. M. 2 wind changing to E. S. E. and then to S. and S. b W. blowing with great violence with drizzling rain.
	3 A. M.	29.100	
	4	.150	
	5	.175	Noon the Barometer is now up to 29.300 blowing fresh from the Southward.

Two Brigs and one Sloop are on shore, and four Brigs have lost their main masts; several of the cargo boats are driven inland, as well as a sailing boat of my own missing, with large stores of firewood and timber. Great damage has been done in consequence of the sea having inundated the place; the inundation extended beyond the first range of Garden Houses, and the Causeway is rendered useless, the sea having flowed over it and breached the retaining walls in several places, besides carrying away all the stone coating; the Bund leading

from the Fort to the Village of Gillumdindee is also breached. The sea flowed into the Fort through the East and sea gates, one doney is left close to the brick work of the pettah gate, a large boat is lying against the Causeway, and part of a Lower mast lying on the causeway half a mile from the Fort.

Trees in every direction have been blown up by the roots, windows and doors of substantial houses blown in, and a number of Native huts and buildings destroyed. From Noon of the 21st to 5 P. M. 22nd, we had 2.025 inches of rain. I have just received a report of one Brig having foundered with all on board, with the exception of one Lascar who saved himself on a plank.

Masulipatam, 15th Sept. 1843.

My dear Sir,—The greatest violence of the gale on the coast, appears to have been felt here, although it was felt as far North as *Culingapatam.* I have no information with regard to the distance it extended to the Westward, and in the Guntoor and Patnaud Districts the damage appears to have been caused by the torrents of rain, while here all the rain that fell during the gale did not amount to $2\frac{1}{2}$ inches, there was thunder and lightning during the gale, but not much. The gale commenced from N. E. and N. N. E. and ended at S. W.

Report from the Acting Master Attendant at Pulicat. Forwarded by Capt. Biden.

We had a strong gale here, accompanied with heavy rain, which commenced on Sunday morning the 21st at about 11 o'clock—blowing N. N. W., and abated the following day at noon. I am happy to add that, with the exception of a few old buildings which fell down, no other material injury was done at this place; no vessels were in these roads on the day of the gale.

Abridged Reports from Madras, by Captain Biden.

The range of the Barometer at Madras during the late gale was from 29.67 to 29.37—and at Ennore, about 8 miles to the Northward

of Madras it fell as low as 29.30 at 3 A. M. on the 22d instant. Wind veering throughout the 21st from N. N. W. to W. N. W.—the quantity of rain which has fallen in 48 hours is $10\frac{1}{2}$ inches. Fourteen vessels put to sea from these Roads between 11-30 and 1 P. M. on the 21st May.

CORDELIA.—Went as far out as 82° 20′ E. Latitude 11° 30′ N. Barometer fell to 29.0 and continued as low as 29.20 two days. The heaviest of the gale was from N. W. ending at S. W. on Tuesday. During the gale the sea was very heavy and confused, more so than commonly in such gales.

BRAHMIN *from Singapore to Madras, Saturday 20th May,* squalls at 4 P. M. midnight dark cloudy weather. Wind throughout veering from S. W. to S. S. W. 6 A. M. heavy squalls with much rain— Noon gale increasing ; wind S. by W.

Sunday 21st.—Strong gale and squalls with much rain. Wind S. by W. Midnight ditto weather. 6 A. M. more moderate, noon clear, latitude observation 8° 16′ N.

22*d Monday.*—Commenced with unsettled weather, heavy squalls with much rain, throughout squalls and unsettled weather, wind veering from S. W. to S. S. W.

Tuesday 23*d.*—Strong breezes and squalls, wind S. S. W. Midnight dark cloudy weather. 4 A. M. more moderate and clear. Noon wind S. W. clear weather, latitude observation 8° 38′.

The *Barque* BRAEMAR slipped from Madras Roads with the wind at N. N. W., N. W. and finally W. N. W., She was laid on her beam ends and righted only by cutting away her masts, the wreck of which carried away her rudder. The Vessel became water-logged and nearly unmanageable and was driven by noon 23rd May to latitude by observation 12° 55′ N. Wind at 1 P. M. on 22d civil time, being W. S. W. and at 1 A. M. 23d S. W. by S. She was finally driven on shore and wrecked near False Point Divy.

Ship HENRY.—Put to sea from Madras Roads, and had the wind veering from N. N. E. at 1 P. M. on the 21st May, to S. W. by W. at noon on the 22d, when the Barometer was at 28.90. At midnight, wind S. W. Barometer 29.20, the gale moderating towards daylight on the 23rd ; at noon of which day she was in latitude 13° 18′ and at noon of the 24th in latitude 12° 26′ N. longitude 81° 57′ E.

Brig Briton.—This vessel slipped and ran to sea with the wind at N. W. at 1. 30. P. M. on the 21st May civil time. At 7 the wind was North, and at 10 N. N. E. Vessel steering E. by S.

On the 22d at 5 A. M. the wind shifted to West in a hard squall. At noon hard gale, latitude by indifferent observation 12° 15′ N; by account 12° 35′: longitude account 82° 51′. Barometer 29.20, having made by log 158 miles E. by S. and E. S. E. from Madras roads.

The wind marked S. W. fresh gales at midnight, moderating.

On the 23d at noon latitude observation 11° 36′ N. Account 12° 7′ Barometer 29° 40′, Chronometer 83.25. Account 83.52.

Ship Baboo—had increasing gales as she proceeded to the Eastward, and at 2 A. M. on Monday 21st May, had it blowing very hard from W. N. W. with continued sleet showers, thunder and lightning. Two Barometers at their lowest 28.29. On Monday 22d at noon, latitude obs. 12° 33′ N. and longitude per 2 chros. 82° 0° E. Since then had the wind mostly from S. S. W. to West. *Baboo's* Barometer when she slipped was at 29.20, and here it stood, then at 29.57; her Barometer is therefore .37 below the true range.—N. B. See subsequently her report.

Report of Capt. Stuart *of the Barque* Baboo, *to Capt.* Biden. *Forwarded by that Officer.*

On Sunday at 12-30 we slipped from 80 fathoms cable and went to sea.

Had an increasing gale as we went to the Eastward, and at 2 A. M. on Monday 21st May had it blowing very heavy from W. N. W. with continued sleet showers and much thunder and lightning. My two Barometers at their lowest 28.29.

The *Kyd* was the last of the ships seen by us on Sunday evening, and none of them were seen afterwards. I laid my ship to, having broke part of the wheel and got the man steering maimed, otherwise we had no casualties.

On Monday at noon my latitude was per observation 12° 33′ N. and longitude per two Chronometers 82.0 E., since then had mostly the winds from S. S. W. to West.

Ship Isabella Watson, *Capt.* J. A. Macdonald, *from Madras to Calcutta: report from her Commander, reduced to civil time.*

19*th May* 1843, *Friday.*—The weather was close and sultry with a heavy swell rolling in on the beach indicating the approach of a storm. Thermometer at noon 83°43′, sympiesometer 29.36.

20*th Saturday.*—A. M. hove short and made sail from Covelong; 7 A. M. came to anchor in Madras Roads, hard squalls from the N. W. with heavy rain; observed the flag flying at the fort for all ships to prepare for sea. Thermometer 48°, sympiesometer 29.26. P. M. squally and variable from N. E. to North with heavy rain.

21*st Sunday.*—A. M. made sail from Madras Roads, at 4 A. M. hard squalls and rain from N. N. E.; 10 A. M. blew very hard with squalls and rain from N. E. to N. and a high turbulent sea running. Under close reefed main top sail; noon blowing very hard with a high cross sea and heavy rain. Thermometer 83°30′, sympiesometer 29.16.

A continuance of the N. E. gale. At 2-30 P. M. Thermometer 84° sympiesometer 28.96. The ship labouring this time most fearfully, 8 P. M. Thermometer 83° sympiesometer 28.84. 9 P. M. Thermometer 83°, sympiesometer 28.0 a fearful sea running.

22*nd May.*—3 A. M. a heavy squall with hail and rain; 8 A. M. the gale blowing with greater violence with a turbulent cross sea, making a fair breach over the ship, and straining her very much. Thermometer 83°, sympiesometer 28.64. Noon ditto weather.

Madras bearing by account West and by North 70 miles.

2 P. M. Thermometer 83°30′, sympiesometer 28.70. 3 P. M. sympiesometer 28.84, the weather more moderate, but a turbulent sea, the wind flew suddenly from N.W. to West. At 4 P. M. it came from S. W. and continued so with dark weather and rain.

23*rd May.*—At noon Thermometer 84°30′, sympiesometer 29.11.

Abridged Report from Capt. Onslow, *of the Ship* General Kyd, *to the Secretary to the Marine Board, Calcutta.*

The ship General Kyd, of 1318 tons burthen, (old measurement) left the Bengal passage, Acheen Head, on the evening of the 9th May, civil time, with a pleasant breeze and very sultry weather from the N. Eastward.

This continued for some days with squalls and variable weather at times, and sudden sharp squalls and rain, and that throughout the passage from Acheen to Madras, to which place we were bound in ballast from China. The weather continued so unsettled, although the Barometer continued high, between 29.70 and 29.90 and the thermometer never below 84°, and on one afternoon at 3 o'clock it stood at 96° in my cabin that I was led to apprehend a gale of wind during the whole passage of eight days. On the 19th May I anchored in Madras roads, and immediately received a notice from the Master Attendant to be prepared for bad weather. On the 20th May the weather was squally and unsettled from the Northward, Barometer at 29.70. In the evening the appearances becoming more favourable I did not leave the shore, but on the morning of Sunday the 21st the sea which is a sure forerunner of a gale on that coast, rose tremendously high, insomuch that I was once capsized in trying to get through the surf, and was very nearly one hour and a half in getting through the second time, with the boat nearly full of water; at noon got on board the ship, the wind then from N. N. W. blowing fresh, shipped the cable and made sail, stood E. by S. At 3 p. m. gradually increasing with thick rain at times and most turbulent sea. At 7-30 p. m., much lightning to the Eastward, but the sky gathering up thick in the Westward, and very unsettled and squally, with a furious sea. At about 8-30 a tremendous squall and a sudden shift to W. by N. Clued up and with difficulty furled the main topsail and rounded to with head to the N. Eastward, ship labouring awfully. Continued strong gale and tremendous sea till about 2-30 a. m. on the 22d, when the wind in a tremendous squall shifted suddenly to the S. W. by W. causing the sea to rise in perfect mountains and in a most confused irregular manner,—the ship then rolling and plunging that I sometimes thought she would not recover herself. About 3-30 the mainmast went over the side followed by every stick except the foremast, bowsprit and fore yard; the ship then

rolled her gunnels under. The strength of this hurricane lasted till about 8 A. M. when it become a little more moderate, but the sea running with unabated fury. Had no observation that day, but the reckoning at noon made us about 68 miles E. $\frac{1}{2}$ S. from Madras. Soon after sunset the wind and sea moderated a little, and by daylight on Tuesday the 23d, we were enabled to get a foresail bent, and set as much sail in various ways as we could, and at noon by observation found ourselves in latitude 13° 47′ N. longitude 82° 3′ E. Barometer 29.44. The breeze settled into a fresh monsoon from S.W. to S.S.E. which weather continued pretty steady till the 31st May, when at 9-30 P. M. we made the Light Vessel at the Sandheads.

State of the Barometer on board the General Kyd, during the late gale, corrected by comparison with that of the Surveyor General's Office, Calcutta.

May 21st at Noon,	29.45
at 3 P. M.	29.38
5 „	29.28
7 „	29.26
9 „	29.19
11 „	29.17
12 „	29.11
2 „	29.11
May 22d at noon,	29.18
2 P. M.	29.19
5 „	29.27
May 23d, noon,	29.42

Thermometer ranging from 82° to 88°.

Ship PROTOMELIA.—Slipped from Madras roads at noon 21st May; at 10 P. M. hove to.

22nd.—4 A. M. blowing a hurricane with heavy thunder, lightning and rain, Barometer 28° noon latitude account 12° 49′, longitude 81° 41′.

23d.—Barometer rising, latitude noon 12° 56′, longitude 82° 4′. This vessel ran, and was driven to 82° 30′ East longitude; and from 12° 49′ N. to 14° 8′ N. She returned safely to Madras.

Brig Dora, report by Capt. HARVEY, *Commanding her, to Capt.* BIDEN.

On Sunday night I experienced a hard gale about N. West, attended with constant rain, hove to with head to the Northward. *Monday*, at 4 P. M. sudden change of wind from the S. West and more moderate; at noon latitude by observation 12° 50′ longitude 82° 25′ E. Tuesday exchanged colours with the ship *Henry*, latitude 12° 56′. Wednesday 10 P. M. made Madras Light bearing S. West, but owing to the night's looking so dirty I stood off, and have been in latitude 14° 5′, found the current setting strong to the N. Eastward; during the whole I have not lost or strained a rope yarn. Yours respectfully,

May 30*th*. WM. HARVEY.

No Barometer; Sympiesometer injured with sea.—C. B.

Barque Coaxer, Capt. RIDLEY.

The heaviest of the gale commenced about midnight on Sunday, when we hove to under bare poles. 4 P. M. on Monday the gale moderated; when we made sail gradually; our Barometer was as low as 29. during the heaviest of the gale; we were as far to the Eastward. as 82°26′ by Chronometer.

The Bark Orpheus at Anchor at Ennore, forwarded by Captain BIDEN.

20*th May*.—Begins with light winds from S. S. W. and ends with strong gales from W. N. W. Barometer at 29.305 and falling.

21*st May*.—Strong gales, heavy rain and thunder and lightning, wind N. W. to W. N. W. throughout, but "*strong swell setting in from the Eastward*,"* is noted in the log at 2 P. M.; when heavy gales which continued to midnight, Barometer 29.4.

* These and the other italics are mine. The "strong swell from the Eastward setting in on the Coast with a gale blowing directly off shore, is a remarkable phenomenon, which can only I think be explained by the progressive motion of the Storm Wave. —See Eighth Memoir, p. 398, Vol. XII, Jour. As. Soc.

22*nd May.*—A. M. wind N. W. P. M. W. N. W. and West at midnight; strong gales throughout; and heavy swell *from the Eastward.* Barometer 29.3.

23*d May.*—Winds West, W. S. W., S. W. and finally S. S. W. moderating at 6 A. M. to clear weather. Barometer A. M. 29.4 and P. M. 29.5. Strong swell *from the Eastward* A. M. which is noted as going down about noon.

Coringa.—On the night of the 22d May, the French Barque *Joseph et Victor*, Captain Honey, 360 tons, belonging to Messrs. La Forque and Co. of Nantes; bound from Bourbon to Calcutta with a cargo of 1000 bags of Cloves and a good deal of Specie, was driven on shore to the Southward of the Coringa Light House. About 700 bags of Cloves have been saved as well as the crew and passengers; it was believed that much more property would be rescued. On the same day the Native Brig *Hamsamalah* of Chittagong, laden with a cargo of salt, was driven ashore 12 miles to the Northward of Coringa, one man lost. On the 26th the *Lord Elphinstone*, Capt. Crawford, bound from Madras to Vizagapatam, put in at Coringa in distress—she had lost topsail yards and all her sails in the gale which set in from N. E., veering to E. S. E. and blowing a furious hurricane from S. S. E.

The *Amelia Thompson* foundered at Sea about 80 miles E. by N. of Madras on Tuesday morning the 23d ultimo at 6 A. M. Part of the crew, consisting of the Captain and 15 men, have been saved, having been in open boats from Tuesday morning until Friday morning, when they were picked up by a native vessel, on board of which they were treated with great kindness, and they ultimately landed at Coringa on Monday last. The remaining portion of the crew, seven in number, have met with a watery grave.

Effect of the Recent Gale in the Interior.—As we had feared would be the case, we regret to say that accounts are daily being received from the interior of the loss of life and property from the recent gale and heavy fall of rain with which it was accompanied—Villages had been swept away and property destroyed to a very large amount, in value, as well in building, as in cattle and grain, &c. &c. and in addition we regret much to add, the loss of human life.—The following extract from the *Spectator* tells a serious tale of disasters.

"We regret to learn by a letter dated Poorshottapolium, 27th ult., that terrible destruction has been caused in the Guntoor district in consequence of the inundation attending the late storm; many villages having been swept away or sustained great damage by the floods which came down suddenly on the morning of the 23d. Swelled by the previous rains, *four* nullahs and *sixteen* tanks near Inacondah, overflowed or swept away their banks, causing a lamentable loss of life and property, of which the following details are given.

"*Rajahpett.*—Three hundred houses destroyed or injured, *seven* lives lost. Poorshottapolium, 200 houses injured, *seven* lives lost. Chilkloorpett, 300 houses injured, *two* lives lost. Pusmorroo, 20 houses injured, *four* lives lost. Annanarum and Toolapanee, 200 houses injured, and *seventeen* lives lost. In addition to the above damage or destruction of above a *thousand* houses, and the loss of *thirty-seven* lives, it is stated, that 2,800 head of cattle and horses and 9,000 sheep perished, and that 2,700 candies of grain were more or less injured. The whole amount of damage being estimated by our informant at above 100,000 Rupees. The total destruction occasioned by the inundation was indeed hardly ascertained, many villages having been damaged or swept away, of which no perfect account had yet been received.

"From the notices now received from distant parts of the country it is evident, that the gale and heavy rain felt here about a fortnight ago, formed merely part of a great atmospheric disturbance ushering in the South-West Monsoon, and traversing the entire peninsula from North to South, marked throughout its course by considerable, though happily only locally, destructive violence. At Delhi on the 17th, unusual weather prevailed. 'High North-West and Easterly winds and occasional storms of rain, the coolness of the atmosphere being, for the time of the year, very extraordinary.' At Hyderabad a few days later, the Monsoon set in with great violence, and at Coringa, Masulipatam, Guntoor and Pondicherry, in fact all along the coast in a North and South line, heavy gales and torrents of rain simultaneously prevailed."

We glean the following from the *Bombay Times* of May 24:—

"*The Weather.*—Since the evening of Thursday, the sky has looked so troubled, and the barometer fallen so steadily, that we supposed the Monsoon to be at hand. The wind has got round nearly to South-west, and the alternating land and sea breezes have ceased. Our sea

breeze, which blows with so much regularity from the North-west for seven months in the year, has disappeared. On Sunday evening some light showers fell, and the sky has ever since continued black and cloudy. The most singular phenomenon of all is, the remarkable and steady fall of the barometer, which has been gradually sinking for four days, and has now got to a point rarely attained by it. The following are the readings of the Observatory Standard since Thursday, when it began to fall—they are given both as read from the scale, and as corrected for temperatures, capillarity, &c. The hours are very nearly those of daily maximum and minimum :—

	4 A.M.		10 A.M.		4 P.M.		10 P.M.	
	Read.	Cor.	Read.	Cor.	Read.	Cor.	Read.	Cor.
Th. 18,	29.736	29.586	29.792	29.633	29.686	29.529	29.722	29.568
F. 19,	678	526	746	594	462	488	710	557
S. 20,	688	538	768	586	632	475	710	555
M. 22,	575	421	630	471	494	338	566	411
Tu. 23,	510	357	572	412	489	331		

" As no tempest has presented itself here, such as these indications would have inclined us to expect, we are led to infer that within the last four days a hurricane has been raging within a few hundred miles of us, the effect of which has only been manifested here on the barometer. The influence of the Madras hurricane last October was very conspicuous, but nothing like this."

" For the following accounts from Cochin and Tellicherry, we are indebted to the kindness of Capt. Biden, the Master Attendant:—

" *Cochin.*—The Ship *Hero of Malown,* which left these Roads on the 25th ultimo, was wrecked on the 26th or 27th near Alleppee—all the crew with one exception were saved, and they have arrived here this day.

" *Tellicherry.*—During the night of the 31st, two Pattimars were driven on shore a little to the southward of the flag staff, and were soon knocked to pieces by the heavy surf. On the 1st instant, another Pattimar was driven on shore to the Southward of the flag staff, and on the 2d, one was swamped at her anchors and went to pieces—the above wrecks have been caused by a heavy rolling sea."—*Madras Athenæum.*

12*th June.*—Ship Julius Cæsar, Wingate, from Aden 18th April, and Mocha 11th May.

Remarks.—Julius Cæsar in latitude 12° 51′ N., longitude 58° 28′ E. experienced a heavy gale of wind from S. E. to W. on the 25th May, which continued till the 29th, in latitude 9° 56′ longitude 66° 30′ E. Lost all our sails, and sprung the head of the main mast.—Saw the Hindostan steam ship pass Mocha on the 7th May.

At Hyderabad, the storm commenced at N. E. veered to N. W. and S. W., and then at N. W. again with a greater fall of rain than had been *known* at this season for many years, upwards of 9 inches in 36 hours. Gale commenced on the 22d, and lasted all the 23d as per letter.

Ship Hyderabad from Bombay.—The *Hyderabed* had bad weather at Mangalore on 21st, 22nd and 23rd, wind N. W. to West, much rain. Barometer fell on 21st to 29.41, rose on 21st.

Another report.—The ship *Hyderabad*, Captain Harrison, was at anchor at Mangalore at noon.

21*st May.*— Dark gloomy weather, and fresh sea breeze. P. M. N. W., cloudy and rain increasing towards midnight.

22*nd May.*—To noon fresh breeze (wind not marked.) P. M. strong gales. 9 P. M. heavy gales, hard squalls, and a very heavy sea.

23*rd May.*—6 A. M. unable to ride longer with safety, weighed at 8 A. M. with *uncertain* weather. 10 anchored again. P.M. fresh W.N.W. gales and cloudy; stood to the S. S. W. and South 111 miles, with heavy weather noon 25th, in latitude 6° 57′, having carried the same W. by N. and W. by S. Monsoon to that parellel.

The following is from Captain NEWBOLD, *Assistant Resident at Kurnool, Madras territory.*

I am sorry to say, that my efforts to obtain information regarding the storm of the 22d, 23d and 24th of May last have been unavailing, I therefore lose no time in sending you my own observations made at Yelgode, a village at the western base of the Eastern Ghauts, lying between 78° and 79° E. longitude and 15° and 16° N. latitude, sheltered on the East and North by ranges of hills at from 7 and 10

miles distance, sufficiently high, (from 500 to 1500 feet above the plain,) to influence the direction of ordinary aërial currents. These observations only go to note the fact of the storm's influence having been severely felt in this latitude so far inland, its duration, and general direction. I much regret the absence of a Barometer, particularly on this occasion, where the atmospheric depression appears to have been so remarkable, and so extensively and simultaneously felt over the greater part of Peninsular India; the fall of the Barometer having been noted at Calcutta, Madras and Bombay. From what I can glean from my correspondents, I find that its chief fury was experienced between 15° and 19° N. latitude and from 76° to 84° E. longitude.

At Yelgode it was ushered in by two days of cold drizzly weather, the atmosphere was charged with low clouds that came from the Westward and hung in wreaths on the Eastern Ghauts. The Thermometer fell from 99° at 2 P. M. the hottest part of the day to 76°. On the 22d at 8 P. M. it commenced to blow strongly from the N. and N. W., increasing at 9 P. M. to a perfect gale, attended with rain, but no thunder, which continued with little intermission during the whole of the night. The next morning, at 10 A. M, a lull took place of an hour's duration. At 11 A. M. it recommenced, rain and wind unattended by thunder, as fiercely as before, never ceasing till the following morning, the 24th, when the sky cleared. The wind however continued strong from the N. and N. W. during the day. 25th was cloudy, rainy and stormy, strong gusts of wind from the W. In the night it rained heavily with thunder and lightning. 26th settled rain, calm. 27th settled rain, light winds variable. 28th clear in the afternoon, and weather gradually assumed its usual tone. Though the storm's chief force was expended on the Coromandel coast in the latitudes mentioned, yet it was also felt on the Western coast so far South as 11°. Near Tellicherry between the 21st and 25th of May, about 15 Patimars were wrecked along the coast.

From Tellicherry *on the Malabar Coast, I have the following notice with a register of the weather at Cannanore, kindly forwarded by* J. W. Fraser, *Esq., Collector.*

I do myself the pleasure to enclose some atmospheric observations for the month of May last. You may have taken notice from the public

prints, that we had unusual and very heavy weather during the month, and much loss to the native craft on the coast in consequence, and one English ship was lost to the Southward near Cochin. With us the wind was not remarkable, May being always a boisterous month, from the surf and swell rolling in; *the tides* were most remarkably high; the bad weather also set in very early, and not from the usual quarter. I chiefly, however, forward the enclosed to inform you, that such statements are now monthly transmitted to Madras, and that I should think copies could at all times be obtained from the authentic sources should you deem such expedient.

P. S.—Many of the old inhabitants believe the bad weather they for ten days experienced and suffered so much from, not to have been the regular "Monsoon."

Your's truly,

Tellicherry, July 12*th*, 1843. W. H. Fraser.

Register of Meteorological Observations kept at Cannanore for the Month of May, 1843.

Dates.	10 A. M.				4 P.M.				Self-Registering Thermometer.					Pluviometer in inches and 100ths from noon to noon.	Howard's Pluviometer.				Whewell's Anemometer taken at 5P.M.		Weather and prevailing clouds
									6 A.M.						Dys.		Nigt.				
	Barometer.	Dry Therm.	Wet Therm.	Depression of Wet Therm.	Barometer.	Dry Therm.	Wet Therm.	Depression of Wet Therm.	Dry Ther.	Wet Ther.	Depression of Wet Thr	Maximum.	Minimum.		Inches.	Cents.	Inches.	Cents.	10ths in the scale.	Direction of the winds.	
18	29 762	85	81	4	29.688	88	84	4	81	79	2	89,5	77	0	..	..	..	..	.5	N. W.	
19	29.730	87	82	5	29.680	87.5	84	3,5	81	80	1	89	80	0	..	..	..	..	.3	ditto,	Mornings white extensive cumuli, sun out and hot, calm, P. M. Partially overcast, evening horizon dark and threatning all around, nights, calm but still and close.
20	29.756	85	80	5	29.692	89	83	6	82	79	3	85	78,5	15	..	..	..	20	·0	ditto,	
21	29.744	83	80	3	29.650	84	79	5	81	79	2	81,5	78	2.45	..	40	2	4	.5	N. N. E.	Morning overcast with dark clouds cool and refreshing airs. P. M. The Monsoon appears setting in, sky wholly overcast with heavy clouds, rain, some thunder and lightning ; evening very wet and gloomy.
22	29.676	81	78	3	29.676	80	77	3	80	77	3	81	77	1.35	..	73	..	65	.0	ditto,	Last night very heavy rain with thunder and lightning and high wind for some hours. The morning universally overcast, and frequent light showers, air cool and damp. Afternoon universally overcast, rainy and squally, night wet and gloomy.
23	29.686	79	77	2	29.612	81	79	2	77	74	3	84	74	5.95	2	36	..	39	.3	N. N. E.	Morning universally overcast and frequent light showers, air, cool and damp, P.M. Sun continues invisible, squalls ushered in with thunder and lightning, intervals between showers calm.
24	29.700	83	81	2	29.624	83	79	4	77	75	2	85	73	.40	..	38	..	..	.2½	N. W.	Morning densely overcast and universally with heavy dark clouds, raining with thunder and lightning, cool. P. M. Weather moderating, sun out, intervals of blue sky ; night mild, no wind.
25	29.744	82	80	2	29.682	82.5	80	2.5	78.5	76.5	2	82	76	1.65	..	15	1	20	.0	Ditto.	Morning fine, occasionally cloudy, sun out, calm. P. M. Sun out blue sky with white cumuli, night, wet and squally no thunder.

Bombay.—*Ship news 4th June* 1843.—Ship *Caroline*, J. Constable Master from sea.

Intelligence.—Cut away main-mast in latitude 19° 30′ N. longitude 70° 45′ W. Vessel struck by a heavy Hurricane, and on her beam-ends for five minutes, until main-mast was cut away. On sounding Pumps, found four feet water in the Hold.

I now arrange in the tabular form the logs of the different vessels at sea and on the coast, so as to show at a glance the progress of the gale, with the state of the weather at the same moment of time, as far as our records extend.

Tabular view of the Storm of the 20th to 23rd May, 1843.

Date.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
Noon 9 May, 1843.	Bussorah Merchant, .	W. by S. and fine, midnight, gale at W. by S.	° ′ 5 52	° ′ 82 12	29.56*	.. ..	.. ..	On 18th strong monsoon W. N. W. and West.
	Rajasthan, ...	S. E. by E. brisk breeze, P. M. increasing, N. E. at midnight moderate. ..	9 1	88 16	Falling,			
	Coringa Packet, ...	A. M. Tremendous gale E. by S. Noon shifted to N. W. P. M. Abating, ...	Trincomallee West, .10	.. ..	29.45	.. ..	.. ..	18th, Fine, but Barometer fell from 29.70 to 29.50, midnight 29.40 P. M. rising.
	Teazer, ...	S. W. to S. S. W. threatening weather.	12 00	18 28½	29.72	8	86	A. M. Hove to; P. M. made sail; at midnight wind S. E.
	Candahar, ...	Light breeze E. N. E. to E. S. E.	15 26	83 10				
	Euphrates, ...	Fine N. E. by E.	14 51	81 28				
	Julia, ...	Light S. E. breeze midnight steady S. E. breeze. ..	18 05	89 06	.. .. ..	.. ..	.. ..	18th, Calm and heavy clouds in S. E.—Barometer 29.75
	Champion, ...	Light breeze from the Eastward and hazy weather.	15 29	.. ..	29.85			
	Isabella Watson, ..	Close and sultry, at Anchor at Covelong.	.. .. ..	.. ..	.. .. ..	29.36	83½	Heavy swell rolling in on the beach.
Noon 20 May, 1843.	Bussorah Merchant, .	Continued heavy gale W. by S. and W. S. W.	7 20	.. ..	29.26	.. ..	.. ..	Barometer at midnight, 29.26, heavy gale.
	Rajasthan, ...	Hard gale West P. M. W. by S. and W.	.. .. ..	.. ..	29.20	.. ..	.. ..	Wind shifted to West at 4 A. M. Bar. fell 0.8 before Noon.
	Coringa Packet, ...	Moderate till midnight, when heavy gale W. S. W....	.. .. ..	.. ..	29.50			
	Marquis of Hastings,	Moderate S. by W. to W. S. W.	11 50	95 5				

* Corrected.

Date.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
			° ′	° ′				
Noon 20 May, 1843.	Seringapatam, ..	S. S. W. increasing gale...	7 30	88 50	.. .. ..	.. ..	.. ..	Heavy squalls, thunder and lightning.
	Teazer, ...	Variable from E. to N. N. E. P. M. N. W. gale....	.. .. ..	.. ..	29.70	.. ..	86	P. M. threatening and increasing to a strong gale N. W.
	Union, ...	Freshening from N. E. ...	15 1	82 37	.. .. ..	.. ..	.. ..	Steering to the Southward.
	At Coringa, ..	A. M. N. E. P. M. Easterly 10 P. M. N. E. fresh breeze...	16 51	82 51				
	Candahar, ...	N. E. P. M. threatening N. E. by East...	16 6	82 13	4. P. M. 29.60	.. ..	.. ..	Gale increasing from noon to midnight.
	Euphrates, ...	Noon North, P. M. N. E. increasing, ...	16 2½	81 40	.. .. ..	.. ..	.. ..	Midnight very threatening.
	Lord Lyndoch, ..	E. by S. to E. N. E. P. M. increasing,..	15 42					
	Julia,..	Noon increasing S. E. by E. squally P. M. E. S. E. and S. E. by E. increasing to a gale.	16 9	88 13	29 75	.. ..	86	Barometer 1 A. M. 29.72 midnight 29.50.
	Champion, ...	Lightning, squally and suspicious looking weather ...	16 9	.. ..	29.85 to 29.75	.. ..	.. ..	Heavy swell from the East saw the land off Narsapore point, At night hard squalls E. and E. N. E.
	At Madras, ...							
	Isabella Watson, ..	Hard squalls N. W. and heavy rain,..	.. .. ..	.. ..	.. .. ..	29 26	84	7 A. M. arrived in Madras Roads.
	At Ennore, ...	A. M. Light winds S. S. W. P. M. strong gales W. N. W..	13 13	80 26	29.305			
Noon 21 May, 1843.	Bussorah Merchant..	A. M. more moderate S. W. P. M. strong gale South...	9 30	.. ..	.. .. ..	.. ..	.. ..	S. Gale continuing to midnight.
	Rajasthan, ...	Fresh gale S. Wy.	8 12	.. ..	29.70	.. ..	.. ..	Midnight hard gale S. S. W.,

Dates.	Name of place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
Noon 21 May, 1843.	Tenasserim S. V. ..	Fresh breeze W. N. W. variable P. M. South and S. W.	° ′ 6 49	° ′ 78 3	4 A. M. 29.92 —.75 Noon, 29.90 —.72 4 P. M. 29.90 —.72	.. ..	.. ..	Midnight brisk gale S. W.
	Coringa Packet, ..	Terrific gale, supposed from West to W. S. W. P. M. Moderating, midnight West fine..	5 30	83 40	29.40	.. ..	.. ..	Barometer at midnight 29.65.
	Marquis of Hastings,	Squally Westward and S. W. freshening breeze ..						
	Seringapatam, ..	S. S. W. Increasing gale heavy squalls and gloomy weather.	9 10	88 50				
	Teazer,..	Wind W. by N. or West, and W. N. W. veering to S. W. Noon hurricane. ..	.. ..	.. ..	29.20	.. ..	.. ..	Noon hove to; a complete hurricane; Barometer 2 A. M. 29.70 at 6, 29.40, at 8, 29.30, Noon 29.20, 4 P. M. 29.60, midnight 29.45.
	Union,..	Gale increasing North or N. by W. to midnight. ..	.. ..	.. ..	.. ..	.. ..	.. ..	Running to the Southward.
	At CORINGA, ..	N. E. heavy squalls throughout.	16 51	82 16				
	Candahar, ...	N. E. severe gale increasing to midnight.	15 40	82 40	29.55	.. ..	.. ..	Lying to, heavy sea breaking over the ship.
	Euphrates, ...	A. M. Hard gale E. N. E. Noon N. Easterly P. M. hard gale N. E. 9 P. M. Easterly Midnight E. S. E.	14 40	82 52	28.90	28.80 ..	.. ..	[P. M. Simp. 29.80. At the commencement of the gale

Date.	Name of place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
			° ′	° ′				
21 May, 1843.	Lord Elphinstone, ..	N. N. E. to N. E. Midnight strong gale.. ..	15 45	83 15	Noon 20.	.. ..	.. ..	A. M. Barometer falling from 29.98 to 29.55; at 3 P. M. dark gloomy appearance.
	Lord Lyndoch, ..	N. E. by E. to E. N. E. strong gale,.	.. ..	.. ..	.. ..	.. ..	.. ..	Gale commenced soon after midnight at N. E. by N.
	Julia, ...	Noon S. E. strong gale, ..	13 50	86 46	29.40	.. ..	86	Barometer 29.50 to 29.48 severe gale with squalls and fog.
	Champion, ...	Strong gale (Easterly ?) P. M. drawing to E. S. E. ..	15 31	.. ..	29.70			
	At Masulipatam,..	N. E. heavy squalls and rain, ...	16 5	81 11	.. ..	.. ..	.. ..	Barometer falling.
	At Pulicat,.. ..	Gale commenced about 11 A. M. North and N. W.	13 26	80 26				
	At Madras, ...							
	Brig Bittern, *.....	At 1.30 P. M. gale N. W. ran to sea	.. ..	.. ..	.. ..	.. ..	.. ..	7 P. M. wind N. 10 N. N. E.
	Baboo, ...	2 A. M heavy gale W. N. W.	12 33	82 0	28.48	.. ..	.. ..	Ran to sea from Madras roads at 12-30 P. M. 20th gale increasing to the Eastward. P. M. wind S. S. W. to West.
	Isabella Watson, ..	Blowing very hard N. E. ..	.. ..	.. ..	.. ..	29.16	$83\frac{1}{2}$	$2\frac{1}{2}$ P. M. Simpiesometer 28.96. 8 P. M. Simpiesometer28.84. Thermometer 83.
	General Kydd,.. ..	N. N. W. blowing fresh. ..	.. ..	.. ..	.. ..	29.45 to 29.11	.. ..	At noon slipped and ran to sea 8-30 P. M. wind shifted to W. N. W.
	At Ennore,.. ..	Strong gales N. W. to W. N. W. throughout.. ..	.. ..	.. ..	.. ..	.. ..	.. ..	Heavy sea from the Eastward.
Noon 22 May, 1843.	Bussorah Mercant. ,	A. M. finer, gale from South at noon. P. M. South and S. S. E.	12 00	87 24	.. ..	.. ..	.. ..	Monsoon gale, to midnight.

* I have inserted here only a few of the Logs of the vessels which put to sea from Madras Roads; their brief reports mostly affording but few data and agreeing as to the veering of the wind.

Dates.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
			° ′	° ′				
Noon 22 May, 1843.	Rajasthan..... ..	Fresh S. W. monsoon gale..	7 48	91 45	29.60			
	Tenasserim S. V. ..	S. W. brisk gale P M. W. S. W. and S. W... ..	5 3	80 36	Noon 29.30 — 40 4 P. M. — 80 60			
	Coringa Packet, ...	Moderate and fine.						
	Marquis of Hastings,	S. W. by W. to S. S. E. squally.	14 52	93 57	.. ..	.. ..	.. ..	Cross sea from S. W.
	Seringapatam,.. ..	S. W. by S. heavy gales rain thunder and lightning.	10 0	85 30	.. ..	.. ..	.. ..	Latterly more moderate.
	Teazer.	P. M. wind S. S. W. 5 South.						
	Union, ...	W. N. W. gale.	11 25	85 10	29.60	.. ..	.. ..	From 7 A. M. moderating.
	At CORINGA, ...	A. M. N. E. 5 P. M. Easterly heavy gales and rain throughout.	16 51	82 16				
	Candahar, ...	N. E. heavy gale 10 A. M. S. E. 1 P. M. hurricane at S. E. 6. P. M. hurricane at South.	15 30	83 00	28.83	.. ..	.. ..	2.30 P. M. Hurricane at the highest, 8 P. M. Barometer 29.29 moderating to midnight.
	Euphrates, ...	5 A. M. hurricane S. E. by S. noon S. S. E. P. M. hurricane at South 7 P. M. S. S. W.	14 08	82 29	.. ..	.. ..	.. ..	6 P. M. Barometer rising, 8 P. M. Barometer 29.20. Midnight hard gale.
	Lord Elphinstone, ..	Severe gale N. E., E. N. E. and East, 1 P.M. veered from East to E. S. E. and S. E.	15 0	82 26 (?)	29.8 29.0 28.90 28.80	.. ..	.. ..	Noon terrific squalls.

Date.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
Noon 22 May, 1843.	Lord Lyndoch, ..	Noon hurricane about N. E. by E. shifted at 1 P. M to S. W.	.. ..	.. ..	.. .. ..	.. ..	.. ..	Barometer 10 A. M. 28.35 and at ¾ past noon 27.95 when hurricane veered to S. W. after a calm of ¾ of an hour.
	Julia, ...	S. E. to S. S. E. severe gale P. M. S. E. to S. Midnight South, ...	° ′ 13 47	° ′ 86 05	29.45	.. ..	86	Bar. 29.45 to 29.40 at 11 P. M.
	Champion, ...	E. S. E. P. M. hurricane from South, ...	.. ..	.. ..	29.60 to 29.20	.. ..	.. ..	P. M. lull, and drawing to S. W. shifted to hurricane at South.
	At Masulipatam,..	5 P. M. gale increasing N.E. and N. N. E.	.. ..	.. ..	29.08 to 28.76			
	At Pulicat,.. ..	Gale abating about noon. ..						
	At Madras,.. ..							
	Brig Bittern,.. ..	5 A.M. wind *shifted* to West.	12 15	82 51	29.40	.. ..	.. ..	P. M. Wind S. W.
	Isabella Watson, ..	8 A. M. furious gale N. W...	.. ..	.. ..	.. .. ..	.. ..	.. ..	3 A. M. Sympiesometer 28.64, Thermometer 83, Noon Madras by account W. by N. 70, 2 P. M. Sympiosometer 28.70, 3 P. M. 28.84 moderating; wind *flew* round from N. W. to West and at 4, S. W. moderating to Monsoon gale by 23d.
	General Kydd, ..	Abated.W. N. W. or N.W.	.. ..	.. ..	29.18 to 29.27	.. ..	.. ..	2 A. M. Wind shifted to S. W. by W. 3.30 was dismasted Noon 68 miles 8½ S. from Madras P. M. moderating.
	At Ennore, ...	A. M. N. W. P. M. W. N.W. midnight West and moderating	.. ..	.. ..	29.3	.. ..	.. ..	Strong gales throughout and heavy sea from Eastward.

Date.	Name of Place or Ship.	Winds and Weather.	Lat. N.	Long. E.	Barometer.	Simp.	Ther.	Remarks.
Noon 23 May, 1843.	Bussorah Merchant, .	S. S. W. steady monsoon gale.	° ′ 14 34	° ′ 86 30				
	Tenasserim S. V. ..	West to S. W. by W. brisk gale.	6 49	82 58	4 P. M. 29.80 —.55			
	Marquis of Hastings, .	N. W. veering to S. W. monsoon.	16 42	92 4				
	Teazer, ...	About South moderating ..	.. ..	.. ..	29.66	.. ..	86	
	Union, ...	.. ..	11 50	82 30	.. .. ..	.. ..	.. ..	Vessel founded a little before noon, near this spot.
	At Coringa, ..	1 A. M. S. E. at 3 Southerly moderating to fine at midnight.	16 51	82 16				
	Candahar, ...	Hard gale S. S. W. ...	15 38	83 20				
	Euphrates, ...	2 A. M. S. S. W. moderating to noon and P. M.	16 17	83 44				
	Lord Elphinstone, ..	5 A. M. Wind South, 8 P. M. moderating at S. S. W...	.. ..	.. ..	28.75 29.0 29.5 29.10	.. ..	.. ..	6 Lost the rudder.
	Lord Lyndoch, ...	A. M. moderating to noon, when Wind about S. W..	.. ..	.. ..	.. .. ..	.. ..	.. ..	Moderating to a strong monsoon on 24th latitude 16° 24′ N.
	Julia, ...	Noon gale from South P. M. moderating.	15 47	85 20	29.40	.. ..	86	Barometer 29.40 to 29.55.
	Champion, ...	Drawing to S. S. W. and abating to noon.	16 0	83 20				
	At Masulipatam, ..	2 A. M. wind veering to E. S. E. and then S. and S. by W. blowing violently..	16 5	81 11	28.98 to 29.30			
	At Madras, ...							
	Brig Bittern, ..	.. ..	11 36	83 25	29.40			
	General Kydd, ..	Monsoon gale.	13 47	82 3	29.44			

Chart
TO THE TENTH MEMOIR on the Law of Storms IN INDIA BEING The Coast Hurricane of 21st 22nd May 1843.

By Henry Piddington

Juggernath
Black Pagoda
Ganjam
Vizianagram
Bimlipatam
Vizagapatam
Samulcotta
Juggernaikporam
Coringa
Masulipatam
Pt Divi
Cuddalore
Pondicherry
Tranquebar
Pt Calimere
Negapatam
Pt Pedro
Trincomalee
Batticolo
CEYLON
Manaar
Pt de Galle
Dondra Head
MADRAS
Sadras
Bubon
Buffaloes
Pulicat
Coringa Packet
Coringa Packet's Storm
Probable track of the Storm
Union foundered 23rd
Centre 21st May
Centre 22nd
Centre 20th
Serringapatam
Rajasthan
Bussorah Merchant
Tenasserim
Chedubo
Khyouk Phuse
Pt. Negrais
Preparis
Cocos
Narcondam
Andaman Is.
Barren I.
Sentinel
Little Andaman
19th May
20th
21st
22nd
23rd
10th May
12th May
80°
85°
90°
95°
15°
10°
5°
20°

SUMMARY.

I proceed now to consider in detail the evidence afforded by these documents for laying down the track of this storm as I have traced it.

The first log is that of the Bussorah Merchant, which I notice to remark that she was evidently carrying a heavy monsoon from the 19th May, on which day she reached Point de Galle, to the 22nd and 23rd on which last day she had reached 14° 34′ N. longitude 86° 30′ E. steering thus as it were from the South point of Ceylon towards the middle of the Bay on those days, and before the monsoon. The next document is the log of the Rajasthan, which ship being bound to the Southward, was from the 19th at noon, when in latitude 9° 1′ N. longitude 88° 16′ East, standing to the S. S. W. with the wind from S. E. by E. to E. and N. E. At 9 A. M. on the 20th she had the wind at N. E. which at 4 *shifted* to the Westward, and was a strong gale at West by noon, the Barometer having fallen very considerably, the ship running to the Eastward.

The fall of the Barometer is somewhat loosely given as being *about* 80, but it must have been a very remarkable one for those latitudes, and I am thus inclined to suppose that this vessel had a storm passing to the Northward of her at about noon on the 20th, when she may have been in latitude 8° 35′ N. longitude 88° 55′ E. She was standing to the Eastward from 5 to 7 knots per hour, and the storm travelling the other way, which will account for the suddenness of the fall, as also that by noon of the 21st she had the storm moderating.

It was of small extent, for as seen by the chart the Seringapatam was only bringing up a heavy monsoon, about 90 miles to the South of the supposed centre for this day, which was most probably the date of the beginning of the vortex.

Passing over the curious log of the Coringa Packet and that of the Tenasserim, both of which I shall notice in another place, we have next for these days, the 19th, and 20th the log of the transport Teazer, which vessel hove to on the 19th May, *on account of the threatening weather* in latitude 12° N. 81° 28′ E.; her Barometer at 29.72 and having stood on a little again, hove to on the 20th, on which day at noon I take her to have been about in latitude 11° 18′ N. longitude 82° 40′ E. In the afternoon of this day the storm had commenced with her in a gale from

N. W. and she scudded with it to the E.S.E. We shall return to her log when discussing the place of the centre of the storm for the 21st, but I may remark here, that we can barely suppose the storm of the Rajasthan and that of Teazer to have been the same.

On the 21st, we have the Teazer with a gale from N.W. since the afternoon of the N.W. and at noon on this day, after scudding with a tremendous heavy gale from the Westward, broaching to in a hurricane, with the Barometer at 29.20, and afterwards rising. This must place her position on that day very close to the centre, and that centre about due North of her.

The ships Lord Elphinstone, Lyndoch, Candahar, Champion and Euphrates* were all on this day off the low land at the mouth of the Godavery and Kistnah, and it will be noted that the trending of the coast just to the South of their position, or in latitude 15° North, from N. E. and S. W., becomes North and South, and the high land recommences in about Lat. 15° to the Southward, leaving the valley and delta of the Godavery to form a wide extent of low land. The Euphrates, the outermost of these vessels, was at noon on the 21st about 120 miles from False Point. They had all gales from E. N. E. to N. E. with falling Barometers, and the Julia, which ship was far to the N. Eastward, and about in the middle of the Bay, had the wind at S. E. We shall thus, I conceive, not be far wrong if we consider the centre of the storm at noon on the 21st to have been about in longitude 85° and in latitude 11° 20′. There is perhaps a little anomaly in the wind marked in the log of the Bussorah Merchant, which is said to have been S.W. A. M. and South P. M. which would allow us to call the wind S. W. by S. at noon, while in strictness she should have the wind S. W. by W. or two points farther to the Westward. This is not of any great importance when we recollect that she was bringing up a heavy monsoon, and that the small storm of the Rajasthan on the 20th (if there was one) would necessarily occasion some irregularity hereabouts.

On the other side of the circle also we have some slight anomalies of the same kind, in the winds marked in the logs of the Bittern, Baboo, &c. which were evidently, at this time, in part those deflected from the

* I have marked only the tracks of the Candahar, Euphrates, and Union to avoid confusing the chart with too many of them.

shore and in part the monsoon. For the 22d we have first the logs of the ships off the mouth of the Godavery as before, all of which had had the storm commencing on the 21st at about N. E. and drawing gradually to E. N. E. and E. S. E. according to their positions.

They had it on this day, by noon, a hurricane at S. E. to S. S. E. veering rapidly to South and S. S. W. as it passed them. With the Lord Lyndoch and Champion indeed it was a *shift* of wind, but we have not unfortunately their positions to any accuracy; indeed those positions which are given, though most creditable to the care and attention of the commanders of the ships, must still be taken with much allowance; for, in the position they were, there was not only the usual causes, drift, leeway and heave of the sea operating, but moreover the "storm wave," "storm current" and probably an outset from the floods of the Godavery, all combining to affect the calculated position of the vessels. As however the whole of the ships were, like a dispersed fleet, within a circle of 120 miles in diameter, it will be seen by the chart that in placing the centre for this day at noon in latitude 15° 45′, longitude 82° 7′; we shall as nearly as possible give the ships the winds veering as they really did, as well as to the three stations of Masulipatam and Coringa, at the first and Southermost of which, Masulipatam, the storm was increasing at 5 P. M. of the day from the N. E. and N. N. E. shewing evidently that its track towards the shore was to the South of that port.

On the 23rd we have the storm moderating, with all the ships in the offing, to a regular monsoon gale, and on shore at Masulipatam veering also to the E. S. E. and subsequently to the S. and S. by W. We do not learn where the centre passed inland, as there are no European stations between Masulipatam and Ongole, a distance of 95 miles: it is probable that the centre *landed* somewhere between these two stations. I have carried my strait line near to Ongole, but not meaning thereby to indicate that we have any knowledge of the exact point at which the centre struck the shore. It was I think more to the North, as the storm would probably travel up the valley of the Kistnah.

At Madras and with the ships which put to sea from the roads of that port, the storm was, as it should be, on the Southern quadrants of a circular, one passing to the North East and North of that point, a gale veering from N. N. W. to N. W. and West, and subsiding into the re-

gular monsoon, which we must always allow for in considering the effects of a storm at this season of the year.

For its track inland, all we can say is, that it was, as appears by the newspaper report, most severely felt, both as a storm and in the shape of inundations arising from excessive rains, through the Guntoor and neighbouring districts, which are more or less in a line between Ongole and Hydrabad, and that it must have passed to the North of that city, being there first a gale from N. E. and veering to N. W. and at Yelgode, which is situated about 110 miles South of Hydrabad and thus on the Southern side of the track, it was always a storm from North and N. W.

The heavy surfs on the Malabar coast, alluded to in Mr. Fraser's letter, with the threatening weather at the ports of Mangalore and Tellicherry, and the remarkable depression of the Barometer at Bombay, are all proofs that the storm was very widely felt as to its general atmospheric influence; but we cannot for want of a date connect the dismasting of the Caroline or the storm of the Julius Cæsar with our data, from distance, time, and the want of all intermediate evidence. We may presume it not improbable that like the Calcutta storm of June 1842, it was "lifted up" by the table land of the Deccan, and perhaps descended again in the Arabian sea, but of this we have no evidence; such as we have, I have placed upon record, because it is of great importance to have even the imperfect notion which it gives of these curious passages of storms over the Ghauts.

Rate of Travelling.—We have only one day, 21st to 22nd, from which we can take any safe data for its rate of travelling at sea. The distance between these two centres is 240 miles, which gives exactly 10 miles an hour, and from the centre of the 22nd instant to a supposed point 50 miles to the North of Hydrabad, where we may take the centre to have been at some time on the 23d instant, is about 350 miles, which for 36 hours is also about the same rate. I need not add that this last datum is of course almost guess work, but it serves to shew that the storm probably had not, in this instance, experienced much retardation, in its course up the valley of the Godavery, which it seems to have followed at least for some distance.

It is then an instance, and to these researches a new one, of a storm apparently generated in the centre of the Bay at the change of the

monsoon and travelling up on a N. Westerly course, the track from the 21st to the 22d is N. 48° W. towards the low lands of the Deltas of the great coast rivers, and it forms thus a new track on our storm charts, and an addition of much importance to our knowledge.

I must not close my remarks without adverting to the very curious log of the Coringa Packet, which vessel evidently had on the 19th one of those small hurricanes (for we may so term them) which though of limited extent, are, during the short time they last, excessively severe. My readers will probably recollect that of the Cashmere Merchant off the Island of Preparis on the 21st November, 1839, which is described and delineated on the Chart to my Second Memoir, Jour. As. Soc. Vol. ix. pp. 107, 397. and that in the Sixth Memoir also there are instances of their occurring in the China seas. These sort of hurricanes are not uncommon it would appear off Ceylon, for H. M. S. Centurion was totally dismasted, and nearly foundered in one on the 4th December 1803, which lasted only a few hours; and I have other instances of the kind on record amongst my materials for a Memoir on "The Old Storms of the Bay of Bengal."

The rise of the Barometer when the water spout had passed under the stern of the Coringa Packet, and the heavy rain which it brought with it, are facts of much interest. The gale of the 21st I consider to have been the usual monsoon one, as though severe it was accompanied by a rise of the Barometer. The hot and cold blasts noted in the log of the Lyndoch, and the fact that Masulipatam was inundated from the sea, are also of much interest. The Lyndoch's Latitude on the 30th has been by mistake printed 18° 42′, it should have been 13° 42′.

An Inscription from a Tablet in a Buddhist Monastery at NINGPO *in* CHINA. *By* D. J. MACGOWAN, *Esq. M. D. Surgeon of the Ningpo Hospital. With a Plate.*

We have lost no time in lithographing this curious inscription, so as to submit it to the learned. We have, we think, recognised two of the characters in the Lama formula of OM-MA-NI-PUD-MI-OM as written in the Uchen character, of which a plate will appear in the next or following number, accompanying remarks by Lieut. Cunningham, B. E. on Moorcroft's Travels, &c. We incline to the opinion that the tablet will be found to be a mystic form of the Buddhist Lama's ejaculation in which

perhaps the elements of the letters have been subdivided? or are written in their primitive forms? To Dr McGowan's closing paragraph we heartily respond, and our readers will have seen that the Asiatic Society has not been wholly inattentive to the great field of research which is opened in China. We trust that amongst the many Europeans of learning and talent who are now resorting there, it will not be forgotten that our Journal and Researches offer a ready means of publication.—Eds.

The tablet is of wood painted black, the characters are red. It is about six inches square and is placed in a small frame. A light is kept burning constantly before the Tablet, which is regarded with great veneration.

At the margin is an inscription in Chinese, of which the following is offered as a translation :—

"A mysterious Tablet to dispel the evil influences of northern realms."

The priests in charge of the temple can give no further information concerning the Tablet than that it has been in their Temple for more than a century.

The priesthood, as well as all foreigners who have seen it, are anxious to ascertain to what language the characters belong, and if possible to obtain a translation. It has been shown to many philologists in China, but none could throw any light upon it; some supposed it to be Thibetan, but Dr. Hæberlin of this city informs me that he cannot recognize in the inscription any one of the three form of characters which have been or are now employed in Thibet.

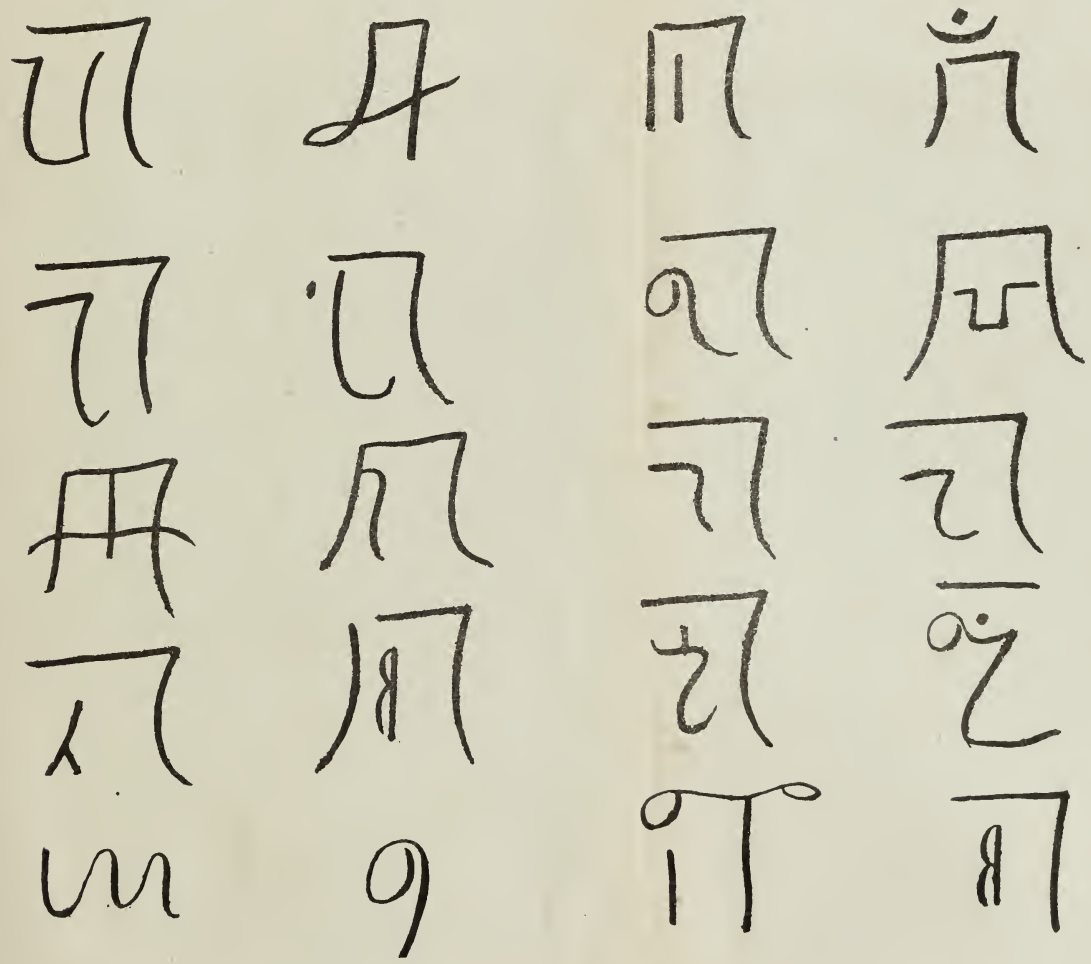
With this explanation I take the liberty of presenting the accompanying copy of the inscription to the Asiatic Society, trusting that some of its learned members may be able to decipher it.

The investigations of the members of that institution have been pursued with so much zeal in India, and have been attended with so much success, that there is abundant reason to hope that it will not be inattentive to the great field for scientific research which has been opened in the neighbouring empire of China, perhaps at the present time the most interesting part of Asia to orientalists.

Danl. J. Macgowan.

An Inscription from a Tablet in a Buddhist Monastery at Ningpo in China

Communicated by D. J. Macgowan Esq^re M.D.
Surgeon of the Ningpo Hospital.



A Description of the Country of Seisthan, By Lieutenant R. Leech, *Bombay Engineers, Assistant on a Mission to Cabool. From the Political Secretariat of the Government of India.*

The first published description of Seisthan appeared in Vol. ix. No. 103 of this Journal: it was by the late Lieut. E. Conolly, and was followed in No. 112, by a Journal of his route. Our readers will find a comparison of this notice with Lieut. Conolly's far from uninteresting, as corroboration of the sound observations of both Lieut. Leech and his predecessor in this isolated, and unknown tract.—Eds.

Description of Seisthan.

The ancient name of this country by the Hindoos was Shivasthan (शिवस्थान) and it is said to have had many Kings of that Sect, of whom the most famous was Rajah Saspal; the Mahomedans called it Zabulisthan, and boast that it produced the father of Rustom. The country has never recovered from the waste to which it was laid by Tamerlane.

Tribes.

The Seistanees are divided into three tribes; viz. the Kaiyanees, the Sarbandees, and the Sarkees.

Boundary.

The boundaries of Seisthan, are Jalalabad, Nasirabad, Zerkoh Sekwa, Dashtak, Burj Alam Khan, Janabad, and Jalalabad. The western boundary is the Koh-i-Khaja, on the top of which is the ruin of a populous city said to have been captured from the infidel Hindoos by the fabulous Rustom; the place is inhabited by a tribe called Arbaba, in small families, having no chief. This is the fort from which Nadir Shah was obliged to retire after a two years siege. This hill fort is situated in the lake of Amoo, into which the streams of the following valleys discharge themselves, viz. Arghastan Zarnak, Arghandav, Helman, Khash Rodh, Zarnak Adraskan, Rod-i-gaz. In the time of Norshirwan the Just; Kila-i-beest was the northern boundary.

The Seistanees are said to have torn the mandate of the Arabian prophet, and to have been cursed that they should never reign themselves, or enjoy peace under another reign.

Domestic Animals.

The domestic animals of Seistan, are cattle in abundance, Dumba Sheep and Goats: there are no Buffaloes, and Horses

and Camels do not live long, on account of swarms of white flies that attack them.

The country is flat and sterile in general; rice, wheat, and barley are however produced in some parts. Produce, &c.

Among the fruits, grapes are scarce, and Melons of both kinds plentiful and good.

The wild animals are hogs and hares, of which there are a great abundance, jackals, foxes and others (in lake Amoo.) In the same lake, are also fish of a large kind, and wild fowls in great number, among which is a large bird called Koo (3″) 3* of which are caught on an average a day. The down of this bird is much esteemed for stuffing pillows, it is sold in Candahar for — Rupees the Tabreez maund. About 300 others are also caught a-year, a large skin being sold in Candahar for 8 Rupees; about 3000 other wild fowl are caught a-day on the lake in the following manner:— Wild animals.

The lake for some distance from the shore is covered with reeds, and each fowler has his own fowling ground; spaces are cleared in the reeds in which the snares are set. The water of the lake being clear the fowl are able to distinguish the small fish on which they feed in these small pools, for which they dive, and thus are caught. Method of catching wild fowl.

The inhabitants of Seisthan are for the most part Sheea Muselmans. There are few Hindoos and a few Belochees (who are Sunnee Mahomedans.) Creed.

The language of Seisthan is broken Persian. In a vocabulary of tow hundred and fifty words I only failed to trace the following to Persian, viz. gocha, a boy; kenja a girl; maka, mother; khurroo, a cock; kara, kind; magas, a calf; toor murgh, a cooked egg; khaya, a raw egg; dokh, unburnt brick; kang, back; kul, breast; lambas, cheek; damakh, nose; galov, melon; katic, cooked meat; koodh, deaf; kul, crooked; bapeer, grandfather; too in tabare; there, garang, heavy, paz; cook (imperative) baghan; make smooth, (imperative) tertarata, nine (9); zyada, thirteen (13.) Language.

The principal men of Seistan are as follows viz. Principal men.

Jalaladeen Khan, of the tribe of Kanjanœ (the tribe of the former

* Note.—So in MSS.

Royal family) he has a brother Hamza Khan, both are sons of Bahram Khan, and grandsons of Suleman Khan, descendants of Malic Mamood Seistanee, Shah of Meschid; he holds the fort of Jalalabad containing 500 houses, Bangar 400 houses, Shaitan 50 houses, and other smaller forts; he could collect 3000 men all armed with matchlocks. He some time ago, gave the daughter of his deceased uncle, Nasir Khan, in marriage to Shah Kamran, with whom he is on friendly terms, and assists him with men, when required. About four years ago Mahomed Razad Khan, Sarbandee Seistanee, and Aly Khan the son of Khan Jan Saiyaranee Baloch, by Mahomed Razad Khan's sister, and Hasham Khan Sharkee, of Seistan, joined their forces, and expelled Jalaladeen from Jalalabad, Nasirabad, Kackhoon, &c. &c. forcing him to take refuge in Joaeen, a place belonging partly to Seistanees and partly to Polalzais. The Jalaladeen despatched his son Nasir Khan to Kamran for succour, who granted it, invaded Seistan and reseated Jalaladeen in his possessions. The chief has lately adopted the Sunnee creed.

Hamza Khan. Hamza Khan was formerly at enmity with his brother, the above-mentioned Jalaladeen: but was reconciled to him by Shah Kamran, and is now subject to him. He has married the sister of Mahomed Razad Khan, but he and his brother are not on good terms with the latter, neither are they so popular in Seisthan as he is.

Mahomed Razad Khan. Mahomed Razad Khan Larbandee Seistanee, has the districts of Sekwa Husenabad, Pusht i Dasht Shiling, Warmal Doulatabad, Chung i Murghan, Burji Hajie, &c. &c. He could collect 5000 men, 100 of which would be cavalry. He is on friendly terms with Aly Khan Sanjaranee Baloch, who has lately taken the fort of Chalknasoor from Kamran, since the latter has been besieged by the Persians. Lulf Aly Khan, the son of Mahomed Razad Khan, was a hostage with Kamran, he was released with the sons of the other Seistanee Chiefs in the Shah's late campaign against Candahar; Kamran has given one of Mahomed Razad Khan's daughters in marriage to a son of vizir Yar Mahomed Khan, and has himself married a sister of Aly Khan's. Before Kamran invaded Seistan, Mahomed Razad Khan was on good terms with the Sirdars of Candahar, and in the war between Kamran and Persia, is neutral.

Hasham Khan Sharkee, Seistanee, holds Dashtak, Palgee, Kimmak,

Hasham Khan. Wasilan, &c. &c. He could collect 400 men, he is of old a dependant of Shah Kamran, and gives succour of troops and not tribute; he is on good terms with the Balochees, and has a superficial friendly intercourse with the Sirdars of Candahar.

Ardab Husena was governor of Khash. Kamran took the place four years ago and him prisoner; he afterwards set him at liberty and gave his daughter in marriage to Ghulam Khan, son of Ata Mahomed Khan, the Chief of the Alakszais. Arbab Husena was formerly tributary to Khan Jan Baloch, he has now a superficial intercourse with Candahar.

Chalknasoor was formerly under Meer Alam Khan, Noorzai, the brother-in-law of vizier Tottah Khan, he also held Khash and Kada, he was afterwards killed at Jugdalik,: Vizier Futteh Khan then gave Chalkhnasoor to Khan Jan, Baloch, for marrying a cast-off mistress, called Bajie.

Ally Khan is on good terms with the Sirdars of Candahar; he does

Ally Khan. not pay tribute or deference to them, one of his sisters is the wife of Shah Pashand Khan, Governor of Lash, and another has married Assadullah Khan of Kain, (a place famous for Saffron) the son of Meer Alam Khan, Kainie.

Kada is almost desolate, it is held by Arab Husen Khan.

Three miles from Janabad are the ruins of several towns, called

Coins. Boonak, where old Coins are found, as also at the ancient seat of the Kairjanee kings, Jarakoo, four miles from Burj Alam Khan.

Dost Mahomed Narvooce, Baloch, could collect 400 men; he holds

Dost Mohamed Narvooce.. Burj i Alam, &c. &c. He married the sister of Razad Khan, and gave his own sister to Aly Bhan, Baloch, he is under Kamran.

There is a road from Candahar to Seistan, through Greeskh, as follows:—

Candahar.

Kishki Nakhud,	40 Miles.	several villages of Noorzais.	Sets of Springs.

Greesk.

A strong fort, Government of Mahomed Lideek Khan.	40 Miles.	A large Town of Panchpaees.	Helman River.

Chàe, Dewala, ..	20 Miles.	No houses, 1 well on the road.	
Chàe, Kurkee, ..	20 ditto.	ditto, ditto,	ditto.
Chàe, Hasaddee, ..	ditto.	ditto, ditto,	ditto.
Fort of Kash, ...	16 ditto.	400 houses of Arbabzais.	River of Kash.
Kadah, ...	46 ditto.	300 houses of Arbabzais.	ditto, ditto.
Chalknasoor, ...	16 ditto.	500 houses of Meer Tajacks.	ditto, ditto.
Janabad, ...	16 Miles.	400 houses of Baloch and Seistanee.	A large river, the different rivers of Seistan having joined.

Here the road divides into two, the right is:—

Jalalabad	10 Miles.	400 houses of Seistanee Kaiyanee.	A large river, ditto.
A ford of Afzalabad, ...	16 Miles.	200 houses of Arbabzais.	ditto, ditto.
Hohi Khaja in the lake by water.	10 Miles.		

There is another road from Candahar to Seistan, through Garmser, as follows:—

Candahar.			
Band i Timur, ...	20 Miles.	Several forts of Isadezais.	River of Arghandav.
Kila i Sha Meer, ...	12 ditto.	A small village containing salt pans.	ditto.
A Desert.			
Gumbat, ...	40 ditto.	No houses,	River of Helman.
Hazar Juft, ...	24 ditto.	Scattered hamlets,	ditto.
Myan Pushta, ...	12 ditto.	300 huts of Balochees, in the Spring.	ditto.
Lakkee, ...	20 ditto.	400 huts, all the year, 1000 in the Spring of Balochees,	ditto.
Sappa,...	16 ditto.	200 huts of Kanozais,	ditto.
Behadar,...	12 ditto.	100 huts of Noorzais,	ditto.
Be Nadir i Lateef, ...	8 ditto.	Ditto,	ditto.

Deeshoo, ...	24 Miles.	400 huts of different tribes,	River of Helman.
Pa Lalak, ...	8 ditto.	100 huts of Balochees Baretsees,	ditto.
Hila i Islam Khan, ...	32 ditto.	100 houses of Noorzai Balochees,	ditto.
One stage on the road,			
Dak Delee, ...	50 ditto.	No houses,	ditto.
Sakwa belonging to Mahomed Razad Khan, Seistanee.	24 ditto.	ditto.	ditto.

(Signed.) R. Leech,
Assistant.

Date. 1839.	Names of Places.	Distances. Bsh. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
June.	Kandahar,						Left Kandahar at 7 o'clock on the evening of the 21st June, from camp near the Herat Gate.
21	Kokaran,	7	0	0	The river Arghand at within 500 yards of the high road, and an irrigation channel, furnishing also an abundant supply of water. Ground for the encampment of a considerable force might be taken up here in a strong position.	The Jowassa plant and grass abundant. Bhoosa (chopped straw) and Lucerne also procurable, but in no great quantity, the greater portion having been carried into Kandahar for sale to the British Army now encamped there.	The first three miles of road pass through the surrounding enclosed gardens and suburbs of the city, and the road crosses the several canals drawn from the Arghandab for irrigating the valley of Kandahar; arrangements should be made previous to the march of any large force in this direction for widening the narrow portions of the road, and sloping down the banks of the water-courses, or what would be better, bridging them. There are two roads, if not more, by which troops and baggage may pass through the suburbs in this direction.
22	Sunjeree,	5	0	0	Water procured from an irrigation canal drawn from the Arghandab, the river one mile distant S. E. of the encamping ground. Ample room for the encampment of the largest force near this village.	Sufficient forage for the camels and horses of a large force at the present season. Bhoosa and Lucerne also procurable.	The road stony in some places, but generally good; an abrupt descent into the bed of the river which would give a morning's work to forty Pioneers to render easy for heavy guns; the ford across the Arghandab easy. The river at this time does not exceed $2\frac{1}{2}$ feet in depth, it having fallen about six inches since the latter end of May. A ford about three quarters of a mile lower down the river is generally pointed out as the best for guns to cross at, and the eighteen pounders passed the river at this point in May 1839, but this ford is to be preferred as crossing the river above the point where several irrigation channels are led from it, which render it troublesome to convey large guns across the low plain on the right bank of the Arghandab. In times of flood, and whenever the depth of the water in this stream exceeds three feet, it must on account of its great velocity, prove a serious obstruction to travellers. It is however stated, that the river never remains at this height for more than a day or two at a time. It is fordable generally almost everywhere. The stream is at this season about 40 yards wide; beyond the Arghandab one or two artificial water-courses have to be crossed, and the labour of a few Pioneers would be required to facilitate the passage of heavy guns.
Carried forward,..		12	0	0			

Date.	Names of Places.	Distances. Bsh. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
June.	Brought forward,..	12	0	0	N. B.—The two marches above noticed, might without much difficulty be made in one by a small force, where time was an object; but under ordinary circumstances, it would be desirable to allow a day for the Artillery and heavy baggage accompanying an army to cross the river, particularly if the river were in flood.		
23	Houz-i-Muddud Khan,..	14	0	0	The same canal that supplies water at Sunjeree, runs nearly parallel to the road the whole of this march, and affords an abundant supply about half a mile south of the reservoir now dry. Ground for the encampment of a large force, level and ample.	Jowassa for camels in abundance; grass in the immediate vicinity of the camp rather scarce, but plentiful a few miles to the southward in the direction of the river, distant about 5 miles. Several villages (and for Khorasan) much cultivation in the vicinity; some large flocks of sheep and goats observed.	The road lies across a hard level plain across which a Brigade might move in line; water is found close to the road a short distance beyond the village of Budwan, 2½ miles from Sunjeree, and a force halting at the former instead of the latter village, would divide the stages more equally, shortening the last march, which is not however distressing on account of the excellence of the road.
24	Kooshk-i-Nakhood,	15	6	135	N. B.—The foregoing distances not measured for want of a Perambulator, they are taken on estimate, aided by the sketch of a route to Girishk, surveyed by Captain Patton, of the Quarter Master General's Department. Water supplies from two khareezees, (artificial water-courses,) good and abundant. No water found on the road though the beds of several small water-courses quite dry, except after heavy rain, for a short time are crossed on the march.	Jowassa plentiful, grass scarce, but little cultivation near the encamping ground. A village of some note called Maimund lies about ten miles to the N. of the encamping ground, in which direction also a valley opens at some distance, said to be well cultivated.	A hard, level, gravelly road without obstacle or difficulty. At the distance of ten miles from Houz-i-Muddud Khan, the road closely approaches a range of hills of trifling elevation, beyond which a higher range runs in a N. E. and S. W. direction.
25	Khak-i-chapan, ..	9	5	178	Ample ground for a large camp. Water procurable from two kahreezees in sufficient quantity for a considerable force, but it is not so	Forage for camels less abundant than at the other halting places on this route already passed and grass scarce; cultivation and vil-	The road generally good and level, and lies rather deeply on it for a short distance, and some slight undulations in the ground met
Carried forward,..		51	4	93			

Date.	Names of Halting Places.	Distances. Bsh. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
June.	Brought forward, ..	51	4	93	cessity of posting Guards to prevent waste or pollution. The ground for encamping is somewhat irregular, but no difficulty would be found in arranging the disposition of a large camp.	lages with gardens lie two or three miles to the South of the encamping ground, and several large flocks of sheep observed on the march.	with towards the end of the march.
26	Left Bank of Helmund R.	22	3	58	Water abundant, as well from irrigation channels as from the river. Ground for the largest force to encamp on available, either on the low meadow land near the river, or on the dry plain above.	An ample supply of forage for camels and horses: very little cultivation on this side the river, and but few dwellings, and excepting the villages of ferrymen, no inhabitants observed.	Road generally good and hard, the first part slightly undulating, and one or two sandy patches; about half way is a well, with a scanty supply of water, sufficient for a few travellers, but not to be mentioned in calculating on the movements of even a small force. Further on, are the remains of a garden and artificial water-course, neglected and suffered to fall to decay within the last few years. It would not it is said, be a work of much labour to re-open the water-course, which would allow of this long march being divided; a line of 100 laden camels made this march in nine hours.
27	Gerishk, R. of Helmund. ..	1	4	0	Water from irrigation channels abundant; the river a mile distant to the South-east. Ground for an encampment sufficient, somewhat broken by watercourses and damp spots.	Forage both for camels and horses excellent, and most abundant. Many small villages and much arable land, but comparatively little cultivation; nevertheless the produce of the valley of the Helmund is said to be considerable, but the supplies for 500 of Shah Shuja's Infantry now encamped here, are procured from Kandahar. It cannot however be doubted, that considerable supplies of grain could be procured in this vicinity in ordinary seasons, if necessity compelled a resort to vigorous measures.	Crossed the Helmund River at a point nearly a mile above the usual ferry. The stream is barely fordable for Infantry taking off their arms and accoutrements, and with a strong wind and ripple on the water, could not be deemed fordable at the point where the detachment crossed it. There are however easier fords within a short distance, higher up the stream. Laden camels crossed the river with ease.
Carried forward,..		75	3	151	Its depth was about 3 feet 9 inches, width of the widest branch 70 yards, there being two or others shallower and narrower; velocity of current 3 miles per hour. Since 21st May, this river had fallen upwards of four		

Date.	Name of Halting Places.	Distances. Bsh. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
June.	Brought forward, ..	75	3	151	feet. At that time the stream was crossed by rafts made of rum kegs, which were rowed across by Sappers, but in the event of it being again necessary to cross a force at the time the river is in flood, it is suggested that a suspension bridge of ropes, supported on trestles should be thrown across, the conformation of the banks immediately above the ferry presenting a favorable locality for constructing a bridge of this description; four 5-inch or 5½-inch ropes, with treble blocks, and a few stout spars, (with the lighter lines and gear to the platform, (most of which could be procurable at Kandahar,) would be a sufficient provision for the purpose. The fort of Girishk is an insignificant place, the defences might be taken off by 9-pounders, were this preliminary found necessary, and the place carried by escalade, or a favorable spot where there is no ditch selected for mining, and the wall trenched without difficulty. The gateways also are weak, and the gates of wretched construction. At a short distance from the river, cultivation ceases, and a high gravelly bank, with an almost desert plain above it, extends for several miles to the Northward.		
30	Zeeruk, ..	20	7	85	Water procurable from several kahreezees; water good and abundant; an open plain for encampment.	Forage for horses and camels plentiful; some cultivation in the vicinity, but not to so great an extent as to promise supplies for a single regiment. Fuel here, as at the former halting places on this route, is scarce, the dried bushes found on the plain being almost the only fuel procurable, at most, at the stages; however there are mulberry trees, which would only be used in the event of a greater deficiency of firewood than need be apprehended.	The first six miles of the road on this stage stony and undulating: the beds of several torrents which drain the desert plain crossing the line. After thus much of the road is passed, it becomes level and easy till the fort of Saadaat, 18 miles from Girishk is reached. Beyond Saadaat, the road again passes over undulating ground, within two steep slopes till Zeeruk is close at hand; we passed the fort of Saadaat about midnight, and by the imperfect light, it was difficult to examine the place so closely as was desirable. It appears however to be a strongly planned little *ghuree*, surrounded by a dry ditch, formidable from its section, and the very hard gravel in which it is excavated. The fort was abandoned and the gates removed; but otherwise seemed in good repair. The form of the fort was oblong, with round towers at the angles and on the sides, about 180×140 yards; the ditch enclosed a space of nearly 300×200 yards, the space between it and the walls of the fort being intended to protect cattle and horses from a hostile force. The accompanying marginal section is submitted as an approximation to the truth. There is an abundant supply of water at Saadaat, and a large force might halt there, in preference to proceeding 3 miles farther to Zeeruk.
	Carried forward, ..	96	3	16			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July	Bt. forward	96	3	16			
	Dooshakh,	12	7	76	Water from kahreezes good; abundant ground for the encampment of a large force available. Passed a kahreez with water flowing from the town of Lur.	Jowassa and grass plentiful; one or two villages and some cultivation in the vicinity, but the villages were deserted, and no supplies could be expected.	The road hard and level the whole way. At the village of Lur, six miles from Zeeruk, water and forage are procurable, and if Saadaat were made a halting place, Lur would form another, at a distance of 5 miles from it.
1							
2	Kooshki-Suffeed,	21	7	195	Water abundant from two or three kahreezes; ground for encamping rather irregular close to the village; ample room available a short distance to the West.	Good forage for the camels, grass for the horses, more cultivation than we have seen since leaving Girishk, there being several villages in the vicinity. It is possible that some small supplies might be collected here, if compulsion were resorted to.	The first part of the road good and level; excellent water from a kahreez, found at a distance of 3 miles from our encamping ground, and to a force halting at Saadaat and Lur, this would form a third good halting ground, at a distance of 10⅝ miles from the place last named. At a distance of eight and a half miles entered a range of hills, the path leading over which shortly afterwards became contracted in several places, so much, that a laden camel could barely pass. The ascent gradual, no steep slopes; the road broken and stony; the character of the hills on either side smooth, gravelly, and not abrupt, except occasionally, when the naked rock projects above the surface: this is mentioned as affording a tolerably sure indication, that difficult places in the beaten track might be turned by previous inquiry being made. The apparent summit of the Pass, judged to be about 900 feet above the level of Dooshakh, was reached at a distance of 3 miles from the base, and from this point to the end of the march, the road wound among declivities, and followed the beds of water-courses, passing over much difficult ground. The march proved a very distressing one to the camels, and occupied 13½ hours; but by daylight it is probable easier paths might have been selected. Vegetation in the bed of the water-courses was very luxuriant, indicating either the recent presence of water in the bed, or its nearness to the surface. Tall reeds and tamarisk bushes abounded in the hollow places, and the hills were dotted over with a great many Khunjuck trees. We were informed that another route lay to the westward of the path we pursued, stated to be shorter, easier, and better supplied with water. The route thus pointed out is entered in the map, and is as follows: From Dooshakh to Kurree Khan 6 miles, where there is water: from Kurree Khan to Ujrum 4 miles, water; from Ujrum to a shêla or pool of water called Guswâp 4 miles; from Guswâp to a point half way between Khoosk-i-Suffeed and Washere, 8 miles, water; from the above point to Washere 5 miles. Total 27 miles. By the road we followed the distance is 35 miles. In its present state, the hill path we came over is not practicable for Artillery, but it might be rendered so without great
	Carried forward, ..	131	2	67			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July.	Brought forward, ..	131	2	67	labour, the other road is said to be free from obstacles, but the information obtained on this head is not quite satisfactory.		
4	Washe.	9	5	215	Abundance of water from kahreezes. Ground for encampment irregular, but not otherwise objectionable.	Jowassa and grass plentiful. Many villages in the vicinity of Washere and several gardens; supplies for small parties of travellers are it is understood procurable here, and with previous arrangement and preparation, a few kharwaas of grain might be collected at Washere.	The road runs down a valley with several small villages and enclosed gardens in it, watered by kahreezes led in an oblique direction down the sides of the slopes. The water-course at the bottom being quite dry. The road is hard and good, with a gentle descent the whole way till within a mile or two of Washere, when it is undulating and stony in some places; there is however no obstacle of importance.
6	L. Bank of Khashrood	12	2	97	Excellent water from the river. Ground for a large camp not good, much broken, stony and irregular, but no real difficulty would exist in making a sufficiently convenient disposition.	Forage for camels abundant on the banks of the river. The grass met with not plentiful, and did not appear of good quality. No villages in sight, and the country on either side the river dry, stony, and almost a desert.	The road stony and uneven; at the distance of a mile came on the course of a small stream called Ausiaub, and followed its course for nearly six miles down a narrow valley lying between low hills. The last four miles of the march, the road winds down a dry water-course, road not good, but practicable for Artillery; the descent into the bed of the Khash road steep and bad. Looking up the valley of this river a succession of ranges of mountains, the most distant of which are very lofty are visible to a distance of at least fifty miles. The bearing of the highest peaks about 30° E. of N.; the general direction of the chain apparently E. and S.
7	Ibrahim Jooll, ...	16	7	188	Water abundant, ground for a large encampment not good, the banks of this small stream being high, irregular and stony.	Jowassa not very plentiful, but sufficient for a small force, grass and reeds procurable in the bed of the stream. Bhoosa obtained from villages a few miles distant. Fuel as elsewhere, scarce; but if thought requisite, a stock might in two or three days be procured from the neighbouring hills.	Forded the Khash road, a river formidable during floods, and detaining caravans several days on such occasions; at this season it is 37 yards wide and 18 inches deep, and has a current of 1¼ mile per hour. Its banks however bear all
	Carried forward, ..	170	2	127			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July.	Brought forward, ..	170	2	127	the marks of having at times to sustain the rush of an impetuous torrent; beyond the river the road pursued a tortuous course among low hills of conglomerate for about three miles, at which distance a small spring is found a few hundred yards to the north of the road; beyond this point it leads across a hard level plain for about nine miles without any obstacle beyond the dry beds of two considerable torrents. Then at the termination of the plain entered a range of hills of moderate elevation, the path being in some places narrow and difficult, and crossed in many places by the dry beds of mountain torrents. The march proved a very fatiguing one for the cattle, their labour being much increased by a strong N. W. wind, which from this date almost invariably got up an hour or two after noon, and continued to blow from the above quarter till morning during the remainder of the march. The Kohi Doozdan, a large insulated mountain which has been visible during the last three marches was passed to-day, we left it to the south of the road, and the present encampment is immediately below a very lofty and large mountain called Spundow, (Isfundear?) also visible from a great distance.		
8	Nullukh,	13	4	10	Water from a running stream good and abundant. Ground for a large encampment sufficient.	Forage for camels and horses plentiful; very little cultivation near the encampment, though some passed on the march.	The encampment is on the bank of a small stream called the Cherra. The road after leaving our last encampment lay among hills for a mile, then debouched on a plain skirting a range of precipitous and lofty hills for 3½ miles; road good, again turned into another mountain gorge, and ascended the valley for 5 miles to a spot, called Guneeemurgh, where there was a plentiful supply of water from a kahreez, and lights from khails or villages were seen. The road continued to thread a succession of mountain valleys without any abrupt slopes, either ascent or descent, over rather difficult and broken ground till the end of the march, which was accomplished by laden camels in 7 hours.
9	Foot-i-Kusurman,	6	5	95	Good water from a kahreez. Sufficient ground for encamping a large force, passed water on the road at a village called Cherra, where there is also a small fort, and others (all contemptible) seen to the west of the road.	Forage for both camels and horses abundant. Fuel procured from the numerous dry shrubs near the encamping ground. There was some cultivation in the Cherra valley, but none nearer our camp, the country could not afford supplies.	Road among hills the whole way, but not difficult, very high mountains towering before us, the road ascending gradually as we advance towards them.
	Carried forward, ..	190	4	12			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July.	Bt. forward	190	4	12			
10	Sarjwurd Kahreez,	15	0	59	Water from the kahreez good and abundant. Ground for a large encampment irregular, but sufficient.	Plenty of jowassa for the camels, grass rather scarce. There are several villages near the camp, but the inhabitants seem all to have fled. In detached patches there is some cultivation near our present ground.	A difficult road. After leaving Foot-i-Kusurman the road pursues a Northerly direction for about two miles, then turns to the Westward and follows the course of a mountain valley from $3\frac{1}{4}$ of a mile to 2 miles wide, bounded by lofty and rugged peaks on either side. At the distance of $5\frac{1}{2}$ miles from Foot-i-Kusurman, the summit of the Pass which is supposed to be full 1200 feet about the last encamping ground is gained. The path then descends, and towards the foot of the slope water is found in the bed of a stream completely overgrown by long grass, bushes, and rushes, here the valley widens out to 3 or 4 miles; and the road continues tolerably level till Lurowurd Kahreez is reached. The road over the Pass much broken, crossed by numerous beds of torrents, and in some places very stony. Laden camels would find crossing this Pass by night very inconvenient, by daylight little difficulty is experienced, the march having been accomplished by them in 7 hours; for Artillery the road in its present state is not practicable; but there is no obstacle on the road which the labour of a company of Pioneers might not remove or remedy in two days. If it were necessary to bring guns by this route, they should not be carried up this hill Pass till the road had been improved and reported on, and even then it is probable a strong working party would be required to drag them across the more difficult places. These hills are thickly sprinkled with Khunjuck trees, and many bushes fringe the water-courses; very lofty hills, their height above the level of the sea being estimated at 10,000 feet, rise to the right and left of the road in crossing the Pass.
11	Sheheruk	15	5	115	Abundance of good water for an encampment. Level plain for the encampment of a large force.	Jowassa and grass plentiful, villages and cultivation near, but the inhabitants not willing to sell supplies on any terms.	The road commonly adopted by cafilahs going by this line to Herat is to the Northward of that adopted by our party on this march; it passes by Cheekan, crosses the Furrah road at Doulutabad, and falls again into our line of march, at or near the spring of water called Chah-i-Jehan. The first four miles of road passing over undulating ground, then entered a low but very rugged range of hills, through which the road wound for about two miles; a second range of low hills met with eleven miles from Largebur Kahreez, is crossed without difficulty, and at the twelfth mile the road enters upon the hard level plain which extends for 27 miles to the banks of the Furrah road. The chain of hills on the end of which we came at Foot-i-Kusurman, runs parallel to our line of march, the remarkable peaks called Punj-angoosht, are included in the range, and are seen several miles to the
	Carried forward,	221	1	186			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July.	Brought forward, ..	221	1	186	left. A break in the range occurs a few miles to the west of the Punj-angoosht, the hills retiring to the southward forming a valley, said to be highly cultivated, in the gorge of which is situated the village of Sour; two others were also seen under the range, but night closing in, prevented their position being ascertained.		
12	Shaeewan,	15	2	175	Numerous canals for irrigation. Ground for encampment broken by water-courses and enclosures near the villages, but at a small distance from them ample room.	Abundant forage. The banks of the Furrah road on which we are, very thickly dotted with villages and much cultivation at this point. We are informed, the valley is equally fertile and productive as far as Furrah, 40 miles down the stream. Supplies of grain for our party were procured here without difficulty. Fruit was cheap and very plentiful. It cannot be doubted, that if depôts were previously to the march of an army established at convenient spots on the banks of this stream, partial supplies for an army might be collected. At Sheherut, a field of wheat had just been reaped; at Shaeewan, the harvest had been completely gathered for some days.	For ten miles the road passed over a hard level plain, then slightly undulating ground was met with as we came on the alluvial soil of the river, and from this point to its banks water-courses and cultivation were frequently met with. A high range of hills, with a very remarkable projecting mass at a point between this village and Shaheruk lies to the south of our march. A valley called Durra-i-Khoon Khar, the produce of which is said to be considerable, is pointed out as lying beyond the point alluded to.
13	R. Bank of the Furrah Road, ...	1	3	45	Water of great purity from the river. Ground for the encampment of a large force procurable on the high bank above the river.	Forage for a large force would not be plentiful on this side the river. The low watered ground is on the left bank at this part of its course, and there it is abundant, the grass being more luxuriant than any seen since leaving Girishk, but except in times of flood cattle could ford the river with ease, and find pasture immediately on the other side. Fuel scarce.	Forded the Furrah, a river which must in times of flood be a most difficult one for an army to pass. The bed is very irregular, forming alternate rapids and deep pools, and when in flood the current is said to be extremely rapid; caravans being detained on its banks occasionally for weeks. Its breadth at this season at the point where the detachment crossed it, did not exceed 35 yards, the greatest depth being $2\frac{1}{4}$ feet; the velocity of the current $1\frac{1}{2}$ miles per hour. The bed of shingle; the water of the greatest clearness and purity.
	Carried forward, ..	237	7	186			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July. 16	Brought forward, ..	237	7	186			
	Aub-i-koormeh, ...	21	3	50	Water from a spring not very good, but wholesome. The spring amply sufficed for our small party, but of course precautions would be necessary to prevent the soft bed of the water-courses being trodden by animals, or the water wasted. Ground very irregular.	Forage for camels sufficient. The encampment placed on a small meadow of turf which if reserved for the purpose, would afford a supply of grass. No villages or cultivation near the encamping ground.	For 14 miles the road traverses a hard stony level plain. Traces of former irrigation and cultivation for six miles from the river bank, then entered low hills and traced for some miles the bed of a mountain stream full of reeds, in which at 15½ miles distance from the Furrah Road, was a pool of water. Hills round as the rest of the march road gradualy ascending.
17	Chah-i-Jehan,....	17	2	17	Water tolerably good from spring, and ample for a small force, but with a large one, or indeed in any case where water is procured from springs in soft ground. Guards are requisite to prevent animals going to drink from stirring up the mud and polluting the water, and at this place the supply with every care would not more than suffice for the wants of an army. Here (also at Aub-i-koormeh,) the supply might be increased by digging wells previously in the bed of the water-course. Ground for encampment good.	Forage both for camels and horses abundant, vegetation in the bed of water-course very luxuriant, no villages or cultivation near.	The road somewhat rough and stony. At 10½ miles from Ab-i-koormeh, there are two roads leading to the halting ground, that to the left leading up the face of a hill; a short but steep ascent was followed by the horsemen and laden yaboos, the one to the right was taken by the laden camels. Both routes were examined, that to the left is shorter and better than the other, excepting only the steep slope which would be difficult for laden camels; with a little improvement it might be rendered quite practicable for Light Artillery; the difference in distance is about a mile and a half, that entered shews the longer route, on which, though generally not so smooth as the other, there is no obstruction worth noticing.
18	Hyzabad,	20	1	135	Abundance of water from several kahreezes. Ground for encampment ample, and the plain is at this time rather marshy from water of the numerous khareezes, formerly employed in	Forage for camels and horses good and abundant. Fuel scarce. The plain on which we are encamped is amply supplied with water, and is apparently susceptible of high cultivation; villages consist-	The road, generally good and level, at part of it winds through hills of no great elevation, but which in places approach close to the road, and would from their position afford a strong post to a force
	Carried forward, ..	296	6	168			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July.	Bt. forward	296	6	168	cultivation having been suffered to run to waste.	ing of a few houses surrounded by a wall with round gardens attached are numerous, and the whole	wishing to defend the Pass against an army approaching from Herat.

plain as far as Subzwar, distant about 8 miles, has been thickly populated, and cultivated to a much greater extent than is now the case; still the province of Subzwar is reputed one of the richest, if not eminently the richest district of the present *kingdom* of Herat, and as such, is governed by a man of the first influence in the country, the eldest son of the Prime Minister. The southern route to Herat falls into that we pursued at Subzwar, and a depôt for supplies established at this place, or in its vicinity, would enable an army advancing on Herat from Kandahar to halt and recruit the cattle for a few days before encountering the toilsome marches in advance of this plain. Our halting ground was chosen at the first kahreez met with on the plain advancing from the southward; the most northerly stream we passed on the plain is $3\frac{1}{2}$ miles in advance of our present encampment. It has not been noticed in the proper place, that between Chah-i-Jehan and Hyzabad, pools of water are found in the bed of a water-course called Gundutsan at 4 miles, and again at $7\frac{1}{2}$ miles from the former place.

21	L. Bank of the Adruskund, ...	22	2	25	Water from the river of excellent quality. As already mentioned, water was found abundant at a kahreez $3\frac{1}{2}$ miles N. of our encampment at Hyzabad on the march. Water was also found at a stream 15 miles in advance of Hyzabad, sufficient for a force. A spring at the top of the Pass 18 miles on road, and water again at $18\frac{1}{2}$ miles. Sufficient ground for an encampment, but rather irregular.	Forage and fuel abundant, the bed of the river being fringed by willows and bushes, among which much dry wood may be collected. No signs of cultivation or inhabitants near the river, nor indeed are any villages seen between the valley of Subzwar and that of Herat.	A fatiguing and difficult march, no force should attempt it. From Hyderabad if it encamped there, a force might change ground to the verge of the cultivation, and irrigated land of the Subzwar plain to the northward, which would shorten the march about 4 miles. It might then halt at the stream called it is believed Khojihomeih, where there is abundance of forage, making a march of 11 miles. The water was said to be brackish, but the sepahies

and some of the officers drank of the stream, and found it not unpalatable; this arrangement would leave seven and a quarter miles to the river, on which portion of the march a difficult hill Pass has to be surmounted. After leaving the irrigated land, much of which was marshy from the overflowing of the kahreezes, came on a hard stony plain with a gentle ascent, over which we travelled for six miles, then entered hills, and continued ascending $5\frac{1}{2}$ miles by a winding road, when we

	Carried forward, ..	319	0	193	

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July.	Brought forward, ..	319	0	193	reached a table land, or rather basin, surrounded by low eminences thickly spread with reeds and bushes, and bearing the appearance of being occasionally under water. High peaks rose to the Eastward, the summits of which are judged to exceed 10,000 feet in height above the level of the sea. The table land 2½ miles across, when there is a further slight ascent, the elevation reached being considered 1500 feet above the level of Subzawar. The descent into the valley of the Adruskund is steep, rocky and tortuous, and would require the labour of a company of Pioneers for a day to make it practicable, and for three or four to make it moderately easy for heavy guns.		
22	Serai-i-Shah Bêd,	22	3	195	Water from a stream in front of the Ru-i-serai. Ground for encampment sufficient, it is rather irregular and commanded by a hill to the Eastward. Indeed all the encamping grounds among hills are commanded, on this route.	Forage for camels and horses good and abundant. No supplies of any description procurable.	For 19 miles from the Adruskund, the road is one continued ascent among hills, the elevation attained supposed to be full 1500 feet higher than the spot where we crossed the Adruskund, or 6500 feet above the sea. Forage was observed plenty throughout the march, and water was found at convenient distances the whole way. The road stoney, and in some places difficult, but quite practicable for Artillery. The Road-i-Guz, which falls into the Adruskund immediately opposite our last encampment, runs for nearly 6 miles parallel to the first part of this march.
23	The Rozeh Bagh, ...	21	0	210	Numerous artificial channels of excellent water. Abundance of room outside the garden, with access to water for a large force. Passed a spring of water 4½ miles from our last halting ground. Also a kahreez near the Hour-i-meer Daood, 6 miles from the Roza Bagh.	Jowassa for camels plentiful, grass very scarce. Bhoosa procurable from numerous villages. We are now in the valley of Herat, and not more than 7½ miles from the city.	On leaving the Serai of Shah Bêd, the road ascended for about 3 miles, attaining an elevation of about 700 feet above our last encamping ground, it then commenced a gradual but regular and continued descent to the end of the march, falling it is conjectured 2000 feet. We passed a caravanserai, called the Serai-i-Meer Daood, about 11 miles from the Serai-i-Shah Bêd, but the kahreez which formerly supplied it with water is dried up. From this point the eye ranges over great part of the valley of Herat, but the city is itself concealed by an intervening range of hills, called the Koh-i-Dooshakh; the distant mountains of the Hazaureh country are seen far overtopping a range of hills of considerable elevation on the other side of
	Carried forward, ..	362	5	158			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July.	Brought forward, ..	362	5	158	the valley. These mountains appear from this distance to be 12 or 14,000 feet high, but as the Serai-i-meer Daood is considerably elevated above the plain, this appearance may be deceptive. The road is good the whole way from the foot of the hill. The Rozeh Bagh is a royal garden planted with Scotch firs, now of great size and beauty.		
24	R. Bank of Heri Rood,	4	2	70	Water good. Ground for encampment ample, channels for irrigation leading from the river would be convenient in furnishing water for a large camp.	Forage plentiful; a meadow of considerable size on the river bank would supply grass. The quantity of jowassa would depend materially on the absence or otherwise of cultivation. At present a great deal of land has been suffered to run to waste, which has been, and probably will, again be under cultivation. This spot is but 3 miles distant from Herat, within reach of the bazars of the city.	Forded the Heri Rood, a wide shingly bed, over which the river runs in several separate channels, the largest may be 40 yards wide and 18 inches deep; current having a velocity of 1¼ mile per hour, a great portion of the water is drawn off at this season for the purpose of irrigation. In the season of flood, the river is deep and exceedingly difficult to cross, the body of water in it however appears greatly inferior to that of the Helmund; an old irregular bridge of numerous arches of unequal size formerly spanned the river. Three of the arches have altogether failed, and the whole structure is in a state of great dilapidation; the river also has partially deserted the bed in which it formerly flowed, a branch flowing round either end of the bridge.
25	Herat, the Kandahar Gate, ...	3	0	180	The city is supplied with water from the river by aqueducts, with wooden troughs running across the ditch. It is stored in large reservoirs of masonry of solid construction arched over. In time of siege an ample supply is obtainable	The valley round Herat is fertile and productive when cultivated, supplies even in ordinary years used always to be most plentiful and cheap; now the city is little better than a ruin, the country round lying waste and desolate,	From our encampment on the meadows and near the river, to the city, the road passes through a succession of villages, all or most of the houses in which are now roofless and deserted, and enclosed gardens, the walls of
	Carried forward. ..	370	0	188			

Date.	Names of Halting Places.	Distances. Mls.	Fns.	Yds.	Remarks. Water and Ground for Encampment.	Forage and Supplies.	Nature of Road, Rivers, Hills, and General Observations.
July. 25	Brought forward, ..	370	0	188	from wells dug from 12 to 14 feet below the surface.	the valley having been swept of inhabitants by the Persians, few of whom have returned. Forage for camels and horses is abundant; grain, &c. very scarce.	which have been partially thrown down, and the trees generally killed or destroyed. The road is also crossed by numerous water-courses, over some of which, nar-
	Total miles	370	0	188	row and awkward or dangerous bridges are thrown, the road has been paved is quite worn out, and is very bad, but practicable.		

(Signed.) Edward Sanders,
Captain, Engineers.

Note.—Our readers will find, that this valuable Route can be traced on the Map accompanying Lieut. Edward Conolly's paper in Vol. IX, No. 103, at p. 724 of the Journal; and we need not remark on its interest alike to the traveller, the merchant, the military, and the scientific man, whose interest or duty, or love of knowledge may lead them to study or to pursue it.—Eds.

JOURNAL

OF THE

ASIATIC SOCIETY.

Tables for determining the Elastic Force of Aqueous Vapour in the Atmosphere and the Temperature of the Dew-point, by Observations of a dry and wet bulb Thermometer; computed agreeably to Dr. Apjohn's *Hygrometric formula, under the direction of Capt.* J. T. Boileau, *of the Bengal Engineers,* F.R.S., F.R.A.S. *Superintendent of the Hon'ble E. I. Company's Magnetic Observatory at Simla.*

The formula of Dr. Apjohn, according to which the elastic force of the aqueous vapour contained in the atmosphere is deduced from the observed temperature of a dry and wet bulb Thermometer freely exposed to evaporation, was first given in the Transactions of the R. I. Academy for 1835, but as a more complete exposition of the theory by which the general expression has been obtained is given in a "Note on the value of the Numerical Co-efficient in the Hygrometric formula applied to the observations of the dry and wet bulb Thermometer," by Dr. Apjohn, published with some remarks by Professor Lloyd in the Proceedings of the R. I. Academy for 1840, it will only be necessary to notice the latter paper.

The following assumed data, form the basis of Dr. Apjohn's investigations:—

1. That the specific heat of air, and the caloric of elasticity of aqueous vapour are constant, and represented within ordinary variations of atmospheric temperature and pressure, the former by the number ·267, the latter by ·1115.

2. That where a dry and moist bulb Thermometer are exposed to the influence of the same atmosphere, when the latter has obtained a stationary temperature, the caloric which vaporizes the water is equal to that which the surrounding gas evolves in descending through that number of degrees at which the moist bulb stands below the dry, *i. e.* from the proper temperature of the air to that of the moist bulb.

3. That the air so cooled by the successive contacts with the moistened bulb is saturated with humidity.

If now a represent the specific heat of air,

e the latent heat of aqueous vapour,

t and t' the observed temperatures of a dry and wet bulb Thermometer encompassed by atmospheric air

t'' the observed temperature of the dew-point,

f and f'' the elastic forces of aqueous vapour at t and t'

p the existing pressure in inches and decimals,

30 a standard Barometer pressure in inches,

then the general expressions for the force of atmospheric vapour at the temperature of the dew-point in terms of the force of vapour at t' and of the difference of the temperatures of the wet and dry Thermometer are where t' is greater than 32° Faht.

$$f''=f'\ \frac{48\ a\ (t-t')}{e}\times\frac{p-f'}{30} \quad \ldots \quad \text{(I)}$$

and where t' is less than 32 F.

$$f''=f'-\frac{43\ a\ (t-t')}{e}\times\frac{p-f'}{30} \quad \ldots \quad \text{(II)}$$

in which by substituting for a, the value assumed above ·267 and for e its value at 50° upon the hypothesis that ·967 is the latent heat of vapour at 212° and that the sum of the sensible and latent heat is at every temperature a constant quantity.

Equation (I) becomes

$$f''=f'-\cdot01135\ (t-t')\times\frac{p-f'}{30} \quad \text{- - (III)}$$

and Equation (II) becomes

$$f''=f'-\cdot01017\ (t-t')\times\frac{p-f'}{30} \quad \text{- - (IV)}$$

In the above equations, however, the value of the co-efficient (m) depends upon the assumed values of a and e which, Dr. Apjohn remarks, are in all probability not yet known with great precision, and accordingly he proceeds to deduce values for the co-efficient (m) in the general equation directly from experiment in three separate ways as follows; viz.

1. By observations in air, in reference to which t and t' had been accurately noted, the temperature of which was afterwards raised and the observations repeated; the value of f'' is here constant for both observations.

2. By observations of t and t' in perfectly dry air where the value of f'' is of course $= o$.

3. By observations in air saturated with moisture, where f'' is obtained from a simple observation of the temperature, and in which after its temperature has been raised, the values t and t' were observed.

From the above experiments, using Anderson's Table of the elastic force of vapour, Edinburgh Encyclopedia, Art. "Hygrometer," three separate values of (m) are obtained; viz.

1st Series,	11 observations	$m = \cdot01151$
2nd Ditto,	19 ditto	$\cdot01150$
3rd Ditto,	24 ditto	$\cdot01140$
The Arithmetical mean of which is		$\frac{1}{87\cdot18}$ or $\cdot01147$

The most probable value of the final mean, as deduced by Professor Lloyd, according to the calculus of probabilities, from the means of all three values of m is $\cdot01145$, but since in the second series the result is affected by the full tabular error in the value of f, whereas in the 1st and 3rd series as m is expressed in terms of the difference of two values of f, the tabular error will not sensibly affect the result. Professor Lloyd considers that the second series should be omitted, and combining the results of the 1st and 3rd series by the same method, obtains for the value of m $\cdot01145$.

As my object in the construction of the accompanying Tables has been solely to enable observers to apply Dr. Apjohn's formula, without

being obliged to go through the labour of computing the value of f for each observation, I have, for the information of those who may not have had an opportunity of perusing his papers on the Dew-point, given in the above a brief sketch of the steps by which the Hygrometric formula has been obtained, and shall now proceed to explain the manner in which the same has been applied to the computation of the accompanying tables.

The equation which I have adopted is

$$f'' = f' - .01147\ (t - t') \times \frac{p - f'}{30}$$

in which as the co-efficient employed is the arithmetical mean of the three values of m given above, and not the most probable value, as computed by Professor Lloyd, a reason will be expected for the adoption of this number.

The Table of the elastic force of vapour which I have used for giving the values of f' that enter into the computation of the second term in the right hand member of the equation, has been computed specially for this purpose by Biot's formula, "Traite de Physique, 1816, Tome 1, p. 278."*

This Table differs so little from that employed by Dr. Apjohn, computed by Anderson from the experiments of Dalton and Ure, that as this latter has been shewn by Professor Lloyd to be more probably accurate, within the ordinary limits of observation, than either the table of Kaïntz, or that adopted by the Royal Society in the report of their Physical Committee, the employment of the Table which I have computed, will not materially affect the resulting values of the Dew-point tension or temperature.

By means of this Table, and with the three series of experiments

* This formula, which is deduced from experiments by Dalton, is as follows:—

Log Ff = Log $30 + af + bf^2 + cf^3$

The numerical values of the co-efficients are

$a =$	$-.00854121972$	Log.	$\bar{3}.9315199$
$b =$	$-.00002081091$	,,	$\bar{5}.3182910$
$c =$	$+.00000000580$	,,	$\bar{9}.7634280$

f being the number of degrees of Fahrenheit reckoned from 212° positively below, and negatively above that point.

given in Dr. Apjohn's "Note," I have computed the following values of the co-efficient m; viz.

1st Series,	11 observations,	..	$m = \cdot01155$
2nd Ditto,	19 ditto,	..	„ ·01156
3rd Ditto,	24 ditto,	..	„ ·01143

and adopting the same method as was pursued by Professor Lloyd, referred to above, the most probable value of the final mean obtained by combining all three of the values of m is .. .. ·01150

The same value by Anderson's tables, (see above,) .. ·01145

The mean of which, being the co-efficient adopted, is ·01147

Combining the means of the 1st and 3rd series, the most probable value of m is .. .. ·01120

The following table will serve to shew, that the tabular error is not nearly constant within the ordinary limits of the temperature of observation when the computed values of the tension are carried out to more than three places of decimals, and it is on this account that the value of m deduced by the second series of experiments has not been omitted, or rather that the final value of the co-efficient as obtained by a combination of all three values of m has been adopted.

Table of the Elastic Force of Aqueous Vapour, according to the experiments of Dalton, and as computed by Biot's formula.

Degrees Fahrenheit.	Tension of Vapour.		Computed value ± Experiment.
	By Dalton's Experiment.	By Biot's Formula.	
32°	0·200	0·19917	—·00083
43°25	0·297	0·29582	—·00018
54°50	0·435	0·43481	—·00019
65°75	0·630	0·63239	+·00239
77	0·910	0·91001	+·00001
88°25	1·290	1·29551	+·00551
99°5	1·820	1·82433	+·00433
110°75	2·540	2·54097	+·00097
122°	3·500	3·50003	+·00003

If the numerical values in the right hand member of the equation were computed as it is written, it is evident that the values of f''

would be obtained by the simple subtraction of two tabular numbers; but since p and f' are both variable, and the possible number of different readings of each within the limits of observation is very great, the former being recorded in inches and thousandths, the latter in degrees and tenths of Fahrenheit's scale, the adoption of such an arrangement would not only have very much enhanced the labour of computation, but would have swelled the table to a very inconvenient size. Accordingly as regards this term, the table has been separated into two parts; the first part (Table I) contains the values of $.01147\ (t-t') \times \frac{p}{30}$ which have been computed for all values of $(t-t')$ to tenths of a degree of Fahrenheit's Thermometer between 0° and 30° and for a range of pressure between 20 and 31 inches, the full numerical values being given for whole inches of pressure, and the proportional parts (which can be taken out to ·001 of an inch) in separate columns: the second part (Table II) contains the corrections necessary on account of the quantity $-f'$ omitted in the above computations, and which being comparatively small, are given only for single degrees for values of $t-t'$ between 1° and 30°, and for a range of t' between 10° and 129° the numbers in this table were computed for depressions of 1° Fahrenheit and for all the values of t' corresponding thereto, and the numbers for higher depressions being simple multiples of the value of $t-t' = 1°$ have been obtained in this manner, *i. e.* by multiplication. Table III contains the elastic force of aqueous vapour or values of f' for every degree and tenth part between $\overset{-}{03}\cdot\overset{\circ}{9}$ and $\overset{+}{145}\cdot\overset{\circ}{9}$ of Fahrenheit's Thermometer, and in this table each number has been computed directly by the formula above-mentioned.

It may at first sight appear, that the tables have been extended unnecessarily, both as regards their range and the numerical value of the entries, but the depressions at this station have compelled their extension to values of $(t-t') = 30°$ Faht. and if the computed numbers had been carried out in Table I, to less than 5 places of decimals, they would not have exhibited, with sufficient precision, the variations of the elastic force of vapour due either to the tenth part of a degree of Fahrenheit's Thermometer, or to several thousandths of an inch of pressure; this number of figures in the decimal places has therefore necessarily been retained: the range of temperature has been taken to include all possible contingencies.

A single example will suffice to render the use of the Tables familiar.

Example.—Required the elastic force of vapour in the atmosphere and the temperature of dew-point, the observed temperature of a dry bulb Thermometer being 49° 58 F. of a wet bulb Thermometer 36° 65, F. and the height of the Barometer 23·278 inches.

Here $(t-t') = 49°58-36°65 = 12°93$

Enter Table I, and under the nearest depression 12°9 take out the numbers corresponding to the height of the Barometer; viz.

for 23·000 ins.	0·11344
·200 „	99
070 „	34
008 „	4

which gives the value of $\cdot01147\ (t-t') \times \frac{p}{30}$ = for 23·278 ins. = 0·11481

Correction for f Table II, for 12°9 and 36·6 (always negative)—115

(a) .. .. $.01147\ (t-t') \times \frac{p-f'}{30} =$ .. diff.	0·11366
(b) f' from table III for 36°6	0·23444
$(a\text{-}b) = f'' = f' - \cdot01147\ (t-t') \times \frac{p-f'}{30} =$ .. .. diff.	0·12078

which gives for t'' the temperature of dew-point 18° 17, F.

By Anderson's Table, going through the computations for this example, we should have obtained $f'' =$ 0·12106

and $t'' =$ 18°20 Fahrt.

When however the wet bulb Thermometer stands below 32° Fahrt. the quantity a in the foregoing example requires to be corrected for the difference of the co-efficient above and below the freezing point; it will suffice for all practical purposes, to subtract from the number a, obtained as above, its $10\frac{1}{300}$th part, the remainder taken from the tabular value of f' will give the tension of atmospheric vapour and deduced temperature of the dew-point as before: to prevent misapprehension an example is given.

Example 2nd.—Required the tension of the atmospheric vapour and the deduced temperature of the dew-point for the following observations of a dry Thermometer 28°5 F. wet bulb do. 23°7, Fahrt. and Barometer 23·104 inches.

Here $(t-t') = 4°.8$; enter Table I, under this head, and take out numbers as follows, for

	23·000 ins.	·04221
	·100	·18
	·004	·1
01147, $(t-t') \times \frac{p}{30}$ for,	23·104	·04240
Correction for f' (Table II) for 4°.8 and 23°.7		·27
$(a) = ·01147\ (t-t') \times \frac{p-f'}{30}$		04213
$a/10$	·00421	
$a/300$	·00014	Sum 435
(a) Corrected for reading of wet bulb below 32°=diff.		·03778
f' (Table III) for 23°.7		·14779
$f'' =$		·11001
$t'' =$		15°.7

The computed value of f'' using the co-efficient for values of t' below 32° F. would have been ·11003, and the difference in the temperature of the dew-point from the approximate value obtained above, is not equal to the 200th of a degree of Fahrenheit.

J. T. Boileau.

Table I,—*Apjohn's Hygrometric Tables.*

Barom. Inches.	Decls. Inches.	(t.—t.′)=00°. (t—t′) p. 87.18 / 30	Parts for Decls. Inches.	(t—t′) p. 87.18 / 30	Parts for Decls. Inches.	(t—t′)=01°. (t—t′) p. 87.18 / 30	Parts for Decls. Inches.	(t—t′) p. 87.18 / 30	Parts for Decls. Inches.	Decls. Inches.	Barom. Inches.
		00		0.°5		1.°0		1.°5			
20				.00382		.00765		.01147			20
21	.1			.00401	2	.00803	4.	.01204	6.	1	21
22	.2			.00420	4	.00841	8.	.01262	11.	.2	22
23	.3			.00440	6	.00879	11.	.01319	17.	.3	23
24	.4			.00459	8	.00918	15.	.01376	23.	.4	24
25	.5			.00479	10	.00956	19.	.01434	29.	.5	25
26	.6			.00497	11	.00994	23.	.01491	34.	.6	26
27	.7			.00516	13	.01032	27.	.01548	40.	.7	27
28	.8			.00535	15	.01071	31.	.01606	46.	.8	28
29	.9			.00554	17	.01109	34.	.01663	52.	.9	29
30				.00574		.01147		.01721			30
31				.00593		.01185		.01778			31
		0.°1		0.°6		1.°1		1.°6			
20		.00076		.00459		.00841		01223			20
21	.1	00080	0	00482	2	.00883	4	01285	6	1	21
22	.2	00084	1	00505	5	.00925	8	01346	12	2	22
23	.3	00088	1	00528	7	.00967	13	01407	18	3	23
24	.4	00092	2	00551	9	.01009	17	01468	24	4	24
25	.5	00096	2	00573	11	.01051	21	01529	31	5	25
26	.6	00099	2	00596	14	.01093	26	01591	37	6	26
27	.7	00103	3	00619	16	.01136	29	01652	43	7	27
28	.8	00107	3	00642	18	.01178	34	01713	49	8	28
29	.9	00111	3	00665	21	.01220	38	01774	55	9	29
30		00115		00688		.01262		01835			30
31		.00118		00711		.01304		01896			31
		0.°2		0.°7		1.°2		1.°7			
20		.00153		.00535		00918		01300			20
21	1	00161	1	00562	3	00963	5	01365	7	1	21
22	2	00168	2	00589	5	01009	9	01430	13	2	22
23	3	00176	2	00616	8	01055	14	01495	20	3	23
24	4	00183	3	00642	11	01101	19	01560	26	4	24
25	5	00191	4	00669	13	01147	23	01625	33	5	25
26	6	00199	5	00696	16	01193	28	01690	39	6	26
27	7	00206	5	00723	19	01239	33	01753	46	7	27
28	8	00214	6	00749	21	.01285	37	01820	52	8	28
29	9	00222	7	00776	24	01331	42	01885	59	9	29
30		00229		00803		01376		01950			30
31		00237		00830		01422		02015			31
		0.°3		0.°8		1.°3		1.°8			
20		00229		.00612		00994		01376			20
21	1	00241	1	00642	3	01044	5	01445	7	1	21
22	2	00252	2	00673	6	01093	10	01514	14	2	22
23	3	00264	3	00703	9	01143	15	01583	21	3	23
24	4	00275	5	00734	12	01193	20	01652	28	4	24
25	5	00287	6	00765	15	01243	25	01721	34	5	25
26	6	00298	7	00795	18	01292	30	01789	41	6	26
27	7	00310	8	00826	21	01342	35	01858	48	7	27
28	8	00321	9	00856	24	01392	40	01927	55	8	28
29	9	00333	10	00887	28	01441	45	01996	62	9	29
30		00344		00918		01491		02065			30
31		00356		00948		01541		02133			31
		0.°4		0.°9		1.°4		1.°9			
20		00306		.00688		01071		01453			20
21	1	00321	2	00723	3	01124	5	01526	7	1	21
22	2	00336	3	00757	7	01178	11	01598	15	2	22
23	3	00352	5	00791	10	01231	16	01671	22	3	23
24	4	00367	6	00826	14	01285	21	01743	29	4	24
25	5	00382	8	00860	17	01338	27	01816	36	5	25
26	6	00398	9	00895	21	01392	32	01889	44	6	26
27	7	00413	11	00929	24	01445	37	01961	51	7	27
28	8	00428	12	00963	28	01499	43	02034	58	8	28
29	9	00443	14	00998	31	01552	48	02107	65	9	29
30		00459		01032		01606		02179			30
31		00474		01067		01659		02252			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom.		(t.—t.′)=02°.				(t.—t.(=03°.				Barom.	
Inches.	Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	Decls. Inches.	Inches.
		2.°0		2.°5		3.°0		3.°5			
20		.01529		.01912		.02294		.02676			20
21	1	.01606	7	.02007	10	.02409	11	.02810	13	.1	21
22	2	.01682	15	.02103	19	.02523	23	.02944	27	.2	22
23	3	.01759	22	.02199	29	.02638	34	.03078	40	.3	23
24	4	.01835	30	.02294	38	.02753	46	.03212	54	.4	24
25	5	.01912	37	.02390	48	.02868	57	.03346	67	.5	25
26	6	.01988	45	.02485	57	.02982	69	.03479	80	.6	26
27	7	.02065	52	.02581	67	.03097	80	.03613	94	.7	27
28	8	.02141	60	.02676	76	.03212	92	.03747	107	.8	28
29	9	.02218	67	.02772	86	.03326	103	.03881	120	.9	29
30		.02294		.02868		.03441		.04015			30
31		.02371		.02963		.03556		.04148			31
		2.°1		2.°6		3.°1		3.°6			
20		.01606		.01988		.02370		.02753			20
21	1	.01686	8	.02088	10	.02489	12	.02891	14	1	21
22	2	.01766	16	.02187	20	.02608	24	.03028	28	2	22
23	3	.01847	24	.02286	30	.02726	36	.03166	41	3	23
24	4	.01927	32	.02386	40	.02845	47	.03303	55	4	24
25	5	.02007	40	.02485	50	.02963	59	.03441	69	5	25
26	6	.02088	48	.02585	60	.03082	71	.03579	83	6	26
27	7	.02168	56	.02684	70	.03200	83	.03716	96	7	27
28	8	.02248	64	.02783	80	.03319	95	.03854	110	8	28
29	9	.02328	72	.02883	89	.03437	107	.03992	124	9	29
30		.02409		.02982		.03556		.04120			30
31		.02489		.03082		.03674		.04268			31
		2.°2		2.°7		3.°2		3.°7			
20		.01682		.02065		.02247		.02791			20
21	1	.01766	8	.02168	10	.02569	12	.02931	14	1	21
22	2	.01851	17	.02271	21	.02692	24	.03070	28	2	22
23	3	.01935	25	.02374	31	.02814	37	.03210	42	3	23
24	4	.02019	34	.02478	41	.02936	49	.03349	56	4	24
25	5	.02103	42	.02581	52	.03059	61	.03489	70	5	25
26	6	.02187	50	.02684	62	.03181	73	.03628	84	6	26
27	7	.02271	59	.02787	72	.03303	86	.03768	98	7	27
28	8	.02355	67	.02891	83	.03426	98	.03908	102	8	28
29	9	.02439	76	.02994	93	.03548	110	.04047	126	9	29
30		.02523		.03097		.03671		.04187			30
31		.02608		.03200		.03793		.04326			31
		2.°3		2.°8		3.°3		3.°8			
20		.01759		.02141		.02523		.02906			20
21	1	.01847	9	.02248	11	.02650	13	.03051	15	1	21
22	2	.01935	18	.02355	21	.02776	25	.03196	29	2	22
23	3	.02023	26	.02462	32	.02902	38	.03342	44	3	23
24	4	.02110	35	.02569	43	.03028	50	.03487	58	4	24
25	5	.02198	44	.02676	54	.03154	63	.03632	73	5	25
26	6	.02286	53	.02783	64	.03281	76	.03778	87	6	26
27	7	.02374	62	.02891	75	.03407	88	.03923	102	7	27
28	8	.02462	70	.02998	86	.03533	101	.04068	116	8	28
39	9	.02550	79	.03105	96	.03659	113	.04213	131	9	29
30		.02638		.03212		.03785		.04359			30
31		.02726		.03319		.03911		.04504			31
		2.°4		2.°9		3.°4		3.°9			
20		.01835		.02218		.02600		.02982			20
21	1	.01927	9	.02328	11	.02730	13	.03131	15	1	21
22	2	.02019	18	.02439	22	.02850	26	.03281	30	2	22
23	3	.02111	28	.02550	33	.02980	39	.03430	45	3	23
24	4	.02202	37	.02651	44	.03120	52	.03579	60	4	24
25	5	.02294	46	.02772	55	.03250	65	.03728	75	5	25
26	6	.02386	55	.02883	67	.03380	78	.03877	89	6	26
27	7	.02478	64	.02994	78	.03510	91	.04026	104	7	27
28	8	.02569	73	.03105	89	.03640	104	.04175	119	8	28
29	9	.02661	83	.03216	100	.03770	117	.04324	134	9	29
30		.02753		.03325		.03900		.04473			30
31		.02847		.03437		.04030		.04623			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom.		(t.—t.′)=04°.			(t.—t.′)=05°.			Barom.	
Inches.	Decls. Inches.	$\frac{(t-t')\,p.}{87.18 \times 30}$	Parts for Decls. Inches.	$\frac{(t-t')\,p.}{87.18 \times 30}$	Parts for Decls. Inches.	$\frac{(t-t')\,p.}{87.18 \times 30}$	Parts for Decls. Inches.	Decls. Inches.	Inches.
		4.°0		4.°5		5.°0		5.°5			
20		03059		03441		03823		04206			20
21	1	03212	15	03613	17	04015	19	04416	21	1	21
22	2	03365	31	02785	34	04206	38	04626	42	2	22
23	3	03518	46	03957	52	04397	57	04837	63	3	23
24	4	03671	61	04129	69	04588	76	05047	84	4	24
25	5	03823	76	04301	86	04779	96	05257	105	5	25
26	6	03976	92	04473	103	04970	115	05468	126	6	26
27	7	04129	107	04646	120	05162	134	05678	147	7	27
28	8	04282	122	04818	138	05353	153	05888	168	8	28
29	9	04435	138	04990	155	05544	172	06098	189	9	29
30		04588		05162		05735		06309			30
31		04741		05334		05926		06519			31
		4.°1		4.°6		5.°1		5.°6			
20		03135		03518		03900		04282			20
21	1	03292	16	03693	18	04095	20	04496	21	1	21
22	2	03449	31	03869	35	04290	39	04711	43	2	22
23	3	03606	47	04045	53	04485	59	04925	64	3	23
24	4	03762	63	04221	70	04680	78	05139	86	4	24
25	5	03919	78	04397	88	04875	99	05353	107	5	25
26	6	04076	94	04573	106	05070	117	05367	128	6	26
27	7	04233	110	04749	123	05265	137	05781	150	7	27
28	8	04389	125	04925	141	05460	156	05995	171	8	28
29	9	04546	141	05101	158	05655	176	06209	193	9	29
30		04703		05276		05850		06423			30
31		04860		05452		05945		06638			31
		4.°2		4.°7		5.°2		5,°7			
20		03212		03556		03976		04359			20
21	1	03372	16	03734	18	04175	20	04577	22	1	21
22	2	03533	32	03911	36	04374	40	04795	44	2	22
23	3	03693	48	04089	53	04573	60	05013	65	3	23
24	4	03854	64	04267	71	04772	80	05230	87	4	24
25	5	04015	80	04445	89	04971	99	05448	109	5	25
26	6	04175	96	04623	107	05169	119	05666	131	6	26
27	7	04336	112	04800	125	05368	139	05884	153	7	27
28	8	04496	128	04978	142	05567	159	06102	174	8	28
29	9	04657	145	05156	161	05766	179	06320	196	9	29
30		04818		05334		05965		06538			30
31		04978		05512		06163		06756			31
		4.°3		4.°8		5.°3		5.°8			
20		03288		03671		04053		04435			20
21	1	03453	16	03854	18	04256	20	04657	22	1	21
22	2	03617	33	04038	37	04458	41	04879	44	2	22
23	3	03781	49	04221	55	04661	61	05101	67	3	23
24	4	03946	66	04405	73	04863	81	05322	89	4	24
25	5	04110	82	04588	92	05066	101	05544	111	5	25
26	6	04275	99	04772	110	05269	122	05766	133	6	26
27	7	04439	115	04955	128	05471	142	05988	155	7	27
28	8	04603	132	05139	147	05674	162	06209	177	8	28
29	9	04768	148	05322	165	05877	182	06431	200	9	29
30		04932		05506		06079		06653			30
31		05097		05689		06282		06875			31
		4.°4		4.°9		5.°4		5.°9			
20		03365		03747		04129		04512			20
21	1	03533	17	03934	19	04336	21	04737	23	1	21
22	2	03701	34	04122	37	04542	41	04963	45	2	22
23	3	03869	50	04309	56	04749	62	05188	68	3	23
24	4	04038	67	04496	75	04955	83	05414	90	4	24
25	5	04206	84	04684	94	05162	103	05640	113	5	25
26	6	04374	101	04871	112	05368	124	05865	135	6	26
27	7	04542	118	05058	131	05575	145	06091	158	7	27
28	8	04711	135	05246	150	05781	165	06316	180	8	28
29	9	04879	151	05433	169	05988	186	06542	203	9	29
30		05047		05620		06194		06768			30
31		05215		05808		06400		06993			31

TABLE I,—*Apjohn's Hygrometic Tables.—(Continued.)*

Barom.		(t.—t.′)=06°.				(t—t′)=07°.				Barom.
Inches.	Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	Decls. Inches.	Inches.
		6.°0		6.°5		7.°0		7.°5			
20		.04588		04971		05353		05735			20
21	1	.04818	23	05219	25	05620	27	06022	29	1	21
22	2	.05047	46	05468	50	05888	54	06309	57	2	22
23	3	.05276	69	05716	75	06156	80	06595	86	3	23
24	4	.05506	921	05965	99	06423	107	06882	115	4	24
25	5	.05735	115	06213	124	06691	134	07169	143	5	25
26	6	.05965	138	06462	149	06959	161	07456	172	6	26
27	7	.06194	161	06710	174	07226	187	07743	201	7	27
28	8	.06423	184	06959	199	07494	214	08029	229	8	28
29	9	.06653	206	07207	224	07762	241	08316	258	9	29
30		.06882		07456		08029		08603			30
31		.07112		07704		08297		08890			31
		6.°1		6.°6		7.°1		7.°6			
20		.04665		05047		05429		05812			20
21	1	.04898	23	05299	25	05701	27	06102	29	1	21
22	2	.05131	47	05552	50	05972	54	06393	58	2	22
23	3	.05364	70	05804	76	06244	81	06683	81	3	23
24	4	.05598	93	06056	101	06515	109	06974	116	4	24
25	5	.05831	117	06309	126	06787	136	07265	145	5	25
26	6	.06064	140	06561	151	07058	163	07555	174	6	26
27	7	.06297	163	06813	177	07330	190	07846	203	7	27
28	8	.06530	187	07066	202	07601	217	08136	232	8	28
29	9	.06764	210	07318	227	07873	244	08427	262	9	29
30		.06997		07570		08144		08718			30
31		.07230		07823		08415		09008			31
		6.°2		6.°7		7.°2		7.°7			
20		.04741		05213		05506		05888			20
21	1	.04978	24	05380	26	05781	28	06183	29	1	21
22	2	.05215	47	05636	51	06056	55	06477	59	2	22
23	3	.05452	71	05892	77	06332	83	06771	88	3	23
24	4	.05689	95	06148	102	06607	110	07066	118	4	24
25	5	.05926	119	06404	128	06882	138	07360	147	5	25
26	6	.06163	142	06660	154	07158	165	07655	177	6	26
27	7	.06400	166	06917	179	07433	193	07949	206	7	27
28	8	.06638	190	07173	205	07708	220	08243	235	8	28
29	9	.06875	213	07429	231	07903	248	08638	265	9	29
30		.07112		07685		08259		08832			30
31		.07349		07941		08534		09127			31
		6.°3		6.°8		7.°3		7.°8			
20		.04818		05200		05582		05965			20
21	1	.05058	24	05460	26	05861	28	06263	30	1	21
22	2	.05299	48	05720	52	06140	56	06561	60	2	22
23	3	.05840	72	05980	78	06420	84	06859	89	3	23
24	4	.05781	96	06240	104	06699	112	07158	119	4	24
25	5	.06022	120	06500	130	06978	140	07456	149	5	25
26	6	.06263	145	06760	156	07257	167	07754	179	6	26
27	7	.06504	169	07020	182	07536	195	08052	209	7	27
28	8	.06745	193	07280	208	07815	223	08350	239	8	28
29	9	.06985	217	07540	234	08094	251	08649	268	9	29
30		.07226		07800		08373		08947			30
31		.07467		08060		08653		09245			31
		6.°4		6.°9		7.°4		7.°9			
20		.04894		05276		05659		06041			20
21	1	.05139	24	05540	26	05942	28	06343	30	1	21
22	2	.05383	49	05804	53	06225	57	06645	60	2	22
23	3	.05628	73	06068	79	06508	85	06947	91	3	23
24	4	.05873	98	06332	106	06790	113	07249	121	4	24
25	5	.06118	122	06595	132	07073	141	07551	151	5	25
26	6	.06362	147	06859	158	07356	170	07853	181	6	26
27	7	.06607	171	07123	185	07639	198	08155	211	7	27
28	8	.06852	196	07387	211	07922	226	08458	242	8	28
29	9	.07096	220	07651	137	08205	255	08760	272	9	29
30		.07341		07915		08488		09062			30
31		.07586		08178		08771		09364			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom.		(t.—t.′)=08°.			(t.—t.′)=09°.			Barom.	
Inches.	Decl. Inches.	(t—t′) p. 87.18 / 30	Parts for Decl. Inches.	(t—t′) p. 87.18 / 30	Parts for Decl. Inches.	(t—t′) p. 87.18 / 30	Parts for Decl. Inches.	(t—t′) p. 87.18 / 30	Parts for Decl. Inches.	Decl. Inches.	Inches.
		8.°0		8.°5		9.°0		9.°5			
20		06118		06500		06882		07265			20
21	.1	06423	31	06825	33	07226	34	07625	36	1	21
22	.2	06729	61	07150	65	07670	69	07991	73	2	22
23	.3	07035	92	07475	98	07915	103	08354	109	3	23
24	.4	07341	122	07800	130	08259	138	08718	145	4	24
25	.5	07647	153	08125	163	08603	172	09081	182	5	25
26	.6	07953	184	08450	195	08947	206	09444	218	6	26
27	.7	08259	214	08775	228	09291	241	09807	254	7	27
28	.8	08565	245	09100	260	09635	275	10170	291	8	28
29	.9	08870	275	09425	293	09979	310	10534	327	9	29
30		09176		09750		10223		10897			30
31		09482		10075		10667		11260			31
		8.°1		8.°6		9.°1		9.°6			
20		06194		06576		06959		07341			20
21	1	06504	31	06905	33	07307	35	07708	37	1	21
22	2	06813	62	07234	66	07655	70	08075	73	2	22
23	3	07123	93	07563	99	08003	104	08442	110	3	23
24	4	07433	124	07892	132	08350	139	08809	147	4	24
25	5	07743	155	08220	164	08608	174	09176	184	5	25
26	6	08052	186	08549	197	09046	209	09543	220	6	26
27	7	08362	217	08878	230	09394	244	09910	257	7	27
28	8	08672	248	09207	253	09742	278	10278	294	8	28
29	9	08981	279	09536	296	10090	313	10645	330	9	29
30		09291		09865		10438		11012			30
31		09591		10193		10786		11379			31
		8.°2		8.°7		9.°2		9.°7			
20		06270		06653		07035		07418			20
21	1	06584	31	06985	33	07387	35	07788	37	1	21
22	2	06898	63	07318	67	07759	70	08159	74	2	22
23	3	07211	94	07651	99	08090	106	08530	111	3	23
24	4	07525	125	07983	133	08442	141	08901	148	4	24
25	5	07838	157	08316	166	08794	176	09272	185	5	25
26	6	08152	188	08649	200	09146	211	09643	223	6	26
27	7	08465	219	08981	233	09498	246	10014	260	7	27
28	8	08779	251	09314	266	09849	281	10385	297	8	28
29	9	09092	282	09647	299	10291	317	10755	334	9	29
30		09406		09979		10553	352	11126			30
31		09719		10312		10995		11497			31
		8.°3		8.°8		9.°3		9 °8			
20		06347		06729		07112		07494			20
21	1	06664	32	07066	34	07467	36	07819	37	1	21
22	2	06982	63	07402	67	07823	71	08243	75	2	22
23	3	07299	95	07739	101	08178	107	08618	112	3	23
24	4	07616	127	08075	135	08534	142	08993	150	4	24
25	5	07934	159	08412	168	08890	178	09368	187	5	25
26	6	08251	190	08748	202	09249	213	09742	225	6	26
27	7	08568	222	09085	236	09691	249	10117	262	7	27
28	8	08886	254	09421	269	09956	284	10492	300	8	28
29	9	09203	286	09758	303	10312	320	10866	337	9	29
30		09520		10094		10668		11241			30
31		09838		10430		11023		11616			31
		8.°4		8.°9		9.°4		9.°9			
20		06423		06806		07188		07570			20
21	1	06745	32	07146	34	07548	36	07949	38	1	21
22	2	07066	64	07486	68	07907	72	08328	76	2	22
23	3	07387	96	07827	102	08266	108	08706	114	3	23
24	4	07708	128	08167	136	08626	144	09085	151	4	24
25	5	08029	161	08507	170	08985	180	09463	189	5	25
26	6	08350	193	08848	204	09345	216	09842	227	6	26
27	7	08672	225	09188	238	09704	252	10220	265	7	27
28	8	08993	257	09528	272	10063	288	10599	303	8	28
29	9	09314	289	09968	306	10423	323	10977	341	9	29
30		09635		10209		10782		11356			30
31		09956		10549		11142		11734			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom.		(t.—t.′)=10°.				(t.—t.′)=11°.				Barom.
Inches.	Decl. Inches.	(t—t′)p. / 87.18 × 30	Parts for Decl. Inches.	(t—t′)p. / 87.18 × 30	Part for Decl. Inches.	(t—t′)p. / 87.18 × 30	Parts for Decl. Inches.	(t—t′)p. / 87.18 × 30	Parts for Decl. Inches.	Decl. Inches.	Inches.
		10.°0		10.°5		11.°0		11.°5			
20		.07647		.08029		.08412		.08794			20
21	.1	.08029	38	.08431	40	.08832	42	.09234	44	.1	21
22	.2	.08412	76	.08832	80	.09253	84	.09673	88	.2	22
23	.3	.08794	115	.09234	120	.09673	126	.10113	132	.3	23
24	.4	.09176	153	.09635	161	.10094	168	.10553	176	.4	24
25	.5	.09559	191	.10037	201	.10515	210	.10993	220	.5	25
26	.6	.09941	229	.10438	241	.10935	252	.11432	264	.6	26
27	.7	.10323	268	.10840	281	.11356	294	.11872	308	.7	27
28	.8	.10706	306	.11241	321	.11776	336	.12312	352	.8	28
29	.9	.11088	344	.11643	361	.12097	379	.12751	396	.9	29
30		.11470		.12044		.12618		.13191			30
31		.11853		.12445		.13038		.13631			31
		10.°1		10.°6		11.°1		11.°6			
20		.07723		.08106		.08488		.08870			20
21	.1	.08110	39	.08511	41	.08913	42	.09314	44	.1	21
22	.2	.08496	77	.08916	81	.09337	85	.09758	89	.2	22
23	.3	.08882	116	.09322	122	.09761	127	.10201	133	.3	23
24	.4	.09268	154	.09727	162	.10186	170	.10645	177	.4	24
25	.5	.09654	193	.10132	203	.10610	212	.11088	222	.5	25
26	.6	.10040	232	.10538	243	.11035	255	.11532	266	.6	26
27	.7	.10427	270	.10943	284	.11459	297	.11975	310	.7	27
28	.8	.10813	309	.11348	324	.11883	240	.12419	355	.8	28
29	.9	.11199	348	.11753	365	.12308	382	.12862	399	.9	29
30		.11585		.12159		.12732		.13306			30
31		.11979		.12564		.13157		.13750			31
		10.°2		10.°7		11.°2		11.°7			
20		.07800		.08182		.08565		.08947			20
21	.1	.08190	39	.08591	41	.08993	43	.09394	45	.1	21
22	.2	.08580	78	.09000	82	.09421	86	.09842	89	.2	22
23	.3	.08970	117	.09410	123	.09849	128	.10289	134	.3	23
24	.4	.09360	156	.09819	164	.10278	171	.10736	179	.4	24
25	.5	.09750	195	.10228	205	.10706	214	.11184	224	.5	25
26	.6	.10140	234	.10637	245	.11134	257	.11631	268	.6	26
27	.7	.10530	273	.11046	286	.11562	300	.12078	313	.7	27
28	.8	.10920	312	.11455	327	.11990	343	.12526	358	.8	28
29	.9	.11310	351	.11864	368	.12419	385	.12973	403	.9	29
30		.11700		.12273		.12847		.13420			30
31		.12090		.12683		.13275		.13868			31
		10.°3		10.°8		11.°3		11.°8			
20		.07876		.08259		.0864I		.09023			20
21	.1	.08270	29	.08672	41	.09073	43	.09475	45	.1	21
22	.2	.08664	79	.09685	83	.09505	86	.09926	90	.2	22
23	.3	.09058	118	.09494	124	.09937	130	.10337	135	.3	23
24	.4	.09452	158	.09910	165	.10369	173	.10828	180	.4	24
25	.5	.09845	197	.10323	206	.10801	216	.11279	226	.5	25
26	.6	.10239	236	.10736	248	.11233	259	.11730	271	.6	26
27	.7	.10633	276	.11493	289	.11665	302	.12182	316	.7	27
28	.8	.11027	315	.11562	330	.12098	346	.12633	361	.8	28
29	.9	.11421	354	.11975	372	.12530	389	.13084	406	.9	29
30		.11815		.12388		.12962		.13535			30
31		.12208		.12801		.13394		.13986			31
		10.°4		10.°9		11.°4		11.°9			
20		.07953		.08335		.08718		.09100			20
21	.1	.08350	40	.08752	42	.09153	44	.09555	46	.1	21
26	.2	·08748	80	,09169	83	.09589	87	.10010	91	.2	22
23	.3	.09146	119	.09585	125	.10025	131	.10465	137	.3	23
24	.4	.09543	159	.10002	167	.10461	174	.10920	182	.4	24
25	.5	.09941	199	.10409	208	.10897	218	.11375	228	.5	25
26	.6	.10339	239	.10836	250	.11333	262	.11830	273	.6	26
27	.7	.10736	278	.11253	292	.11769	305	.12285	319	.7	27
28	.8	.11134	318	.11669	333	.12205	349	12740	364	.8	28
29	.9	·11532	358	.12086	375	.12640	392	.13195	410	.9	29
30		.11929		.12503		.13076		.13650			30
31		.12327		.12920		.13512		.14105			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom.		(t—t′)=12°.				(t—t′)=13°.				Barom.	
Inches.	Decl. Inches.	(t—t′) p. 87.18 30	Parts for Decl. Inches.	(t—t′) p. 87.18 30	Parts for Decl. Inches.	(t—t′) p. 87·18 30	Parts for Decl. Inches.	(t—t′) p. 87.18 30	Parts for Decl. Inches.	Decl. Inches.	Inches.
		12.°0		12.°5		13.°0		13.°5			
20		09176		.09559		.09941		.10323			20
21	.1	09635	46	.10037	48	.10438	50	.10840	52	.1	21
22	.2	10094	92	.10515	95	.10935	99	.11356	103	.2	22
23	.3	10553	138	.10993	143	.11432	149	.11872	155	.3	23
24	.4	11012	184	.11470	191	.11928	199	.12388	206	.4	24
25	.5	11470	229	.11948	239	.12426	249	.12904	258	.5	25
26	.6	11927	275	.12426	287	.12923	298	.13420	310	.6	26
27	.7	12388	321	.12904	335	.13420	348	.13937	361	.7	27
28	.8	12847	367	.13382	382	.13818	398	.14453	413	.8	28
29	.9	13306	414	.13860	430	.14415	447	.14969	463	.9	29
30		13765		.14338		.14912		.15485			30
31		14223		.14816		.15409		.16001			31
		12.°1		12.°6		13.°1		13.°6			
20		09253		.09635		.100186		.10400			20
21	.1	09715	46	.10117	48	.105181	50	.10920	52	.1	21
22	.2	10178	93	.10599	96	.11019	100	.11440	104	.2	22
23	.3	10641	139	.11080	145	.11520	150	.11960	156	.3	23
24	.4	11103	185	.11562	193	.12021	200	.12480	208	.4	24
25	.5	11566	231	.12044	241	.12522	250	.13000	260	.5	25
26	.6	12029	278	.12526	289	.13023	301	.13520	312	.6	26
27	.7	12492	324	.13008	337	.13524	351	.14040	364	.7	27
28	.8	12954	370	.13489	385	.14025	401	.14560	416	.8	28
29	.9	13417	416	.13971	434	.14525	451	.15080	468	.9	29
30		13879		.14453		.15026		.15600			30
31		14342		.14935		.15527		.16120			31
		12.°2		12.°7		13.°2		13.°7			
20		09329		.09712		.10094		.10476			20
21	.1	09796	47	.10197	49	.10599	50	.11000	52	.1	21
22	.2	10252	93	.10683	97	.11103	101	.11524	105	.2	22
23	.3	10719	140	.11168	146	.11608	151	.12048	157	.3	23
24	.4	11185	187	.11654	194	.12113	202	.12572	210	.4	24
25	.5	11652	233	.12140	243	.12618	252	.13095	262	.5	25
26	.6	12128	280	.12625	291	.13122	303	.13619	314	.6	26
27	.7	12595	325	.13111	340	.13627	353	.14143	367	.7	27
28	.8	13061	373	.13596	388	.14132	404	.14667	419	.8	28
29	.9	13528	420	.14082	437	.14636	454	.15191	471	.9	29
30		13994		.14568		.15141		.15715			33
31		14460		.15053		.15646		.16238			31
		12.°3		12.°8		13.°3		13.°8			
20		09406		.09788		.10170		.10553			20
21	.1	09876	47	.10278	49	.10679	51	.11080	53	.1	21
22	.2	10346	94	.10767	98	.11188	102	.11608	106	.2	22
23	.3	10817	141	.11256	147	.11696	153	.12136	158	.3	23
24	.4	11287	188	.11746	196	.12205	203	.12663	211	.4	24
25	.5	11757	235	.12235	245	.12713	254	.13191	264	.5	25
26	.6	12228	282	.12725	294	.13222	305	.13719	317	.6	26
27	.7	12698	329	.13214	343	.13730	356	.14246	369	.7	27
28	.8	13168	376	.13703	392	.14239	407	.14774	422	.8	28
29	.9	13638	423	.14193	440	.14747	458	.15302	475	.9	29
30		14109		.14682		.15256		.15839			30
31		14579		.15172		.15764		.16357			31
		12.°4		12.°9		13.°4		13.°9			
20		09482		.09865		.10247		.10629			20
21	.1	09564	47.	.10358	49	.10759	51	.11161	53	·1	21
22	.2	10430	95.	.10851	99	.11272	102	.11692	106	.2	22
23	.3	10905	142.	.11344	148	.11784	154	.12224	159	.3	23
24	.4	11379	190.	.11838	197	.12296	205	.12755	213	.4	24
25	.5	11853	237.	.12331	247	.12809	256	.13287	266	.5	25
26	.6	12327	284.	.12824	296	.13321	307	.13818	319	.6	26
27	.7	12801	332.	.13317	345	.13833	359	.14350	372	.7	27
28	.8	13275	379.	.13810	395	.14346	410	.14881	425	.8	28
29	.9	13749	427.	.14304	444	.14858	461	.15412	478	.9	29
30		14223		.14797		.15370		.15944			30
31		14698		·15290		.15883		.16475			31

TABLE I.—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom. Inches.	Decl. Inches.	(t—t′)=14.°0 (t—t′) p. 87.18 30	Parts for Decl. Inches.	(t—t′)=14.°5 (t—t′) p. 87.18 30	Parts for Decl. Inches.	(t—t′)=15.°0 (t—t′) p. 87.18 30	Parts for Decl. Inches.	(t—t′)=15.°5 (t—t′) p. 87.18 30	Parts for Decl. Inches.	Barom. Decl. Inches.	Inches.
		14.°0		14.°5		15.°0		15.°5			
20		.10706		.11088		.11470		.11853			20
21	.1	.11241	54	.11643	55	.12044	57	.12445	59	.1	21
22	.2	.11776	107	.12197	111	.22618	115	.13038	119	.2	22
23	.3	.12312	161	.12751	166	.13191	172	.13631	178	.3	23
24	.4	.12847	214	.13306	222	.13765	229	.14223	237	.4	24
25	.5	.13382	268	.13860	277	.14338	287	.14816	296	.5	25
26	.6	.13918	321	.14415	333	.14912	344	.15409	256	.6	26
27	.7	.14453	375	.14969	388	.15485	401	.16001	415	.7	27
28	.8	.14988	428	.15523	444	.16059	459	.16594	474	.8	28
29	.9	.15523	482	.16078	499	.16632	516	.17187	533	.9	29
30		.16059		.16632		.17206		.17779			30
31		.16594		.17169		.17789		.18372			31
		14.°1		14.°6		15.°1		15.°6			
20		.10783		.11165		.11547		11929			20
21	.1	.11322	54	.11723	56	.12124	58	12526	60	.1	21
22	.2	.11861	108	.12281	112	.12702	115	.13122	119	.2	22
23	.3	.12400	162	.12839	167	.13279	173	.13719	179	.3	23
24	.4	.12939	216	.13398	223	.13856	231	.14315	239	.4	24
25	.5	.13479	270	.13956	279	.14434	289	.14912	298	.5	25
26	.6	.14018	323	.14514	335	.15011	346	.15508	358	.6	26
27	.7	.14557	377	.15072	391	.15588	404	.16105	418	.7	27
28	.8	.15096	431	.15630	447	.16166	462	.16701	477	.8	28
29	.9	.15635	485	.16189	502	.16743	520	.17297	537	.9	29
30		.16174		.16747		.17320		.17894			30
31		.16713		.17305		.17898		.18490			31
		14.°2		14.°7		15.°2		15.°7			
20		.10859		.11241		.11623		.12006			20
21	.1	.11402	54	.11803	56	.12205	58	.12606	60	.1	21
22	.2	.11945	109	.12365	112	.12786	116	.13206	120	.2	22
23	.3	.12488	163	.12927	169	.13367	174	.13807	180	.3	23
24	.4	.13030	217	.13489	225	.13948	232	.14407	240	.4	24
25	.5	.13573	271	.14051	281	.14529	291	.15007	300	.5	25
26	.6	.14116	326	.14613	337	.15110	349	.15607	360	.6	26
27	.7	.14659	380	.15175	393	.15692	407	.16208	420	.7	27
28	.8	.15202	434	.15737	450	.16273	465	.16808	480	.8	28
29	.9	.15745	489	.16300	506	.16854	523	.17408	540	.9	29
30		.16288		.16862		.17435		.18009			30
31		.16831		.17424		.18016		.18609			31
		14.°3		14.°8		15.°3		15.°8			
20		.10935		.11318		.11700		.12082			20
21	.1	.11482	55	.11883	57	.12285	59	.12686	60	.1	21
22	.2	.12029	109	.12449	113	.12870	117	.13290	121	.2	22
23	.3	.12575	164	.13015	170	.13455	176	.13895	181	.3	23
24	.4	.13122	219	.13581	226	.14040	234	.14499	242	.4	24
25	.5	.13669	273	.14147	283	.14625	293	.15103	302	.5	25
26	.6	.14216	328	.14713	340	.15210	351	.15707	362	.6	26
27	.7	.14763	383	.15279	396	.15795	410	.16311	423	.7	27
28	.8	.15309	437	.15845	453	.16380	468	.16915	483	.8	28
29	.9	.15856	492	.16410	509	.16965	527	.17519	544	.9	29
30		.16403		.16976		.17550		.18123			30
31		.16950		.17542		.18135		.18727			31
		14.°4		14.°9		15.°4		15.°9			
20		.11012		.11394		.11776		.12159			20
21	.1	.11562	55	.11964	57	.12365	59	.12767	61	.1	21
22	.2	.12113	110	.12533	114	.12954	118	.13375	122	.2	22
23	.3	.12663	165	.13103	171	.13543	177	.13983	182	.3	23
24	.4	.13214	220	.13673	228	.14132	236	.14590	243	.4	24
25	.5	.13765	275	.14243	285	.14720	294	.15198	304	.5	25
26	.6	.14314	330	.14812	342	.15309	353	.15806	365	.6	26
27	.7	.14866	385	.15382	399	.15898	412	.16414	426	.7	27
28	.8	.15416	440	.15952	456	.16487	471	.17022	486	.8	28
29	.9	.15969	496	.16521	513	.17076	530	.17630	547	.9	29
30		.16517		.17091		.17665		.18238			30
31		.17068		.17661		.18253		.18846			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom.		(t.—t.′)=14°.				(t—t′)=15°.				Barom.
Inches.	Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	(t—t′) p. 87.18 30	Parts for Decls. Inches.	Decls. Inches.	Inches.
		16.°0		16.°5		17.°0		17.°5			
20		.12235		.12618		.13000		.13882			20
21	.1	12847	61	.13248	63	.13650	65	.14051	67	1	21
22	.2	13459	122	.13879	126	.14300	130	.14720	134	.2	22
23	.3	14070	184	.14510	189	.14950	195	.15390	201	.3	23
24	.4	14682	245	.15141	252	.15600	260	.16059	268	.4	24
25	.5	15294	306	.15772	315	.16250	325	.16728	335	.5	25
26	.6	15906	367	.16403	379	.16900	390	.17397	401	.6	26
27	.7	16517	428	.17034	442	.17550	455	.18066	468	.7	27
28	.8	17129	489	.17665	505	.18200	520	.18735	535	.8	28
29	.9	17741	551	.18295	568	.18850	585	.19404	602	.9	29
30		18353		.18926		.19500		.20073			30
31		18965		.19557		.20150		.20742			31
		16.°1	.....	16.°6	.....	17.°1	.....	17.°6			
20		12312		.12694		.13072		.13459			20
21	.1	12927	62	.13329	63	.13726	65	.14132	67	.1	21
22	.2	.13543	123	.13963	127	.14380	131	.14805	135	.2	22
23	.3	.14158	185	.14598	190	.15033	196	.15475	202	.3	23
24	.4	.14774	246	.15233	254	.15687	262	.16150	269	.4	24
25	.5	.15390	308	.15867	317	.16340	327	.16823	336	.5	25
26	.6	.16005	369	.16502	381	.16994	392	.17496	404	.6	26
27	.7	.16621	431	.17137	444	.17648	458	.18169	471	.7	27
28	.8	.17236	492	.17772	508	.18301	523	.18842	538	.8	28
29	.9	.17852	554	.18406	571	.18955	588	.19515	606	.9	29
30		.18467		.19041		.19609		.20188			30
31		.19083		.19676		.20262		.20861			31
		16.°2	.....	16.°7	.....	17.°2	.....	17.°7			
20		.12388		.12770		.13153		.13535			.20
21	.1	.13008	62	.13407	64	.13810	66	.14212	68	.1	.21
22	.2	.13627	134	.14048	128	.14468	132	.14839	135	.2	.22
23	.3	.14246	186	.14686	192	.15126	197	.15565	203	.3	.23
24	.4	.14866	248	.15325	255	.15783	263	.16246	271	.4	.24
25	.5	.15485	310	.15963	319	.16441	329	.16919	338	.5	.25
26	.6	.16105	372	.16602	383	.17099	395	.17596	406	.6	.26
27	.7	.16724	434	.17240	447	.17756	460	.18272	474	.7	.27
28	.8	.17343	496	.17879	511	.18414	526	.18949	541	.8	.28
29	.9	.17963	557	.18517	575	.19072	592	.19626	609	.9	.29
30		.18582		.19156		.19729		.20303			.30
31		.19202		.19794		.20387		.20980			.31
		16.°3	.....	16.°8	.....	17.°3	.....	17.°8			
20		.12465		.12847		.13229		.13612			20
21	.1	.13088	62	.13493	64	.13891	66	.14292	68	.1	21
22	.2	.13711	125	.14132	128	.14552	132	.14973	136	.2	22
23	.3	.14334	187	.14774	193	.15214	198	.15653	204	.3	23
24	.4	.14958	249	.15416	257	.15875	265	.16334	272	.4	24
25	.5	.15581	312	.16059	321	.16537	331	.17015	340	.5	25
26	.6	.16204	374	.16701	385	.17198	397	.17695	408	.6	26
27	.7	.16827	436	.17343	450	.17860	463	.18376	476	.7	27
28	.8	.17450	499	.17986	514	.18521	529	.19056	544	.8	28
29	.9	.18074	561	.18628	578	.19182	595	.19737	613	.9	29
30		.18697		.19270		.19843		.20417			30
31		.19320		.19913		.20504		.21091			31
		16.°4	.....	16.°9	.....	17.°4	.....	17.°9			
20		.12541		.12923		.13306		.13688			20
21	.1	.13168	63	.13570	65	.13971	67	.14373	68	.1	21
22	.2	.13795	125	.14216	129	.14636	133	.15057	137	.2	22
23	.3	.14422	188	.14862	194	.15302	200	.15741	205	.3	23
24	.4	.15049	251	.15508	258	.15967	266	.16426	274	.4	24
25	.5	.15676	314	.16154	323	.16632	333	.17110	342	.5	25
26	.6	.16303	376	.16800	388	.17297	399	.17795	411	.6	26
27	.7	.16930	439	.17447	452	.17963	466	.18479	479	.7	27
28	.8	.17557	502	.18093	517	.18628	532	.19163	548	.8	28
29	.9	.18185	564	.18739	582	.19293	599	.19848	616	.9	29
30		.18812		.19385		.19959		.20532			30
31		.19439		.20031		.20624		.21217			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom. Inches.	Decls. Inches.	(t.—t.′)=18°. (t—t′) p. / 87.18 30	Parts for Decls. Inches.	(t—t′) p. / 87.18 30	Parts for Decls. Inches.	(t.—t.′)=19°. (t—t′) p. / 87.18 30	Parts for Decls. Inches.	(t—t′) p. / 87.18 30	Parts for Decls. Inches.	Decls. Inches.	Barom. Inches.
		18.°0		18.°5		19.°0		19.°5			
20		.13765		.14147		.14529		.14912			20
21	.1	.14453	69	.14854	71	.15256	73	.15657	75	.1	21
22	.2	.15141	138	.15562	141	.15982	145	.16403	149	.2	22
23	.3	.15829	206	.16269	212	.16709	218	.17148	224	.3	23
24	.4	.16517	275	.16976	283	.17435	291	.17894	298	.4	24
25	.5	.17206	344	.17684	354	.18162	363	.18640	373	.5	25
26	.6	.17894	413	.18391	424	.18888	436	.19385	447	.6	26
27	.7	.18582	482	.19098	495	.19615	509	.20131	522	.7	27
28	.8	.19270	551	.19806	566	.20341	581	.20896	596	.8	28
29	.9	.19959	619	.20513	637	.21067	654	.21622	671	.9	29
30		.20647		.21220	707	.21794		.22367			30
31		.21335		.21928		.22520		.23113			31
		18.°1	.....	18.°6	.....	19.°1	.....	19.°6			
20		.13841		.14223		.14606		.14988			20
21	.1	.14533	69	.14935	71	.15336	73	.15737	75	.1	21
22	.2	.15225	138	.15646	142	.16066	146	.16487	150	.2	22
23	.3	.15917	208	.16357	213	.16797	219	.17236	225	.3	23
24	.4	.16609	277	.17068	284	.17527	292	.17986	300	.4	24
25	.5	.17301	346	.17779	356	.18257	365	.18735	375	.5	25
26	.6	.17993	415	.18490	427	.18987	438	.19485	450	.6	26
27	.7	.18685	484	.19202	498	.19718	511	.20234	525	.7	27
28	.8	.19375	554	.19913	569	.20448	584	.20983	600	.8	28
29	.9	.20070	623	.20624	640	.21178	657	.21733	674	.9	29
30		.20762		.21335		.21909		.22482			30
31		.21454		.22046		.22639	.....	.23232			31
		18.°2	.....	18.°7	.....	19.°2		19.°7			
20		.13918		.14300		.14682		.15065			20
21	.1	.14613	70	.15015	72	.15416	73	.15818	75	.1	21
22	.2	.15309	139	.15730	143	.16050	147	.16571	151	.2	22
23	.3	.16005	209	.16445	215	.16885	220	.17324	226	.3	23
24	.4	.16701	278	.17160	286	.17619	294	.18077	301	.4	24
25	.5	.17397	348	.17875	358	.18353	367	.18831	377	.5	25
26	.6	.18093	418	.18590	429	.19087	440	.19584	452	.6	26
27	.7	.18789	487	.19305	501	.19821	514	.20337	527	.7	27
28	.8	.19485	557	.20020	572	.20555	587	.21090	603	.8	28
29	.9	.20180	626	.20735	644	.21289	661	.21844	678	.9	29
30		.20876		.21450		.22023		.22597			30
31		.21572		.22165		.22757		.23350			31
		18.°3	.....	18.°8	.....	19.°3	.....	19.°8			
20		.13994		.14376		.14759		.15141			20
21	.1	.14693	70	.15095	72	.15497	74	.15898	76	.1	21
22	.2	.15393	140	.15814	144	.16235	148	.16655	151	.2	22
23	.3	.16093	210	.16533	216	.16972	221	.17412	227	.3	23
24	.4	.16793	280	.17252	288	.17710	295	.18169	303	.4	24
25	.5	.17492	350	.17970	359	.18448	369	.18926	379	.5	25
26	.6	.18192	420	.18689	431	.19186	443	.19683	454	.6	26
27	.7	.18892	490	.19408	503	.19924	577	.20440	530	.7	27
28	.8	.19592	560	.20127	575	.20662	590	.21197	606	.8	28
39	.9	.20291	630	.20846	647	.21400	664	.21955	681	.9	29
30		.20991		.21564		.22138		.22712			30
31		.21691		.22283		.22876		.23469			31
		18.°4	.....	18.°9	.....	19.°4	.....	19.°9			
20		.14070		.14453		.14835		.15218			20
21	.1	.14774	70	.15175	72	.15577	74	.15978	76	.1	21
22	.2	.15477	141	.15898	145	.16319	148	.16739	152	.2	22
23	.3	.16181	211	.16621	217	.17060	223	.17500	228	.3	23
24	.4	.16885	281	.17343	289	.17802	297	.18261	304	.4	24
25	.5	.17538	352	.18066	361	.18544	371	.19022	380	.5	25
26	.6	.18292	422	.18789	434	.19286	445	.19783	457	.6	26
27	.7	.18995	492	.19511	506	.20027	519	.20544	533	.7	27
28	.8	.19699	563	.20234	577	.20769	593	.21305	609	.8	28
29	.9	.20402	633	.20957	650	.21511	668	.22065	685	.9	29
30		.21106		.21679		.22253		.22826			30
31		.21809		.22402		.22995		.23587			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom.		(t.—t.′)=20°.				(t.—t.′)=21°.				Barom.
Inches.	Decls. Inches.	(t—t′) p. 87.18 / X 30	Parts for Decls. Inches.	(t—t′) p. 87.18 / X 30	Parts for Decls. Inches.	(t—t′) p. 87.18 / X 30	Parts for Decls. Inches.	(t—t′) p. 87.18 / X 30	Parts for Decls. Inches.	Decls. Inches.	Inches.
		20.°0		20.°5		21.°0		21.°5			
20		.15294		.15676		.16059		.16441			20
21	.1	.16059	76	.16460	78	.16862	80	.17263	82	.1	21
22	.2	.16823	153	.17244	157	.17665	161	.18085	164	.2	22
23	.3	.17588	229	.18028	235	.18467	241	.18907	247	.3	23
24	.4	.18353	306	.18812	314	.19270	321	.19729	329	.4	24
25	.5	.19117	382	.19595	392	.20073	401	.20551	411	.5	25
26	.6	.19882	459	.20379	470	.20876	482	.21373	493	.6	26
27	.7	.20447	535	.21163	549	.21679	562	.22195	575	.7	27
28	.8	.21412	612	.21947	627	.22482	642	.23017	658	.8	28
29	.9	.22176	688	.22731	705	.23285	723	.23840	740	.9	29
30		.22941		.23514		.24088		.24662			30
31		.23707		.24298		.24891		.25434			31
		20.°1	.....	20.°6	.....	21.°1	.....	21.°6			
20		.15370		.15753		.16135		.16517			20
21	.1	.16139	77	.16540	79	.16942	81	.17343	83	.1	21
22	.2	.16907	154	.17328	158	.17749	161	.18169	165	.2	22
23	.3	.17676	231	.18116	236	.18555	242	.18995	248	.3	23
24	.4	.18445	307	.18903	315	.19362	323	.19821	330	.4	24
25	.5	.19213	384	.19691	394	.20169	403	.20646	413	.5	25
26	.6	.19982	461	.20479	473	.20976	484	.21473	496	.6	26
27	.7	.20750	538	.21266	551	.21782	565	.22299	578	.7	27
28	.8	.21519	615	.22054	630	.22589	645	.23125	661	.8	28
29	.9	.22287	692	.22842	709	.23396	726	.23950	743	.9	29
30		.23056		.23629		.24203		.24776			30
31		.23824		.24417		.25010		.25602			31
		20.°2	.....	20.°7	.....	21.°2	.....	21,°7			
20		.15447		.15829		.16212		.16594			20
21	.1	.16219	77	.16621	79	.17022	81	.17424	83	.1	21
22	.2	.16992	154	.17412	158	.17833	162	.18253	166	.2	22
23	.3	.17764	232	.18204	237	.18643	243	.19083	249	.3	23
24	.4	.18536	309	.18995	317	.19454	324	.19913	332	.4	24
25	.5	.19309	386	.19787	396	.20265	405	.20742	415	.5	25
26	.6	.20081	463	.20578	475	.21075	486	.21572	498	.6	26
27	.7	.20853	541	.21370	554	.21886	567	.22402	581	.7	27
28	.8	.21626	618	.22161	633	.22696	648	.23232	664	.8	28
29	.9	.22398	695	.22952	712	.23507	730	.24061	747	.9	29
30		.23170		.23544		.24317		.24891			30
31		.23943		.24535		.25128		.25721			31
		20.°3	.....	20.°8	.....	21.°3	.....	21.°8			
20		.15523		.15906		.16288		.16670			20
21	.1	.16300	78	.16701	80	.17102	81	.17504	83	.1	21
22	.2	.17076	153	.17496	159	.17917	163	.18337	167	.2	22
23	.3	.17852	233	.18292	239	.18731	244	.19171	250	.3	23
24	.4	.18628	310	.19087	318	.19546	326	.20005	333	.4	24
25	.5	.19404	388	.19882	398	.20360	407	.20838	417	.5	25
26	.6	.20180	466	.20677	477	.21175	489	.21672	500	.6	26
27	.7	.20957	543	.21473	557	.21989	570	.22505	583	.7	27
28	.8	.21733	621	.22268	636	.22803	652	.23339	667	.8	28
29	.9	.22509	699	.23063	716	.23618	733	.24172	750	.9	29
30		.23285		.23859		.24432		.25006			30
31		.24061		.24654		.25247		.25839			31
		20.°4	.....	20.°9	.....	21.°4	.....	21.°9			
20		.15600		.15982		.16365		.16747			20
21	.1	.16380	78	.16781	80	.17183	82	.17584	84	.1	21
22	.2	.17160	156	.17580	160	.18001	164	.18422	167	.2	22
23	.3	.17940	234	.18380	240	.18819	245	.19259	251	.3	23
24	.4	.18720	312	.19179	320	.19637	327	.20096	335	.4	24
25	.5	.19500	390	.19978	400	.20456	409	.20934	419	.5	25
26	.6	.20280	468	.20777	479	.21174	491	.21771	502	.6	26
27	.7	.21060	546	.21576	559	.22092	573	.22608	586	.7	27
28	.8	.21840	624	.22375	639	.22910	655	.23446	670	.8	28
29	.9	.22620	702	.23174	718	.23729	736	.24283	754	.9	29
30		.23300		.23973		.24547		.25120			30
31		.24180		.24772		.25365		.25958			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom. Inches.	Decl. Inches.	(t.—t.′)=22°. (t—t′) p. / 87.18 30	Parts for Decl. Inches.	(t—t′) p. / 87.18 30	Parts for Decl. Inches.	(t—t′)=23°. (t—t′) p. / 87.18 30	Parts for Decl. Inches.	(t—t′) p. / 87.18 30	Parts for Decl. Inches.	Decl. Inches.	Barom. Inches.
		22.°0		22.°5		23.°0		23.°5			
20		.16823		.17206		.17588		.17970			20
21	.1	.17665	84	.18066	86	.18467	88	.18869	90.	.1	21
22	.2	.18506	168	.18926	172	.19347	176	.19767	180.	.2	22
23	.3	.19347	252	.19787	258	.20226	264	.20666	270.	.3	23
24	.4	.20188	336	.20647	344	.21106	252	.21565	359.	.4	24
25	.5	.21029	421	.21507	430	.21985	440	.22463	449.	.5	25
26	.6	.21870	505	.22367	516	.22865	528	.23362	539.	.6	26
27	.9	.22712	589	.23228	602	.23744	616	.24260	629.	.7	27
28	.7	.23553	673	.24088	688	.24623	704	.25159	719.	.8	28
29	.8	.24394	757	.24948	774	.25503	791	.26057	809.	.9	29
30		.25235		.25809		.26382		.26956			30
31		.26076		.26669		.27262		.27854			31
		22.°1	.....	22.°6	.....	23.°1	.....	23.°6			
20		.16900		.17282		.17665		.18047			20
21	.1	.17745	85	.18146	86	.18548	88	.18949	90	.1	21
22	.2	.18590	170	.19010	173	.19431	177	.19852	180	.2	22
23	.3	.19435	254	.19875	259	.20314	265	.20754	271	.3	23
24	.4	.20280	338	.20739	346	.21197	353	.21656	361	.4	24
25	.5	.21125	423	.21603	432	.22081	442	.22559	451	.5	25
26	.6	.21970	507	.22467	518	.22964	530	.23461	541	.6	26
27	.7	.22815	592	.23331	605	.23847	618	.24363	632	.7	27
28	.8	.23660	675	.24195	691	.24730	707	.25266	722	.8	28
29	.9	.24505	761	.25059	778	.25614	795	.26168	812	.9	29
30		.25350		.25923		.26497		.27070	902		30
31		.26195		.26787		.27380		.27973			31
		22.°2	.....	22.°7	.....	23.°2	.....	23.°7			
20		.16976		.17359		.17741		.18123			20
21	.1	.17825	85	.18227	86	.18628	89	.19030	91	.1	21
22	.2	.18674	170	.19095	174	.19515	177	.19936	181	.2	22
23	.3	.19528	255	.19962	260	.20402	266	.20842	272	.3	23
24	.4	.20372	340	.20830	347	.21289	355	.21748	362	.4	24
25	.5	.21220	424	.21698	434	.22176	444	.22654	453	.5	25
26	.6	.22069	509	.22566	521	.23063	532	.23560	544	.6	26
27	.7	.22918	594	.23434	608	.23950	621	.24467	634	.7	27
28	.8	.23767	678	.24302	694	.24837	710	.25373	725	.8	28
29	.9	.24616	764	.25170	781	.25724	798	.26279	816	.9	29
30		.25465		.26038		.26612		.27185			30
31		.26313		.26906		.27499		.28091			31
		22.°3	.....	22.°8	.....	23.°3	.....	23.°8			
20		.17053		.17435		.17817		.18200			20
21	.1	.17905	85	.18307	87	.18708	89	.19110	91	.1	21
22	.2	.18758	171	.19179	174	.19599	178	.20020	182	.2	22
23	.3	.19611	256	.20050	262	.20490	267	.20930	273	.3	23
24	.4	.20463	341	.20922	349	.21381	256	.21840	364	.4	24
25	.5	.21316	426	.21794	436	.22272	445	.22750	455	.5	25
26	.6	.22169	512	.22666	523	.23163	535	.23660	546	.6	26
27	.7	.23021	597	.23537	610	.24054	624	.24570	637	.7	27
28	.8	.23874	682	.24409	697	.24944	713	.25480	728	.8	28
29	.9	.24727	767	.25281	785	.25835	802	.26390	819	.9	29
30		.25579		.26153		.26726		.27300			30
31		.26432		.27024		.27617		.28210			31
		22.°4	.....	22.°9	.....	22.°4	.....	23.°9			
20		.17129		.17512		.17894		.18276			20
21	.1	.17986	86	.18387	88	.18789	89	.19190	91	.1	21
22	.2	.18842	171	.19263	175	.19683	179	.20104	183	.2	22
23	.3	.19699	257	.20138	263	.20578	268	.21018	274	.3	23
24	.4	.20555	343	.21014	350	.21473	358	.21932	366	.4	24
25	.5	.21412	428	.21890	438	.22367	447	.22845	457	.5	25
26	.6	.22268	514	.22765	525	.23262	537	.23759	548	.6	26
27	.7	.23125	600	.23641	613	.24157	626	.24673	640	.7	27
28	.8	.23981	685	.24516	700	.25052	716	.25587	731	.8	28
29	.9	.24837	771	.25392	788	.25946	805	.26501	822	.9	29
30		.25694		.26267		.26841		.27414			30
31		.26550		.27143		.27736		.28328			31

TABLE I,—*Apjohn's Hygrometric Tables.*—(*Continued.*)

Barom. Inches.	Decl. Inches.	(t.—t.′) 24°. (t—t′)p. / 87.18 30	Parts for Decl. Inches.	(t—t′) p. / 87.18 30	Part for Decl. Inches.	(t.—t.′)=25°. (t—t′)p. / 87.18 30	Parts for Decl. Inches.	(t—t′) p. / 87.18 30	Parts for Decl. Inches.	Decl. Inches.	Barom. Inches.
		24.°0		24.°5		25.°0		25.°5			
20		.18353		.18735		.19117		.19500			20
21	.1	.19270	92	.19672	94	.20073	96	.20475	98	.1	21
22	.2	.20188	184	.20609	187	.21029	191	.21450	195	.2	22
23	.3	.21106	275	.21545	281	.21985	287	.22425	293	.3	23
24	.4	.22023	367	.22482	375	.22941	382	.23400	390	.4	24
25	.5	.22941	460	.23420	468	.23897	478	.24375	488	.5	25
26	.6	.23859	551	.24356	562	.24853	574	.25350	585	.6	26
27	.7	.24776	642	.25292	656	.25809	669	.26325	683	.7	27
28	.8	.25694	734	.26229	749	.26764	765	.27300	780	.8	28
29	.9	.26612	826	.27166	843	.27720	860	.28275	878	.9	29
30		.27529		.28103		.28676		.29250			30
31		.28447		.29039		.29632		.30225			31
		24.°1	.....	24.°6	.....	25.°1	.....	25.°6			
20		.18429		.18812		.19194		.19576			20
21	.1	.19351	92	.19752	94	.20154	96	.20555	98	.1	21
22	.2	.20272	184	.20693	188	.21113	192	.21534	196	.2	22
23	.3	.21194	276	.21633	282	.22073	288	.22513	294	.3	23
24	.4	.22115	369	.22574	376	.23033	384	.23492	392	.4	24
25	.5	.23037	461	.23515	470	.24992	490	.24470	489	.5	25
26	.6	.23958	553	.24455	564	.24952	576	.25449	587	.6	26
27	.7	.24879	645	.25396	658	.25912	672	.26428	685	.7	27
28	.8	.25801	737	.26336	753	.26872	768	.27407	783	.8	28
29	.9	.26722	829	.27277	847	.27831	864	.28386	881	.9	29
30		.27644		.28217		28791		.29364			30
31		.28565		.29158		.29751		.30343			31
		24.°2	.....	24.°7	.....	25.°2	.....	25.°7			
20		.18506		.18888		.19270		.19653			20
21	.1	.19431	93	.19832	94	.20234	96	.20635	98	.1	21
22	.2	.20356	185	.20777	189	.21197	193	.21618	197	.2	22
23	.3	.21282	278	.21721	283	.22161	289	.22600	295	.3	23
24	.4	.22207	370	.22666	378	.23124	385	.23583	393	.4	24
25	.5	.23132	463	.23610	472	.24088	482	.24566	491	.5	25
26	.6	.24057	555	.24555	566	.25052	578	.25549	590	.6	26
27	.7	.24983	648	.25499	661	.26015	675	.26529	688	.7	27
28	.8	.25908	740	.26443	756	.26979	771	.27514	786	.8	28
29	.9	.26833	833	.27388	851	.27942	867	.28497	884	.9	29
30		.27759		.28332		.28906		.29479			30
31		.28684		.29277		.29869		.30462			31
		24.°3	.....	24.°8	.....	25.°3	.....	25.°8			
20		.28582		.18965		.19347		.19729			20
21	.1	.29511	93	.19913	95	.20314	97	.20716	99	.1	21
22	.2	.20440	186	.20861	190	.21282	194	.21702	197	.2	22
23	.3	.21370	279	.21809	285	.22249	290	.22689	296	.3	23
24	.4	.22299	372	.22757	379	.23216	387	.23675	395	.4	24
25	.5	.23228	465	.23707	474	.24184	484	.24662	493	.5	25
26	.6	.24157	558	.24654	569	.25151	580	.25648	592	.6	26
27	.7	.25086	650	.25602	664	.26118	677	.26634	691	.7	27
28	.8	.26015	743	.26550	759	.27086	774	.27621	789	.8	28
29	.9	.26944	836	.27499	853	.28053	871	.28607	888	.9	29
30		.27873		.28447		.29020		.29594			30
31		.28802		.29359		.29988		.30580			31
		24.°4	.....	24.°9	.....	25.°4	.....	25.°9			
20		.18659		.19041		.19423		.19806			20
21	.1	.19592	95	.19993	95	.20394	97	.20796	99	.1	21
26	.2	.20524	189	.20945	190	.21366	194	.23179	198	.2	22
23	.3	.21457	284	.21897	286	.22337	291	.22777	297	.3	23
24	.4	.22390	379	.22849	381	.23308	389	.23767	396	.4	24
25	.5	.23323	473	.23801	470	.24279	486	.24757	495	.5	25
26	.6	.24256	568	.24753	571	.25250	583	.25747	594	.6	26
27	.7	.25189	662	.25705	660	.26222	680	.26738	693	.7	27
28	.8	.26122	757	.26657	762	.27193	777	27728	792	.8	28
29	.9	.27055	852	.27609	857	.28164	874	.28718	891	.9	29
30		.27988		.28562		.29135		.29709			30
31		.28921		.29514		.30106		.30699			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom. Inches.	Decl. Inches.	(t—t′)=26°. (t—t′) p. 87.18 30	Parts for Decl. Inches.	(t—t′) p. 87.18 30	Parts for Decl. Inches.	(t·—t.′)=27°. (t—t′) p. 87·18 30	Parts for Decl. Inches.	(t—t′) p. 87.18 30	Parts for Decl. Inches.	Decl. Inches.	Barom. Inches.
		26.°0		26.°5		27.°0		27.°5			
20		.19882		.20264		.20647		.21029			20
21	.1	.20876	99	.21278	101	.21679	103	.22081	105	.1	21
22	.2	.21870	199	.22298	203	.22712	207	.23132	210	.2	22
23	.3	.22864	298	.23304	304	.23744	310	.24184	315	.3	23
24	.4	.23859	398	.24317	405	.24776	413	.25235	421	.4	24
25	.5	.24853	497	.25331	507	.25809	516	.26287	526	.5	25
26	.6	.25847	597	.26344	608	.26841	619	.27338	631	.6	26
27	.7	.26841	696	.27357	709	.27873	723	.28389	736	.7	27
28	.8	.27835	795	.28370	811	.28906	826	.29441	841	.8	28
29	.9	.28829	895	.29384	912	.29938	929	.30492	946	.9	29
30		.29823		.30397		.30970		.31545			30
31		.30817		.31400		.32003		.32595			31
		26.°1	.....	26.°6	.....	27.°1	.....	27.°6			
20		.19959		.30341		.20723		.21106			20
21	.1	.20957	100	.21358	102	.21759	104	.22162	106	.1	21
22	.2	.21955	200	.22375	202	.22796	207	.23217	211	.2	22
23	.3	.22952	299	.23392	305	.23832	311	.24272	317	.3	23
24	.4	.23950	399	.24409	407	.24868	415	.25328	422	.4	24
25	.5	.24948	499	25426	509	.25904	518	.26383	528	.5	25
26	.6	.25946	599	.26443	610	.26940	622	.27438	633	.6	26
27	.7	.26944	699	.27460	712	.27977	725	.28494	739	.7	27
28	.8	.27943	798	.28477	814	.29013	829	.29549	844	.8	28
29	.9	.28940	898	.29494	915	.30049	933	.30604	950	.9	29
30		.29938		.30511		.31085		.31660			30
31		.30936		.31529		.32121		.32715			31
		26.°2	.....	26.°7	.....	27.°2	.....	27.°7			
20		.20035		.20417		.20800		.21182			20
21	.1	.21037	100	.21438	102	.21840	104	.22241	106	.1	21
22	.2	.22039	200	.22459	204	.22880	208	.23300	212	.2	22
23	.3	.23041	301	.23480	306	.23920	312	.24359	318	.3	23
24	.4	.24042	401	.24501	408	.24960	416	.25419	424	.4	24
25	.5	.25044	501	.25522	510	.26000	520	.26478	530	.5	25
26	.6	.26046	601	.26543	613	.27040	624	.27537	636	.6	26
27	.7	.27047	701	.27564	715	.28080	728	.28596	741	.7	27
28	.8	.28049	801	.28584	817	.29120	832	29655	847	.8	28
29	.9	.29051	902	.29605	919	.30160	936	.30714	953	.9	29
30		.30053		.30626		.31020		.31773			33
31		.31054		.31647		.32240		.32832			31
		26.°3	.....	26.°8	.....	27.°3	.....	27.°8			
20		.20112		.20494		.20876		.21259			20
21	.1	.21117	101	.21519	103	.21920	104	.22322	106	.1	21
22	.2	.22123	201	.22543	205	.22964	209	.23384	213	.2	22
23	.3	.23128	302	.23568	307	.24008	313	.24447	319	.3	23
24	.4	.24134	402	.24593	410	.25052	418	.25510	425	.4	24
25	.5	.25139	503	.25617	512	.26095	522	.26573	531	.5	25
26	.6	.26145	603	.26646	615	.27139	626	.27636	638	.6	26
27	.7	.27151	704	.27677	717	.28183	731	.28699	744	.7	27
28	.8	.28156	805	.28691	820	.29227	835	.29762	850	.8	28
29	.9	.29162	905	.29717	922	.30271	939	.30825	957	.9	29
30		.30167		.30741		.31314		.31880			30
31		.31173		.31776		.32358		.32951			31
		26.°4	.....	26.°9	.....	27.°4	.....	27.°9			
20		.20188		.20570		.20953		.21335			20
21	.1	.21197	101	.21599	103	.22000	105	.22402	107	·1	21
22	.2	.22207	202	.22627	206	.23048	210	.23469	213	.2	22
23	.3	.23216	303	.23656	309	.24096	314	.24535	320	.3	23
24	.4	.24226	404	.24684	411	.25143	419	.25601	427	.4	24
25	.5	.25235	505	.25713	514	.26191	524	.26669	533	.5	25
26	.6	.26244	606	.26742	617	.27239	629	.27736	640	.6	26
27	.7	.27254	707	.27770	720	.28286	733	.28802	747	.7	27
28	.8	.28263	808	.28799	823	.29334	838	.29869	153	.8	28
29	.9	.29273	909	.29827	926	.30381	943	.30936	960	.9	29
30		.30282		.30856		.31429		.32003			30
31		.31291		·31884		.32477		.33069			31

TABLE I,—*Apjohn's Hygrometric Tables.—(Continued.)*

Barom. Inches.	Decl. Inches.	(t.—t.′)=28°0. (t—t′) p. / 87.18 × 30	Parts for Decl. Inches.	(t.—t.′)=28°5. (t—t′) p. / 87.18 × 30	Parts for Decl. Inches.	(t.—t.′)=29°. (t—t′) p. / 87.18 × 30	Parts for Decl. Inches.	(t.—t.′)=29°5. (t—t′) p. / 87.18 × 30	Parts for Decl. Inches.	Decl. Inches.	Barom. Inches.
		28.°0		28.°5		29.°0		29.°5			
20		.21412		.21794		.22176		.22559			20
21	.1	.22482	107	.22884	109	.23285	111	.23687	113	.1	21
22	.2	.23553	214	.23973	218	.24394	222	.24814	226	.2	22
23	.3	.24623	321	.25063	327	.25503	333	.25942	338	.3	23
24	.4	.25694	428	.26153	436	.26612	444	.27070	451	.4	24
25	.5	.26764	535	.27242	545	.27721	554	.28198	564	.5	25
26	.6	.27835	642	.28332	654	.28829	665	.29326	677	.6	26
27	.7	.28906	749	.29422	763	.29938	776	.30454	790	.7	27
28	.8	.29976	857	.30511	872	.31047	887	.31582	902	.8	28
29	.9	.31047	964	.31600	981	.32156	998	.32710	1015	.9	29
30		.32117		.32691		.33264		.33838			30
31		.33188		.33781		.34373		.34965			31
		28.°1	.....	28.°6	.....	29.°1	.....	29.°6			
20		.21488		.21867		.22253		.22635			20
21	.1	.22562	107	.22961	109	.33365	111	.23767	113	.1	21
22	.2	.23637	215	.24054	219	.24478	223	.24899	226	.2	22
23	.3	.24711	322	.25148	328	.25591	334	.26030	340	.3	23
24	.4	.25786	430	.26242	438	.26703	445	.27162	453	.4	24
25	.5	.26860	537	.27336	547	.27816	556	.28294	566	.5	25
26	.6	.27934	645	.28430	656	.28929	668	.29426	679	.6	26
27	.7	.29009	752	.29524	766	.30041	779	.30559	792	.7	27
28	.8	.30083	860	.30618	875	.31154	890	.31689	905	.8	28
29	.9	.31157	967	.31712	984	.32266	1001	.32821	1019	.9	29
30		.32232		.32806		.33379		.33953			30
31		.33306		.33899		.34492		.35084			31
		28.°2	.....	28.°7	.....	29.°2	.....	29.°7			
20		.21564		.21947		.22329		.22712			20
21	.1	.22643	108	.23044	110	.23446	112	.23847	114	.1	21
22	.2	.23721	216	.24144	220	.24562	223	.24983	227	.2	22
23	.3	.24799	324	.25239	329	.25679	335	.26118	341	.3	23
24	.4	.25877	431	.26336	439	.26795	447	.27254	454	.4	24
25	.5	.26956	539	.27434	549	.27912	558	.28389	568	.5	25
26	.6	.28034	647	.28531	658	.29028	670	.29525	681	.6	26
27	.7	.29112	755	.29628	768	.30144	782	.30661	795	.7	27
28	.8	.30190	863	.30726	879	.31261	893	.31796	909	.8	28
29	.9	.31269	970	.31823	988	.32377	1006	.32932	1022	.9	29
30		.32347		.32920		.33494		.34067			30
31		.33425		.34018		.34610		.35203			31
		28.°3	.....	28.°8	.....	29.°3	.....	29.°8			
20		.21641		.22023		.22406		.22788			20
21	.1	.22723	108	.23124	110	.23526	112	.23927	114	.1	21
22	.2	.23805	216	.24226	220	.24646	224	.25067	228	.2	22
23	.3	.24887	325	.25327	330	.25767	336	.26206	342	.3	23
24	.4	.25969	433	.26428	440	.26887	448	.27346	456	.4	24
25	.5	.27051	541	.27529	551	.28007	560	.28485	570	.5	25
26	.6	.28133	649	.28630	661	.29127	672	.29624	684	.6	26
27	.7	.29215	757	.29731	771	.30248	784	.30764	798	.7	27
28	.8	.30297	866	.30833	881	.31368	896	.31903	912	.8	28
29	.9	.31379	974	.31934	991	.32488	1008	.33043	1026	.9	29
30		.32461		.33035		.33609		.34182			30
31		.33544		.34136		.34729		.35321			31
		28.°4	.....	28.°9	.....	29.°4	.....	29.°9			
20		.21717		.22100		.22482		.22864			20
21	.1	.22803	109	.23205	111	.23606	112	.24008	114	.1	21
22	.2	.23889	217	.24310	221	.24730	225	.25151	229	.2	22
23	.3	.24975	326	.25415	332	.25854	337	.26294	343	.3	23
24	.4	.26061	434	.26520	442	.26979	450	.27437	457	.4	24
25	.5	.27147	543	.27625	553	.28103	562	.28581	572	.5	25
26	.6	.28233	652	.28730	663	.29327	675	.29724	686	.6	26
27	.7	.29319	760	.29835	774	.30351	787	.30867	800	.7	27
28	.8	.30404	869	.30940	884	.31475	899	.32010	915	.8	28
29	.9	.31490	977	.32045	995	.32599	1012	.33154	1029	.9	29
30		.32576		.33150		.33723		.34297			30
31		.33652		.34255		.34857		.35440			31

Table II,—*Apjohn's Hygrometric Tables.*

Wet Bulb.	Depression of Bulb below Dry Thermometer in degrees, Fahrenheit.								Wet Bulb.
	1°	2°	3°	4°	5°	6°	7°	8°	
10	4	7	11	14	18	21	25	28	10
11	4	7	11	14	18	22	25	29	11
12	4	7	11	15	19	22	26	30	12
13	4	8	11	15	19	23	27	30	13
14	4	8	12	16	20	24	28	32	14
15	4	8	12	16	21	25	29	33	15
16	4	9	13	17	22	26	30	34	16
17	4	9	13	18	22	26	31	35	17
18	5	9	14	18	23	28	32	37	18
19	5	10	14	19	24	29	34	38	19
20	5	10	15	20	25	29	34	39	20
21	5	10	15	20	26	31	36	41	21
22	5	11	16	21	27	32	37	42	22
23	6	11	17	22	28	33	39	44	23
24	6	11	17	23	29	34	40	46	24
25	6	12	18	24	30	35	41	47	25
26	6	12	19	25	31	37	43	50	26
27	6	13	19	26	32	38	45	51	27
28	7	13	20	26	33	40	46	53	28
29	7	14	21	28	35	41	48	55	29
30	7	14	21	28	36	43	50	57	30
31	7	15	22	30	37	44	52	59	31
32	8	15	23	31	39	46	54	62	32
33	8	16	24	32	41	49	57	65	33
34	8	17	25	33	42	50	58	66	34
35	9	17	26	34	43	51	60	68	35
36	9	18	26	35	44	53	62	70	36
37	9	18	27	36	46	55	64	73	37
38	9	19	28	38	47	56	66	75	38
39	10	20	29	39	49	59	69	78	39
40	10	20	30	40	51	61	71	81	40
41	11	21	32	42	53	63	74	84	41
42	11	22	32	43	54	65	76	86	42
43	11	22	34	45	56	67	78	90	43
44	12	23	35	46	58	70	81	93	44
45	12	24	36	48	60	72	84	96	45
46	12	25	37	50	62	74	87	99	46
47	13	26	39	52	65	77	90	103	47
48	13	27	40	53	67	80	93	106	48
49	14	28	41	55	69	83	97	110	49
50	14	29	43	57	72	86	100	114	50
51	15	29	44	59	74	88	103	118	51
52	15	31	46	61	77	92	107	122	52
53	16	32	47	63	79	95	111	126	53
54	16	33	49	66	82	98	115	131	54
55	17	34	51	68	85	101	118	135	55
56	17	35	53	70	88	105	123	140	56
57	18	36	54	72	91	109	127	145	57
58	19	37	56	75	94	112	131	150	58
59	19	39	58	77	97	116	135	154	59
60	20	40	60	80	100	120	140	160	60
61	21	42	62	83	104	125	146	166	61
62	21	43	64	86	107	128	150	171	62
63	22	44	66	88	111	133	155	177	63
64	23	46	68	91	114	137	160	182	64
65	24	48	71	95	119	143	167	190	65
66	24	49	73	98	122	146	171	195	66
67	25	50	76	101	126	151	177	202	67
68	26	52	78	104	130	156	182	208	68
69	27	54	81	108	135	161	188	215	69
70	28	56	82	111	139	167	195	222	70

TABLE II,—*Apjohn's Hygrometric Tables.—(Continued.)*

Wet Bulb.	Depression of Wet Bulb below Dry Thermometer, in degrees Fahrenheit.								Wet Bulb.
	9°	10°	11°	12°	13°	14°	15°	16°	
10	32	35	39	42	46	49	53	56	10
11	32	36	40	43	47	50	54	58	11
12	33	37	41	44	48	52	56	59	12
13	34	38	42	46	49	53	57	61	13
14	36	40	44	48	52	56	60	64	14
15	37	41	45	49	53	57	62	66	15
16	39	43	47	52	56	60	65	69	16
17	40	44	48	53	57	62	66	70	17
18	41	46	51	55	60	64	69	74	18
19	43	48	53	58	62	67	72	77	19
20	44	49	54	59	64	69	74	78	20
21	46	51	56	61	66	71	77	82	21
22	48	53	58	64	69	74	80	85	22
23	50	55	61	66	72	77	83	88	23
24	51	57	63	68	74	80	86	91	24
25	53	59	65	71	77	83	89	94	25
26	56	62	68	74	81	87	93	99	26
27	58	64	71	77	83	90	96	102	27
28	59	66	73	79	86	92	99	106	28
29	62	69	76	83	90	97	104	110	29
30	64	71	78	85	92	99	107	114	30
31	67	74	81	89	96	104	111	118	31
32	69	77	85	92	100	108	116	123	32
33	73	81	89	97	105	113	122	130	33
34	75	83	91	100	108	116	125	133	34
35	77	85	94	102	111	119	128	136	35
36	79	88	97	106	114	123	132	141	36
37	82	91	100	109	118	127	137	146	37
38	85	94	103	113	122	132	141	150	38
39	88	98	108	118	127	137	147	157	39
40	91	101	111	121	131	141	152	162	40
41	95	105	116	126	137	147	158	168	41
42	97	108	119	130	140	151	162	173	42
43	101	112	123	134	146	157	168	179	43
44	104	116	128	139	151	162	174	186	44
45	108	120	132	144	156	168	180	192	45
46	112	124	136	149	161	174	186	198	46
47	116	129	142	155	168	181	194	206	47
48	120	133	146	160	173	186	200	213	48
49	124	138	152	166	179	193	207	221	49
50	129	143	157	172	186	200	215	229	50
51	132	147	162	176	191	206	221	235	51
52	138	153	168	184	199	214	230	245	52
53	142	158	174	190	205	221	237	253	53
54	148	164	180	197	213	230	246	262	54
55	152	169	186	203	220	237	254	270	55
56	158	175	193	210	228	245	263	280	56
57	163	181	199	217	235	253	272	290	57
58	168	187	206	224	243	262	281	299	58
59	174	193	212	232	251	270	290	309	59
60	180	200	220	240	260	280	300	320	60
61	187	208	229	250	270	291	312	333	61
62	193	214	235	257	278	300	321	342	52
63	199	221	243	265	287	309	332	354	63
64	205	228	251	274	296	319	342	365	64
65	214	238	262	286	309	333	357	381	65
66	220	244	268	293	317	342	366	390	66
67	227	252	277	302	328	353	378	403	67
68	234	260	286	312	338	364	390	416	68
69	242	269	296	323	350	377	404	430	69
70	250	278	306	334	361	389	417	445	70

TABLE II,—*Apjohn's Hygrometric Tables.—(Continued.)*

Wet Bulb.	Depression of Wet Bulb below Dry Thermometer, in degrees Fahrenheit.								Wet Bulb.
	1°	2°	3°	4°	5°	6°	7°	8°	
70	28	56	83	111	139	167	195	222	70
71	29	57	86	115	144	172	201	230	71
72	30	59	89	118	148	178	207	237	72
73	31	61	92	123	154	184	215	246	73
74	32	63	95	127	159	190	222	254	74
75	33	65	98	131	164	196	229	262	75
76	34	67	101	135	169	200	236	270	76
77	35	69	104	139	174	208	243	278	77
78	36	72	108	144	180	214	251	287	78
79	37	74	111	148	186	223	260	297	79
80	38	77	115	153	192	230	268	306	80
81	40	79	119	158	198	237	277	316	81
82	41	81	122	162	203	244	284	325	82
83	42	84	126	168	211	253	295	337	83
84	43	87	130	174	217	260	304	347	84
85	45	90	134	179	224	269	314	358	85
86	46	92	139	185	231	277	323	370	86
87	48	95	143	191	239	286	334	382	87
88	49	98	148	197	246	295	344	394	88
89	51	101	152	203	254	304	355	406	89
90	52	105	157	209	262	314	366	418	90
91	54	108	162	216	270	323	377	431	91
92	56	111	167	222	278	334	391	446	92
93	57	115	172	229	287	344	401	458	93
94	59	118	177	236	296	356	414	473	94
95	61	122	183	244	305	365	426	487	95
96	63	126	188	251	314	377	440	502	96
97	65	129	194	259	324	388	453	518	97
98	67	133	200	267	334	400	467	536	98
99	69	137	206	275	344	412	481	550	99
100	71	142	212	283	254	425	496	566	100
101	73	146	219	292	365	438	511	584	101
102	75	150	226	301	375	451	526	602	102
103	77	154	232	310	387	466	542	619	103
104	80	160	239	319	399	479	559	638	104
105	82	164	246	328	411	493	575	657	105
106	85	169	254	338	423	508	592	677	106
107	87	174	260	347	434	521	608	694	107
108	90	179	269	359	449	538	628	718	108
109	92	185	277	370	462	554	647	739	109
110	95	190	285	380	476	571	666	761	110
111	98	196	293	391	490	587	684	780	111
112	101	201	301	403	504	604	705	806	112
113	104	207	311	415	519	622	726	830	113
114	107	213	320	427	534	640	747	854	114
115	110	220	329	439	549	659	769	878	115
116	113	226	339	452	565	678	791	904	116
117	116	232	349	465	581	697	813	930	117
118	120	239	359	478	598	718	837	957	118
119	123	247	370	494	617	740	864	987	119
120	127	253	379	506	633	759	896	1012	120
121	130	260	390	520	651	781	911	1041	121
122	134	268	401	535	669	803	937	1071	122
123	138	275	413	550	688	826	963	1101	123
124	142	283	425	566	708	849	981	1122	124
125	146	291	437	582	728	873	1018	1164	125
126	150	299	449	598	748	898	1047	1197	126
127	154	307	461	615	769	922	1076	1230	127
128	158	316	474	632	790	947	1105	1263	128
129	162	325	487	650	812	974	1137	1299	129
130	167	334	501	668	835	1001	1168	1335	130

TABLE II.—*Apjohn's Hygrometric Tables.—(Continued.)*

Wet Bulb.	Depression of Wet Bulb below Dry Thermometer, in degrees Fahrenheit.								Wet Bulb.
	9°	10°	11°	12°	13°	14°	15°	16°	
70	250	278	306	334	361	389	417	445	70
71	258	287	316	344	373	402	431	459	71
72	266	296	326	355	385	414	444	474	72
73	276	307	338	368	399	430	461	491	73
74	285	317	349	380	412	444	476	507	74
75	294	327	360	392	425	458	491	523	75
76	303	337	371	404	438	472	506	539	76
77	312	347	382	416	451	486	521	555	77
78	323	359	395	431	467	503	539	574	78
79	334	371	408	445	482	519	557	594	79
80	345	383	421	460	498	536	575	613	80
81	356	395	435	474	514	553	593	632	81
82	365	406	447	487	528	568	609	650	82
83	379	411	463	505	547	589	632	674	83
84	391	434	477	521	564	608	651	694	84
85	403	448	493	538	582	627	672	717	85
86	416	462	508	554	601	647	693	739	86
87	429	477	525	572	620	668	716	763	87
88	443	492	541	590	640	689	738	787	88
89	456	507	558	608	659	710	761	811	89
90	461	523	575	628	680	732	785	837	90
91	475	539	593	647	701	755	809	862	91
92	508	557	612	667	723	778	834	890	92
93	516	573	630	688	745	802	860	917	93
94	532	591	650	709	768	827	887	946	94
95	548	609	670	731	792	853	914	974	95
96	565	628	691	754	816	879	942	1004	96
97	582	647	712	776	841	906	971	1035	97
98	600	667	734	800	867	934	1001	1067	98
99	618	687	756	824	893	962	1031	1099	99
100	637	708	779	850	920	991	1062	1133	100
101	657	730	803	876	949	1022	1095	1168	101
102	677	752	827	902	978	1053	1128	1203	102
103	697	774	851	929	1006	1084	1161	1238	103
104	718	798	878	958	1037	1117	1197	1277	104
105	739	821	903	985	1067	1149	1232	1314	105
106	761	846	931	1015	1100	1184	1269	1354	106
107	781	868	955	1042	1128	1215	1302	1389	107
108	807	897	987	1076	1166	1256	1346	1435	108
109	832	924	1016	1109	1201	1294	1386	1478	109
110	856	951	1046	1141	1236	1331	1427	1522	110
111	880	978	1076	1174	1271	1369	1467	1565	111
112	906	1007	1108	1208	1309	1410	1511	1611	112
113	933	1037	1141	1244	1348	1452	1556	1659	113
114	960	1067	1174	1280	1387	1494	1601	1707	114
115	988	1098	1208	1318	1427	1537	1647	1757	115
116	1017	1130	1243	1356	1469	1582	1695	1808	116
117	1046	1162	1278	1394	1511	1627	1743	1859	117
118	1076	1196	1316	1435	1555	1674	1794	1914	118
119	1111	1234	1357	1481	1604	1728	1851	1974	119
120	1139	1265	1392	1518	1645	1771	1898	2024	120
121	1171	1301	1431	1561	1691	1821	1952	2082	121
122	1204	1338	1472	1606	1739	1873	2007	2141	122
123	1238	1376	1514	1651	1789	1926	2064	2202	123
124	1264	1415	1537	1698	1840	1981	2123	2264	124
125	1310	1455	1601	1746	1892	2037	2183	2328	125
126	1346	1496	1646	1795	1945	2094	2244	2394	126
127	1383	1537	1691	1844	1998	2152	2306	2459	127
128	1421	1579	1737	1895	2053	2211	2369	2526	128
129	1462	1624	1786	1949	2111	2274	2436	2598	129
130	1502	1699	1836	2003	2170	2337	2504	2670	130

TABLE II,—*Apjohn's Hygrometric Tables.—(Continued.)*

Wet Bulb.	Depression of Wet Bulb below Dry Thermometer, in degrees Fahrenheit.								Wet Bulb.
	17°	18°	19°	20°	21°	22°	23°	24°	
70	473	500	528	556	584	612	639	667	70
71	488	517	545	574	603	631	660	689	71
72	503	533	562	592	622	651	681	710	72
73	522	553	583	614	645	675	706	737	73
74	539	571	602	634	666	697	729	761	74
75	556	589	621	654	687	719	752	785	75
76	573	607	640	674	708	741	775	809	76
77	590	625	659	694	729	763	798	833	77
78	610	646	682	718	754	790	826	862	78
79	631	668	705	742	779	816	853	890	79
80	651	689	728	766	804	843	881	919	80
81	672	711	751	790	830	869	909	948	81
82	690	731	771	812	853	893	934	974	82
83	716	758	800	842	884	926	968	1010	83
84	738	781	825	868	911	955	998	1042	84
85	762	806	851	896	941	986	1050	1075	85
86	785	832	878	924	970	1016	1063	1109	86
87	811	859	906	954	1002	1049	1097	1145	87
88	836	886	935	984	1033	1082	1132	1181	88
89	862	913	963	1014	1065	1115	1166	1217	89
90	889	941	994	1046	1098	1151	1203	1255	90
91	916	970	1024	1078	1132	1186	1240	1294	91
92	945	1001	1056	1112	1168	1223	1279	1334	92
93	974	1031	1089	1146	1203	1261	1318	1375	93
94	1005	1064	1123	1182	1241	1300	1359	1418	94
95	1035	1096	1157	1218	1279	1340	1401	1462	95
96	1068	1130	1193	1256	1319	1382	1444	1507	96
97	1100	1165	1229	1294	1359	1423	1488	1553	97
98	1134	1201	1267	1334	1401	1467	1534	1601	98
99	1168	1237	1305	1374	1443	1511	1580	1649	99
100	1204	1274	1345	1416	1487	1558	1628	1699	100
101	1241	1314	1389	1460	1533	1606	1679	1752	101
102	1278	1354	1429	1504	1579	1654	1730	1805	102
103	1316	1393	1471	1548	1625	1703	1780	1858	103
104	1357	1436	1516	1596	1676	1756	1835	1915	104
105	1396	1478	1560	1642	1724	1806	1888	1970	105
106	1438	1523	1607	1692	1777	1861	1946	2030	106
107	1476	1562	1649	1736	1823	1910	1996	2083	107
108	1525	1614	1704	1794	1884	1973	2063	2153	108
109	1571	1663	1756	1848	1940	2033	2125	2218	109
110	1617	1712	1807	1902	1997	2092	2187	2282	110
111	1663	1760	1858	1956	2054	2152	2249	2347	111
112	1712	1813	1913	2014	2115	2215	2316	2417	112
113	1763	1867	1970	2074	2178	2281	2385	2489	113
114	1814	1921	2027	2134	2241	2347	2454	2561	114
115	1867	1976	2086	2196	2306	2416	2525	2635	115
116	1921	2034	2147	2260	2373	2486	2599	2712	116
117	1975	2092	2208	2324	2440	2556	2673	2789	117
118	2033	2153	2272	2392	2512	2631	2751	2870	118
119	2098	2221	2345	2468	2591	2715	2838	2962	119
120	2151	2277	2404	2530	2657	2783	2910	3036	120
121	2212	2342	2472	2602	2732	2862	2992	3122	121
122	2275	2408	2542	2676	2810	2944	3077	3211	122
123	2339	2477	2614	2752	2890	3027	3165	3302	123
124	2406	2547	2689	2830	2972	3113	3255	3396	124
125	2474	2619	2765	2910	3056	3201	3346	3492	125
126	2543	2693	2842	2992	3142	3291	3440	3590	126
127	2613	2767	2920	3074	3228	3381	3535	3689	127
128	2684	2842	3000	3158	3316	3474	3632	3790	128
129	2761	2923	3086	3248	3410	3573	3735	3898	129
130	2837	3004	3171	3338	3505	3672	3839	4006	130

TABLE II,—*Apjohn's Hygrometric Tables.—(Continued.)*

Wet Bulb.	Depression of Wet Bulb below Dry Thermometer, in degrees Fahrenheit.								Wet Bulb
	25°	26°	27°	28°	29°	30°	00	00	00
70	695	723	751	778	806	834			
71	718	746	775	804	832	861			
72	740	770	799	829	858	888			
73	768	798	829	860	890	921			
74	793	824	856	888	919	951			
75	818	850	883	916	948	981			
76	843	876	910	944	977	1011			
77	868	902	937	972	1006	1041			
78	898	933	969	1005	1041	1077			
79	928	965	1002	1039	1076	1113			
80	958	996	1034	1072	1111	1149			
81	988	1027	1067	1106	1146	1185			
82	1015	1056	1096	1137	1177	1218			
83	1053	1095	1137	1179	1221	1263			
84	1085	1128	1172	1215	1259	1302			
85	1120	1165	1210	1254	1299	1344			
86	1155	1201	1247	1294	1340	1386			
87	1193	1240	1288	1336	1383	1431			
88	1230	1279	1328	1378	1427	1476			
89	1268	1318	1369	1420	1470	1521			
90	1308	1360	1412	1464	1517	1569			
91	1348	1401	1455	1509	1563	1617			
92	1390	1446	1501	1557	1612	1668			
93	1433	1490	1547	1604	1662	1719			
94	1478	1537	1596	1655	1714	1773			
95	1523	1583	1644	1705	1766	1827			
96	1570	1633	1696	1758	1821	1884			
97	1618	1682	1747	1812	1876	1941			
98	1668	1734	1801	1868	1934	2001			
99	1718	1786	1855	1924	1992	2061			
100	1770	1841	1912	1982	2053	2124			
101	1825	1898	1971	2044	2117	2190			
102	1880	1955	2030	2106	2181	2256			
103	1935	2012	2090	2167	2245	2322			
104	1995	2075	2155	2234	2314	2394			
105	2053	2135	2217	2299	2381	2463			
106	2115	2200	2234	2369	2453	2538			
107	2170	2257	2344	2430	2517	2604			
108	2243	2332	2422	2512	2601	2691			
109	2310	2402	2495	2587	2680	2772			
110	2378	2473	2568	2663	2758	2853			
111	2445	2543	2641	2738	2836	2934			
112	2518	2618	2719	2820	2920	3021			
113	2593	2696	2800	2904	3007	3111			
114	2668	2774	2881	2988	3094	3201			
115	2745	2855	2965	3074	3184	3294			
116	2825	2938	3051	3164	3277	3390			
117	2905	3021	3137	3254	3370	3486			
118	2990	3110	3229	3349	3468	3588			
119	3085	3208	3332	3455	3579	3702			
120	3163	3289	3416	3542	3669	3795			
121	3253	3383	3513	3643	3773	3903			
122	3345	3479	3613	3746	3880	4014			
123	3440	3578	3715	3853	3990	4128			
124	3538	3679	3821	3962	4104	4245			
125	3638	3783	3929	4074	4220	4365			
126	3740	3890	4039	4189	4338	4488			
127	3843	3996	4150	4304	4457	4611			
128	3948	4105	4263	4421	4579	4737			
129	4060	4222	4385	4547	4710	4872			
130									

Table III,—*Apjohn's Hygrometric Tables.*

Degrees of Fahrenheit's Thermometer, and Tension of Vapour in Inches of Mercury.

Ther.	Tension.	Ther.	Tension.	Ther.	Tension.	Ther.	Tension	Ther.	Tension.
°	In. decls.	°	In. decls.	°	In. decls.	°	In. decls.	°	In. decls.
04.0	0.05246	02.0	0.06598	08.0	0.08277	14.0	0.10354	20.0	0.12915
03.9	0.05266	1	0.06623	1	0.08308	1	0.10393	1	0.12962
8	0.05286	2	0.06648	2	0.08340	2	0.10431	2	0.13010
7	0.05307	3	0.06674	3	0.08371	3	0.10470	3	0.13057
6	0.05326	4	0.06699	4	0.08402	4	0.10599	4	0.13105
5	0.05346	5	0.06725	5	0.08434	5	0.10548	5	0.13153
4	0.05367	6	0.06750	6	0.08466	6	0.10587	6	0.13201
3	0.05388	7	0.06776	7	0.08498	7	0.10626	7	0.13249
2	0.05408	8	0.06802	8	0.08529	8	0.10665	8	0.13298
1	0.05429	02.9	0.06828	08.9	0.08561	14.9	0.10705	20·9	0.13347
03.0	0.05450	03.0	0.06853	09.0	0.08594	15.0	0.10745	21.0	0·13395
02.9	0.05471	1	0.06880	1	0.08626	1	0.10784	1	0.13444
8	0.05492	2	0.06906	2	0.08658	2	0.10824	2	0.13494
7	0.05513	3	0.06932	3	0.08691	3	0.10864	3	0.13543
6	0.05535	4	0.06958	4	0.08723	4	0.10905	4	0.13592
5	0.05556	5	0.06985	5	0.08756	5	0.10945	5	0.13642
4	0.05577	6	0.07011	6	0.08789	6	0.10986	6	0.13692
3	0.05599	7	0.07038	7	0.08822	7	0.11026	7	0.13742
2	0.05620	8	0.07065	8	0.08855	8	0.11067	8	0.13792
1	0.05642	03.9	0.07091	09.9	0.08888	15.9	0.11108	21.9	0.13843
02.0	0 05663	04.0	0.07118	10.0	0.08921	16.0	0.11149	22.0	0.13893
01.9	0.05685	1	0.07145	1	0.08955	1	0.11190	1	0.13944
8	0.05707	2	0.07172	2	0.08988	2	0.11232	2	0.13995
7	0.05729	3	0.07200	3	0.09022	3	0.11273	3	0.14046
6	0.05751	4	0.07227	4	0.09056	4	0.11315	4	0.14097
5	0.05773	5	0.07254	5	0.09090	5	0.11357	5	0.14148
4	0.05795	6	0.07282	6	0.09124	6	0.11399	6	0.14200
3	0.05818	7	0.07309	7	0.09158	7	0.11441	7	0.14252
2	0.05840	8	0.07337	8	0.09192	8	0.11483	8	0.14304
1	0.05862	04.9	0.07365	10.9	0.09226	16.9	0.11525	22.9	0.14356
01.0	0.05885	05.0	0.07393	11.0	0.09261	17.0	0.11568	23.0	0.14408
00.9	0.05907	1	0.07421	1	0.09296	1	0.11610	1	0.14460
8	0.05930	2	0.07449	2	0.09330	2	0.11653	2	0.14513
7	0.05952	3	0.07477	3	0.09365	3	0.11696	3	0.14566
6	0.05975	4	0.07505	4	0.09400	4	0.11739	4	0.14619
5	0.05998	5	0.07533	5	0.09435	5	0.11783	5	0.14672
4	0.06021	6	0.07562	6	0.09470	6	0.11826	6	0.14725
3	0.06044	7	0.07590	7	0.09506	7	0.11870	7	0.14779
2	0.06067	8	0.07619	8	0.09541	8	0.11913	8	0.14833
1	0.06091	05.9	0.07648	11.9	0.09577	17.9	0.11957	23.9	0.14887
00.0	0.06114	06.0	0.07677	12.0	0.09612	18.0	0.12001	24.0	0.14941
+.1	0.06137	1	0.07706	1	0.09648	1	0.12046	1	0.14995
2	0.06161	2	0.07735	2	0.09684	2	0.12090	2	0.15050
3	0.06184	3	0.07764	3	0.09721	3	0.12135	3	0.15105
4	0.06208	4	0.07794	4	0.09757	4	0.12179	4	0.15160
5	0.06232	5	0.07823	5	0.09793	5	0.12224	5	0.15215
6	0.06255	6	0 07853	6	0.09830	6	0.12269	6	0.15269
7	0.06279	7	0.07882	7	0.09866	7	0.12314	7	0.15324
8	0.06303	8	0.07912	8	0.09903	8	0.12359	8	0.15380
00.9	0.06327	06.9	0.07942	12.9	0.09940	18.9	0.12405	24.9	0.15436
0.10	0.06352	07.0	0.07972	13.0	0.09977	19.0	0.12450	25.0	0.15492
1	0.06376	1	0.08002	1	0.10014	1	0.12496	1	0.15548
2	0.06400	2	0.08032	2	0.10051	2	0·12542	2	0.15604
3	0.06425	3	0.08062	3	0.10089	3	0.12588	3	0.15661
4	0.06449	4	0.08093	4	0.10126	4	0.12634	4	0.15718
5	0.06474	5	0.08123	5	0.10164	5	0.12680	5	0.15775
6	0.06498	6	0.08154	6	0·10202	6	0.12727	6	0.15832
7	0.06523	7	0.08185	7	0.10240	7	0.12774	7	0.15889
8	0.06548	8	0.08215	8	0.10277	8	0.12820	8	0.15947
01.9	0.06573	07.9	0.08246	13.9	0.10316	19.9	0.12867	25.9	0.16004

TABLE III,—*Apjohn's Hygrometric Tables.—(Continued.)*

Degrees of Farenheit's Thermometer, and Tension of Vapour in Inches of Mercury.

Ther.	Tension.	Ther.	Tension.	Ther.	Tension.	Ther.	Tens	Ther.	Tension.
°		°		°		°		°	
26 0	0 16062	32 0	0 19918	38 0	0 24628	44 0	0 30362	50 0	0 37320
1	0 16120	1	0 19989	1	0 24715	1	0 30467	1	0 37447
2	0 16178	2	0 20061	2	0 24802	2	0 30573	2	0 37576
3	0 16237	3	0 20132	3	0 24889	3	0 30679	3	0 37704
4	0 16296	4	0 20204	4	0 24978	4	0 30785	4	0 37833
5	0 16355	5	0 20276	5	0 25064	5	0 30892	5	0 37962
6	0 16414	6	0 20348	6	0 25152	6	0 30999	6	0 38092
7	0 16473	7	0 20421	7	0 25241	7	0 31107	7	0 38222
8	0 16532	8	0 20494	8	0 25329	8	0 31214	8	0 38352
26 9	0 16592	32 9	0 20567	38 9	0 25418	44 9	0 31322	50 9	0 38483
27 0	0 16652	33 0	0 20640	39 0	0 25508	45 0	0 31431	51 0	0 38614
1	0 16712	1	0 20713	1	0 25597	1	0 31540	1	0 38746
2	0 16772	2	0 20787	2	0 25687	2	0 31649	2	0 38878
3	0 16833	3	0 20861	3	0 25777	3	0 31758	3	0 39011
4	0 16894	4	0 20935	4	0 25868	4	0 31868	4	0 39144
5	0 16954	5	0 21010	5	0 25958	5	0 31978	5	0 39277
6	0 17016	6	0 21084	6	0 26049	6	0 32089	6	0 39411
7	0 17077	7	0 21159	7	0 26141	7	0 32200	7	0 39545
8	0 17138	8	0 21234	8	0 26232	8	0 32311	8	0 39680
27 9	0 17200	33 9	0 21310	39 9	0 26324	45 9	0 32423	51 9	0 39815
28 0	0 17262	34 0	0 21386	40 0	0 26416	46 0	0 32534	52 0	0 39951
1	0 17324	1	0 21462	1	0 26509	1	0 32647	1	0 40087
2	0 17387	2	0 21538	2	0 26602	2	0 32760	2	0 40223
3	0 17449	3	0 21614	3	0 26695	3	0 32873	3	0 40360
4	0 17512	4	0 21691	4	0 26788	4	0 32986	4	0 40497
5	0 17575	5	0 21768	5	0 26882	5	0 33100	5	0 40635
6	0 17638	6	0 21854	6	0 26976	6	0 33214	6	0 40773
7	0 17702	7	0 21923	7	0 27070	7	0 33328	7	0 40911
8	0 17765	8	0 22000	8	0 27165	8	0 33443	8	0 41050
28 9	0 17829	34 9	0 22078	40 9	0 27260	46 9	0 33559	52 9	0 41190
29 0	0 17893	35 0	0 22157	41 0	0 27355	47 0	0 33674	53 0	0 41330
1	0 17957	1	0 22235	1	0 27451	1	0 33790	1	0 41470
2	0 18022	2	0 22314	2	0 27547	2	0 33906	2	0 41611
3	0 18087	3	0 22393	3	0 27643	3	0 34023	3	0 41752
4	0 18151	4	0 22472	4	0 27739	4	0 34140	4	0 41893
5	0 18217	5	0 22552	5	0 27836	5	0 34258	5	0 42035
6	0 18282	6	0 22632	6	0 27933	6	0 34376	6	0 42178
7	0 18348	7	0 22712	7	0 28031	7	0 34494	7	0 42321
8	0 18413	8	0 22792	8	0 28129	8	0 34613	8	0 42464
29 9	0 18480	35 9	0 22873	41 9	0 28227	47 9	0 34731	53 9	0 42608
30 0	0 18546	36 0	0 22953	42 0	0 28325	48 0	0 34851	54 0	0 42753
1	0 18612	1	0 23035	1	0 28424	1	0 34971	1	0 42898
2	0 18679	2	0 23116	2	0 28523	2	0 35091	2	0 43043
3	0 18746	3	0 23198	3	0 28622	3	0 35211	3	0 43188
4	0 18813	4	0 23280	4	0 28722	4	0 35332	4	0 43334
5	0 18880	5	0 23362	5	0 28822	5	0 35453	5	0 43481
6	0 18948	6	0 23444	6	0 28922	6	0 35575	6	0 43628
7	0 19016	7	0 23527	7	0 29023	7	0 35697	7	0 43775
8	0 19084	8	0 23610	8	0 29124	8	0 35820	8	0 43923
30 9	0 19152	36 9	0 23694	42 9	0 29225	48 9	0 35943	54 9	0 44072
31 0	0 19221	37 0	0 23777	43 0	0 29327	49 0	0 36066	55 0	0 44221
1	0 19289	1	0 23861	1	0 29429	1	0 36190	1	0 44370
2	0 19358	2	0 23945	2	0 29531	2	0 36313	2	0 44520
3	0 19427	3	0 24029	3	0 29634	3	0 36438	3	0 44671
4	0 19497	4	0 24114	4	0 29737	4	0 36563	4	0 44821
5	0 19567	5	0 24199	5	0 29840	5	0 36688	5	0 4497
6	0 19637	6	0 24284	6	0 29944	6	0 36814	6	0 4512
7	0 19707	7	0 24370	7	0 30048	7	0 36940	7	0 4527
8	0 19777	8	0 24456	8	0 30152	8	0 37066	8	0 454
31 9	0 19848	37 9	0 24542	43 9	0 30257	49 9	0 37193	55 9	0 41

TABLE III,—*Apjohn's Hygrometric Tables.—(Continued.)*

Degrees of Fahrenheit's Thermometer, and Tension of Vapour in Inches of Mercury.

Ther.	Tension.	Ther.	Tension.	Ther.	Tension.	Ther.	Tension.	Ther.	Tension.
°		°		°					
56.0	0.45736	62.0	0.55881	68.0	0.68072	74.0	0.82671	80.0	1.00094
.1	.0.45890	.1	0.56067	.1	0.68295	.1	0.82937	.1	1.00411
.2	.0.46045	.2	0.56253	.2	0.68518	.2	0.83204	.2	1.00729
.3	.0.46200	.3	0.56440	.3	0.68742	.3	0.83472	.3	1.01048
.4	.0.46355	.4	0.56627	.4	0.68966	.4	0.83740	.4	1.01368
.5	.0.46511	.5	0.56815	.5	0.69191	.5	0.84009	.5	1.01688
.6	.0.46668	.6	0.57003	.6	0.69417	.6	0.84279	.6	1.02010
.7	.0.46825	.7	0.57192	.7	0.69644	.7	0.84550	.7	1.02333
.8	.0.46982	.8	0.57381	.8	0.69871	.8	0.84821	.8	1.02656
56.9	.0.47140	62.9	0.57572	68.9	0.70099	74.9	0.85094	80.9	1.02980
57.0	.0.47299	63.0	0.57762	69.0	0.70328	75.0	0.85367	81.0	1.03306
.1	.0.47458	.1	0.57954	.1	0.70557	.1	0.85640	.1	1.03632
.2	.0.47617	.2	0.58145	.2	0.70787	.2	0.85915	.2	1.03959
.3	.0.47777	.3	0.58338	.3	0.71017	.3	0.86191	.3	1.04287
.4	.0.47937	.4	0.58531	.4	0.71249	.4	0.86467	.4	1.04616
.5	.0.48098	.5	0.58724	.5	0.71481	.5	0.86744	.5	1.04946
.6	.0.48260	.6	0.58918	.6	0.71713	.6	0.87022	.6	1.05277
.7	.0.48422	.7	0.59113	.7	0.71947	.7	0 87301	.7	1.05609
.8	.0.48584	.8	0.59308	.8	0.72181	.8	0.87581	.8	1.05942
57.9	.0.48747	63.9	0.59504	69.9	0.72416	75.9	0.87861	81.9	1.06276
58.0	.0.48911	64.0	0.59701	70.0	0.72651	76.0	0.88143	82.0	1.06611
.1	.0.49075	.1	0.59898	.1	0.72888	.1	0.88425	.1	1.06946
.2	.0.49239	.2	0.60096	.2	0.73125	.2	0.88708	.2	1.07283
.3	.0.49404	.3	0.60295	.3	0.73362	.3	0.88992	.3	1.07621
.4	.0.49570	.4	0.60493	.4	0.73601	.4	0.89276	.4	1.07959
.5	.0.49736	.5	0,60693	.5	0.73840	.5	0.89562	.5	1.08399
.6	.0.49902	.6	0.60893	.6	0.74079	.6	0.89848	.6	1.08640
.7	.0.50070	.7	0.61093	.7	0.74320	.7	0.90135	.7	1.08981
.8	.0.50237	.8	0.61295	.8	0.74561	.8	0.90423	.8	1.09324
58.9	.0.50405	64.9	0.61497	70.9	0.74803	76.9	0.90712	82.9	1.09668
59.0	.0.50574	65.0	0.61700	71.0	0.75046	77.0	0.91001	83.0	1.10012
.1	.0.50743	.1	0.61903	.1	0.75289	.1	0.91292	.1	1.10357
.2	.0.50912	.2	0.62107	.2	0.75533	.2	0.91583	.2	1.10704
.3	.0.51083	.3	0.62311	.3	0.75778	.3	0·91875	.3	1.11052
.4	.0.51253	.4	0.62516	.4	0.76024	.4	0.92168	.4	1.11400
.5	.0.51425	.5	0.62722	.5	0.76270	.5	0.92462	.5	1.11750
.6	.0.51596	.6	0.62928	.6	0.76517	.6	0.92757	.6	1.12100
.7	.0.51769	.7	0.63135	.7	0.76765	.7	0.93053	.7	1.12452
.8	.0.51942	.8	0.63343	.8	0.77013	.8	0.93349	.8	1.12804
59.9	.0.52115	65.9	0.63551	71.9	0.77262	77.9	0.93647	83.9	1.13158
60.0	.0.52289	66.0	0.63760	72.0	0.77572	78.0	0.93945	84.0	1.13512
.1	.0.52463	.1	0.63970	.1	0.77763	.1	0.94244	.1	1.13868
.2	.0.52638	.2	0.64180	.2	0.78015	.2	0.94544	.2	1.14224
.3	.0.52814	.3	0.64390	.3	0.78267	.3	0.94845	.3	1.14582
.4	.0.52990	.4	0.64702	.4	0.78520	.4	0.95146	.4	1.14941
.5	.0.53166	.5	0.64814	.5	0.78774	.5	0.95449	.5	1.15300
.6	.0.53343	.6	0.65026	.6	0.79028	.6	0.95752	.6	1.15661
.7	.0.53521	.7	0.65240	.7	0.79283	.7	0.96057	.7	1·15923
60.8	.0.53699	.8	0.65454	.8	0.79539	.8	0.96362	.8	1.16385
60.9	.0.53878	66.9	0.65668	72.9	0.79796	78.9	0.96668	84.9	1.16749
61.0	.0.54058	67.0	0.65884	73.0	0.80054	79.0	0.96975	85.0	1.17114
.1	.0.54238	.1	0.66099	.1	0.80312	.1	0.97283	.1	1.17480
.2	.0.54418	.2	0.66316	.2	0.80571	.2	0.97592	.2	1.17846
.3	.0.54599	.3	0.66534	.3	0.80831	.3	0.97902	.3	1.18214
.4	.0.54781	.4	0.66751	.4	0.81091	.4	0.98212	.4	1.18583
.5	.0.54963	.5	0.66970	.5	0.81353	.5	0.98523	.5	1.18953
.6	.0.55145	.6	0.67189	.6	0.81615	.6	0.98836	.6	1.19324
.7	.0.55328	.7	0.67409	.7	0.81878	.7	0.99149	.7	1.19696
.8	.0.55512	.8	0.67629	.8	0.82141	.8	0.99463	.8	1.20070
61.9	.0.55697	67.9	0.67850	73.9	0.82406	79.9	0.99778	85.9	1.20444

TABLE III,—*Apjohn's Hygrometric Tables.—(Continued.)*

Degrees of Fahrenheit's Thermometer, and Tension of Vapour in Inches of Mercury.

Ther.	Tension.	Ther.	Tension.	Ther.	Tension,	Ther.	Tension.	Ther.	Tension.
°									
86.0	1 20819	92 0	1 45385	98 0	1 74404	104 0	2 08563	110 0	2 48630
1	1 21196	1	1 45831	1	1 74929	1	2 09180	1	2 49353
2	1 21573	2	1 46277	2	1 75456	2	2 09799	2	2 50078
3	1 21952	3	1 46725	3	1 75984	3	2 10419	3	2 50805
4	1 22331	4	1 47174	4	1 76513	4	2 11041	4	2 51533
5	1 22712	5	1 47624	5	1 77044	5	2 11665	5	2 52363
6	1 23093	6	1 48076	6	1 77577	6	2 12291	6	2 52995
7	1 23476	7	1 48529	7	1 78111	7	2 12918	7	2 53729
8	1 23860	8	1 48983	8	1 78646	8	2 12546	8	2 54465
86 9	1 24245	92 9	1 49438	98 9	1 79182	104 9	2 14177	110 9	2 55202
87 0	1 24631	93 0	1 49895	99 0	1 79721	105 0	2 14809	111 0	2 55942
1	1 25018	1	1 50353	1	1 80260	1	2 15442	1	2 56684
2	1 25407	2	1 50812	2	1 80801	2	2 16078	2	2 57427
3	1 25796	3	1 51272	3	1 81344	3	2 16715	3	2 58173
4	1 26186	4	1 51734	4	1 81888	4	2 17354	4	2 58920
5	1 26578	5	1 52197	5	1 82433	5	2 17994	5	2 59669
6	1 26971	6	1 52661	6	1 82980	6	2 18636	6	2 60421
7	1 27364	7	1 53127	7	1 83529	7	2 19280	7	2 61174
8	1 27759	8	1 53593	8	1 84079	8	2 19926	8	2 61929
87 9	1 28155	93 9	1 54061	99 9	1 84630	105 9	2 20573	111 9	2 62686
88 0	1 28552	94 0	1 54531	100 0	1 85183	106 0	2 21222	112 0	2 63445
1	1 28950	1	1 55002	1	1 85738	1	2 21873	1	2 64206
2	1 29350	2	1 55474	2	1 86294	2	2 22525	2	2 64969
3	1 29751	3	1 55947	3	1 86851	3	2 23179	3	2 65734
4	1 30152	4	1 56422	4	1 87410	4	2 23835	4	2 66501
5	1 30555	5	1 56898	5	1 87970	5	2 24493	5	2 67270
6	1 30959	6	1 57375	6	1 88532	6	2 25152	6	2 68041
7	1 31364	7	1 57853	7	1 89095	7	2 25813	7	2 68814
8	1 31770	8	1 58333	8	1 89660	8	2 26476	8	2 69589
88 9	1 32177	94 9	1 58814	100 9	1 90227	106 9	2 27141	112 9	2 70365
89 0	1 32585	95 0	1 59297	101 0	1 90795	107 0	2 27807	113 0	2 71144
1	1 32995	1	1 59781	1	1 91364	1	2 28475	1	2 71925
2	1 33406	2	1 60266	2	1 91935	2	2 29145	2	2 72708
3	1 33818	3	1 60752	3	1 92508	3	2 29817	3	2 73493
4	1 34231	4	1 61240	4	1 93082	4	2 30490	4	2 74280
5	1 34645	5	1 61729	5	1 93658	5	2 31165	5	2 75069
6	1 35060	6	1 62220	6	1 94235	6	2 31842	6	2 75860
7	1 35477	7	1 62712	7	1 94814	7	2 32521	7	2 76653
8	1 35895	8	1 63205	8	1 95394	8	2 33201	8	2 77448
89 9	1 36313	95 9	1 63700	101 9	1 95976	107 9	2 33883	113 9	2 78245
90 0	1 36733	96 0	1 64195	102 0	1 96560	108 0	2 34567	114 0	2 70944
1	1 37155	1	1 64693	1	1 97145	1	2 35253	1	2 79845
2	1 37577	2	1 65191	2	1 97732	2	2 35941	2	2 80648
3	1 38001	3	1 65691	3	1 98320	3	2 36631	3	2 81453
4	1 38425	4	1 66193	4	1 98909	4	2 37322	4	2 82261
5	1 38851	5	1 66696	5	1 99501	5	2 38015	5	2 83070
6	1 39278	6	1 67200	6	2 00094	6	2 38710	6	2 83882
7	1 39707	7	1 67705	7	2 00688	7	2 39406	7	2 84695
8	1 40136	8	1 68212	8	2 01284	8	2 40105	8	2 85511
9	1 40567	96 9	1 68721	102 9	2 01882	108 9	2 40805	114 9	2 86329
0	1 40999	97 0	1 69230	103 0	2 02482	109 0	2 41507	115 0	2 87148
1	1 41432	1	1 69741	1	2 03083	1	2 42211	1	2 87970
2	1 41867	2	1 70254	2	2 03685	2	2 42917	2	2 88794
3	1 42302	3	1 70768	3	2 04289	3	2 43625	3	2 89621
4	1 42739	4	1 71283	4	2 04895	4	2 44335	4	2 90449
5	1 43177	5	1 71800	5	2 05502	5	2 45046	5	2 91279
6	1 43616	6	1 72318	6	2 06111	6	2 45759	6	2 92111
7	1 44057	7	1 72837	7	2 06772	7	2 46474	7	2 92946
8	1 44498	8	1 73358	8	2 07334	8	2 47192	8	2 93783
91 9	1 44941	97 9	1 73880	103 9	2 07948	109 9	2 47909	115 9	2 94622

TABLE III,—*Apjohn's Hygrometric Tables.—(Continued.)*

Degrees of Fahrenheit's Thermometer, and Tension of Vapour in Inches of Mercury.

Ther.	Tension.	Ther.	Tension.	Ther.	Tension.	Ther.	Tension.	Ther.	Tension.
°	In. decls.	°	In decls.	°	In. decls.	°	In. decls.	°	In. decls.
116.0	2.95462	122.0	3.50003	128.0	4.13290	134.0	4.86758	140.0	5.70735
1	2.96306	1	3.50983	1	4.14425	1	4.87768	1	5.72242
2	2.97131	2	3.51965	2	4.15563	2	4.89081	2	5.73751
3	2.97998	3	3.52950	3	4.16704	3	4.90397	3	5.75264
4	2.98848	4	3.53938	4	4.17847	4	4.91716	4	5.76181
5	2.99699	5	3.54928	5	4.18993	5	4.93039	5	5.78301
6	3.00553	6	3.55920	6	4.20142	6	4.94364	6	5.79824
7	3.01409	7	3.56915	7	4.21294	7	4.95693	7	5.81351
8	3.02267	8	3.57912	8	4.22449	8	4.97025	8	5.82882
116.9	3.03128	122.9	3.58911	128.9	4.23606	134.9	4.98360	140.9	5.84416
117.0	3.03990	123.0	3.59913	129.0	4.24766	135.0	4.99698	141.0	5.85953
1	3.04855	1	3.60918	1	4.25929	1	5.01039	1	5.87494
2	3.05722	2	3.61926	2	4.27095	2	5.02383	2	5.89038
3	3.06591	3	3.62935	3	4.28264	3	5.03731	3	5.90587
4	3.07463	4	3.63947	4	4.29435	4	5.05082	4	5.92138
5	3.08336	5	3.64962	5	4.30609	5	5.06435	5	5.93693
6	3.09212	6	3.65979	6	4.31786	6	5.07792	6	5.95252
7	3.10090	7	3.66999	7	4.32966	7	5.09152	7	5.96814
8	3.10970	8	3.68021	8	4.34149	8	5.10516	8	5.98380
117.9	3.11852	123.9	3.69045	129.9	4.35334	135.9	5.11882	141.9	5.99950
118.0	3.12737	124.0	3.70072	130.0	4.36522	136.0	5.13252	142.0	6.01522
1	3.13624	1	3.71102	1	4.37713	1	5.14625	1	6.03099
2	3.14513	2	3.72134	2	4.38908	2	5.16001	2	6.04079
3	3.15404	3	3.73179	3	4.40105	3	5.17381	3	6.06263
4	3.16297	4	3.74206	4	4.41305	4	5.18764	4	6.07850
5	3.17193	5	3.75247	5	4.42507	5	5.20149	5	6.09441
6	3.18091	6	3.76289	6	4.43713	6	5.21538	6	6.11036
7	3.18992	7	3.77334	7	4.44921	7	5.22931	7	6.12634
8	3.19894	8	3.78382	8	4.46133	8	5.24326	8	6.14236
118.9	3.20799	124.9	3.79431	130.9	4.47347	136.9	5.25725	142.9	6.15841
119.0	3.21706	125.0	3.80484	131.0	4.48564	137.0	5.25127	143.0	6.17450
1	3.22616	1	3.81539	1	4.49784	1	5.25532	1	6.19063
2	3.23527	2	3.82597	2	4.51007	2	5.29941	2	6.20679
3	3.24441	3	3.83658	3	4.52233	3	5.31353	3	6.22299
4	3.25358	4	3.84721	4	4.53462	4	5.32768	4	6.23923
5	3.26276	5	3.85787	5	4.54694	5	5.34187	5	6.25550
6	3.27197	6	3.86855	6	4.55928	6	5.35608	6	6.27181
7	3.28120	7	3.87926	7	4.57166	7	5.37033	7	6.28816
8	3.29046	8	3.88999	8	4.58407	8	5.38462	8	6.30454
119.9	3.29974	125.9	3.90076	131.9	4.59650	137.9	5.39893	143.9	6.32096
120.0	3.30904	126.0	3.91154	132.0	4.60896	138.0	5.41328	144.0	6.33742
1	3.31836	1	3.92236	1	4.62146	1	5.42767	1	6.35391
2	3.32771	2	3.93320	2	4.63399	2	5.44208	2	6.37045
3	3.33708	3	3.94406	3	4.64654	3	5.45653	3	6.38701
4	3.34648	4	3.95496	4	4.65912	4	5.47102	4	6.40362
5	3.35590	5	3.96588	5	4.67174	5	5.48553	5	9.42027
6	3.36534	6	3.97682	6	4.68438	6	5.50008	6	6.43695
7	3.37480	7	3.98780	7	4.69706	7	5.51467	7	6.45366
8	3.38429	8	3.99880	8	4.70976	8	5.52928	8	6.47042
120.9	3.39381	126.9	4.00982	132.9	4.72249	138.9	5.54394	144.9	6.48722
121.0	3.40334	127.0	4.02087	133.0	4.73526	139.0	5.55862	145.0	6.50406
1	3.41290	1	4.03196	1	4.74805	1	5.57334	1	6.52093
2	3.42249	2	4.04306	2	4.76088	2	5.58809	2	6.53785
3	3.43210	3	4.05420	3	4.77373	3	5.60288	3	6.55480
4	3.44173	4	4.06536	4	4.78662	4	5.61770	4	6.57179
5	3.45139	5	4.07655	5	4.79954	5	5.63256	5	6.58878
6	3.46107	6	4.08776	6	4.81248	6	5.64745	6	6.60584
7	3.47077	7	4.09901	7	4.82546	7	5.66237	7	6.62293
8	3.48050	8	4.11028	8	4.83847	8	5.67733	8	6.64007
121.9	3.43025	127.9	4.12157	133.9	4.85151	139.9	5.69232	145.9	6.65725

Geological Map of the MOUNTAIN PROVINCES

BETWEEN THE RIVERS

SUTLUJ AND KALEE

By

CAPTAIN J.D. HERBERT.

Sup.t Mon.l Survey Himalaya Mountains

1826.

Published to accompany Captain Herbert's Report
Journal of the Asiatic Society 1842 VOL. XI. APPENDIX.

A Granite
B Gneiss
C Micaceous Schist
D Chloritic Schist
E Argillaceous Schist
F Limestone
G Hornblende Schist
H Newer Red Sandstone
I Diluvial Beds

REMARKS.

The Straight lines indicate the directions of the Streets. The Arrowheads the quarters of the Trigs. The figures connected the Triangulation

Scale 16 Miles to One Inch

Printed by P.S. D'Rozario & Co.

Geological Map of Captain Herbert's *Himalaya Survey.*

With the present number the Editors of the Journal have the extreme satisfaction of presenting to its readers, and to the scientific world in general, Captain Herbert's Geological Map of his Survey, of which the Report was published by the late Editor and Proprietor, *gratis* to subscribers, as a supplementary number to Vol. XI of the Journal.* The introductory notice to that report will fully explain under what circumstances it was obtained and published. It is to the attentive recommendation of the Government of India, and the ever ready assistance of the Court of Directors, that the Asiatic Society and the scientific world are indebted for this noble proof of what has been done in former days by the Government for the advancement of this branch of science; and if it be considered that the Map and Memoir now date nearly twenty years back, (the Survey was of course previous to it,) and that it is still the only connected geological sketch we have of this great and interesting tract of country, where so many magnificent geological problems yet lie unsolved, and perhaps even unthought of, its importance as a preliminary draft for more detailed and accurate delineation, may, as we have elsewhere stated,† be best appreciated by those who can remember or refer to the geological labours of Smith and the earlier Continental geologists, not many years before its date. We should not also forget that the Report itself was but a *first* one, and therefore, like the Map, but a sketch of what more detailed and minute examination are wanting to render perfect.—Eds.

* A large margin has been purposely made on the left hand margin of the plate, so that it can be taken out of this number, and pasted into the volume, in its place at the end of the Report, by those who have it bound up.

† Proceedings Asiatic Society for March, Report Curator Geological and Mineralogical Departments.

Notes on Moorcroft's Travels in Ladakh, and on Gerard's Account of Kunáwar, including a general description of the latter district. By Lieutenant J. D. CUNNINGHAM, *of the Engineers,* 1843. *Communicated by the Government of India.*

GENERAL ACCOUNT OF KUNAWAR.

Situation, &c.—The Sutlej rises in central Tibet among the ravines of the holy hill of Grangi, and after a north-westerly course of 150 miles, it is enabled to turn at right angles, and to thread its way among the steeps of the Himalayas to the plains of India. The Himalayas are about fifty leagues in breadth, and the upper but smaller half of the basin of the river within them, may be considered as the district of Kunawar. When about to quit Tibet, the Sutlej receives a considerable accession of water from the north-west, but on its way through the mountains, it has no tributary of a greater length than thirty-five miles, and Kunawar may be said to be about seventy miles long by forty and twenty broad at its northern and southern extremities respectively.

The hydrographical basin of the Sutlej no where opens into a broad plain, and Kunawar consists of a series of rocky and precipitous ravines descending rapidly to the bed of the principal river. The greater part of the district lies to the north of the main ridge of the mountains, and the moderate rains which aid in covering their southern and central off-shoots with forests, are unfelt towards the Tibet border. Vegetation thus loses its great encourager, and the natural disintegration of the granite, gneiss, slate and other ancient rocks scarcely anywhere affords a sufficient substratum of soil. Trees which are numerous in Lower Kunawar, disappear towards the north; and where the district bounds with Ladakh and Gáro, scarcely one is to be seen that has not been planted by the hand of man.

Scenery, &c.—The scenery is indeed grand, but its vastness and barrenness in Upper Kunawar are fatiguing. Steep rises above steep, and the lofty summits of the hill, the fancied abode of spirits, are lost in clouds; while far below the broad and foaming river is only distinguishable as a silver-like line. Torrents dash swiftly from rock to rock, turning and writhing in yawning gulphs amid the ruins of

hills, or leaping from high impending cliffs, they are dissipated in spray. So vast indeed are these mountains, and to such heights do they at once attain, that gloomy forests of the tallest pines appear but as grass, and give a colour, rather than a feature, to the precipitous sides. Among the northernmost Himalayas, scenes of such naked grandeur are frequent, but I do not remember any pleasing from their variety, or such as we would term picturesque from their contrasts; and the admirer of *nature adorned*, should not perhaps go beyond Nachár, and certainly not beyond Chiní, where he may revel amid scenes of surpassing luxuriance and beauty.

Culturable Spots.—It used to be an opinion, that the world was at first made as we now find it, and that the channels of rivers were at once created of the depth and breadth we now see them; but geological research has proved, that nature is usually slow in her operations; that the Himalayas may have been raised from the bottom of an ocean; and that the Sutlej certainly was, at a time subsequent to the last great movements, a series of lakes of various sizes. Time has enabled the river to wear away all its impediments, sometimes four hundred feet perpendicular through rock, and it now forms one stream of rapid but equable descent throughout its mountain course. The existence of the lakes in the Sutlej and its tributaries is still attested by horizontal deposits of alluvium at various heights above their present channels, and the beds of these pools still form almost the only cultivated land in Upper Kunawar, for they yield a good soil, and admit of a stream of water from one torrent or another being brought to bear on their inclined and non-terraced surfaces. In Middle and Lower Kunawar, moderate rain and decaying vegetation give more aid to the husbandman, and hanging gardens, vineyards, and fields of many colours add variety and richness to the landscape.

Climate, Seasons, &c.—When the Sutlej turns to cross the Himalayas its channel is about eight thousand five hundred feet above the sea, and in its direct course of seventy miles to the limits of Kunawar, it descends to half that elevation. The villages are usually much higher than this base line, and fields of grain are produced almost two miles and a half above the level of the sea. In Middle Kunawar, the cultivated spots have an average altitude of about seven thousand feet, and it is here in a genial climate, and remote from the heavy rains

of the south, that grapes are produced in abundance. Here during the summer and autumn, the air is cool and the scenery pleasing. The winters too are comparatively mild, and had nature expanded the basis of the Sutlej, so as to allow of plains and brooks, instead of steeps and torrents, the district would have rivalled the most favoured valleys of the Himalayas.

In all countries the spring and summer are welcome, but in this land of snow the reviving vegetation, the tender shoots of each well-known tree, and the coming buds of each simple flower impart to man some of the cheerfulness of the birds which flutter and twitter around him. The scanty and laborious cultivation of each solitary hamlet appears as a gem of price amid the wilderness of hills and rocks, the slight and occasional tinge of green gives a beauty to the desert; it is the evidence of renewed life, and the heart of the peasant expands with joy. He may well remember the season gone by, for in Upper Kunawar and in Tibet, the winter is long and rigorous. Snow may be expected by the middle of November, and it continues to fall until the end of February, accompanied by a strong and piercing wind; the mercury descends below zero, "the air burns frore," and man almost envies the torpidity of the less perfect animals. Hills of snow are heaped high upon hills, range retires far beyond range, and naught relieves the drear and hoary waste or interferes with the awful stillness of the scene, save perhaps a dark and frowning precipice, or the voice of the blue river below, struggling with its fetters of rocks and ice. In contemplating these vast solitudes, illumined by the setting sun, the mind of man is for a moment raised, and he feels and admires their sublimity. He stands majestic, the sole living being on the circumference of a world, but of a world half-formed or in ruin, or not fitted for him. The broad expanse of desolation wearies and appals; the fatal cold and the waning day recal other thoughts, and he turns silent and subdued to seek relief and sympathy among his fellow-mortals, and in the ordinary occupations of life.

In Kunawar, thunder and lightning are rare; but they sometimes occur at short intervals during the summer months. In these lofty regions, however, the flash is dim, and the sound is unheeded by the beasts of the field. Light showers occur in April, June, and September, and sometimes in other months; but they are not sufficient for

the purposes of agriculture. The wind is usually or nearly always from the S. or S. W., and in winter it blows with great violence.

Geology Metals.—Kunawar is an interesting field to the venturous geologist. The accumulation of ages in the dark recesses of a displaced ocean are now in middle air, and their structure, chemical or mechanical, stands revealed in sections, broad, high, and precipitous. The vast extent of the strata in breadth and depth, their tortuousness, their great dip, and their occasional approach to perpendicularity, all declare, that they have been raised from the deep by forces surpassing far the subterraneous efforts of Italy and Iceland; while torrents of molten mineral have been urged with volcanic fury through the heavy and rending bed of the ocean, and now appear as veins of granite and quartz, ramifying from the base towards the summit of mountains of gneiss and slate. The granite is always seen, (and sometimes in large masses which might elsewhere be termed hills,) but it does not constitute the bulk of a mountain, or everywhere compose the crest of a range, as we are usually told of this "first of rocks." The limits of the primeval floods of middle Asia, and the successive geological conditions of the tract are yet to be ascertained, but about the junction of the Petti and Sutlej, the gneiss would seem to yield by degrees to limestone, slate, gypsum and crystalline sandstone, (see also Captain Hutton's Report.) Shining shallows and shingly beaches may here have been found investing some ancient promontory, or forming the coast of an inland sea, for multitudes of ammonites and other shells give proof of organic life and of the means of sustaining it, while abundance of pebbles and rounded rocks, various in size and in kind, scattered about the highest Passes, give some evidence of tidal action.

Veins of copper occur in one place in Kunawar, and some grains of gold have been found in the beds of its streams. There is a lead mine in the adjoining district of Pétti. Other metals are perhaps to be met with, but difficulty of access would render all unproductive as merchandize, save those of the precious or rarer kinds.

Animals.—Kunawar has no animals peculiar to itself. In the lower districts, several of the deer kind are found, including the one which produces musk. Bears and leopards, jackalls, foxes, and horses are not uncommon, and the wolf or gaunt, wild dog occasion-

ally appears in search of food. The feathered tribes are numerous, but the soaring eagle, the Piara of the pheasant kinds, and the king of birds as he is called, need only be particularly mentioned. Numerous flowers enable the industrious bee to lay in a goodly store of honey.

In Upper Kunawar, the animal kingdom is less rich and varied, but the ibex and wild sheep baffle the impatient and wearied sportsman, and the hair of a blueish tinge betokens an arctic climate. The burrowing rat, a few jackalls, and perhaps foxes, an occasional leopard of a pale colour, and the brighter spotted, lynx-like, cat, complete the list of resident animals. Packs of wild dogs sometimes show themselves, but the Këang, or wild ass of the rocky desert, is found only to the northward of the British possessions. The birds are almost confined to crows and ravens, the sparrows, and two beautiful varieties of the red-breast, to pale blue and white pigeons, to the gigantic partridge dwelling near the snow, and the red-legged francoline of delicious flavour. Occasionally, a black plumed eagle may be seem swooping on his prey, a few hawks show themselves, and the ripening crops bring to each village some of the pigeons and doves of India; while the wild-duck is sometimes met winging its way from that country to the lakes of Tibet. A few snakes, lizards, and scorpions almost comprise the reptile kingdom. The insects are more various; but beetles, moths and butterflies, grasshoppers, spiders, and a diminutive gnat or musquito, added to the ubiquitous house fly, the indefatigable ants, and the numerous parasites, need only be alluded to. Of fish it may be said, speaking generally, that there are none in the remotest parts of Kunawar, and yet a few must exist, as an otter is sometimes met with. The mysterious *gangball,* or snow fish, with four short legs and a human face, may be in fact as in description, a fabled animal; but it is talked of, and it is said to dwell only about the limits of the snow. Of domestic animals, it is sufficient to mention the shawl-wool goat, and the yâk or grunting ox. The under-clothing of the goat, however, is much inferior to the "*pushm*" of more northerly tracts, and the hybrid produce of the yâk is of more value, both for transport and the dairy than the genuine animal itself. The people have horses, asses, black cattle, sheep, dogs and cats; but there are no domestic fowls in these districts.

Trees, &c..—In Lower Kunawar, forests of oaks and pines cover the sides of the hills, and various other trees, shrubs and plants are found in every direction; but in the northern parts of the district, spontaneous vegetation almost disappears. An occasional juniper, a few scattered pines, and now and then, in the highest places, a clump of dwarf birches or of the mountain ash, relieve the eye of the traveller. Among the few shrubs, the spreading juniper, and the bush producing a leaf of a tea-like quality, are of most interest. In the adjacent Bhotee districts, these become more rare, and a few poplars and willows, and perhaps a few apricot trees are all that can readily be found, and they shew not the luxuriance of nature but the industry of man. The patches of furze, the scanty grass, a currant, a gooseberry or a rose bush, the broad leaf of either kind of rhubarb, a few hardy creepers, some pleasing flowers and a variety of shrubs and herbs which appear of no value, give a tinge only to the side of the lofty hills—green things, and even flowers, there are many if we begin to ennumerate them, but to man who wants food and shelter and clothing, they all seem profitless, and to the casual observer the barrenness seems entire.

Grains and Fruits.—Most kinds of grain, excepting rice, are cultivated throughout Kunawar. In the north, the varieties of the cockscomb or amaranthus are not found, but every available spot is cut into steps and covered with wheat, barley, peas, beans, buck-wheat, and millet. The millet and buck-wheat are the second crop of a few favoured places, and peas and beans are grown in small quantities as a pleasing addition to the daily food. Here are several kinds of barley, but the beardless variety yields perhaps the best crop. Turnips are sown when the wheat and barley have been reaped, and they are eaten fresh or partially dried, and laid by as store for early winter. A kind of onion is cultivated, and where there are no apricot trees, the people endeavour to raise the surson or mustard plant for the purpose of obtaining oil. Abundance of grapes and apricots, some walnuts, apples and peaches are produced in Upper and Middle Kunawar, and the Chilghoza pine is here met with as a principal tree of the forest. Towards the Tibet frontier the fruits decrease in quantity, and in the adjoining districts of Ladkh and Gáro they disappear altogether. The apricot does not produce at a greater elevation than 10,500 feet, and the grapes are inferior at 9,000.

Race, &c.—The Kunawarees are of the Caucasian race, that is, they are not characterized by the broad features of the Tibetans, and may be of Hindoo origin, as they claim to be; but Brahminism has not yet obtained a mastery among them, and they are more tinged with the manners and religion of Tibet than with those of India. They know little or nothing of their own history, but they are most likely colonists, and they have still among them a separate race regarded as inferior. The people though possessed of some spirit are not warlike, they are peaceful agriculturists, and not a race of robbers. Crimes of great atrocity are rare, nor can it be said, that those which affect property are common. Compared with the people of the plains of India, they may be termed a simple race, without supposing them unimbued with the ordinary evil passions of our nature, as might be inferred from descriptions of some travellers.

Government.—Kunawar is the largest subdivision of the Bìssèhìr principality. The chief is absolute, but here as elsewhere, he must be guided by immemorial usage. The district is managed by hereditary superintendents or viziers, who collect the revenues which are fixed, and levied chiefly in cash, but partly in kind. Each village has its head man responsible for its good behaviour. The lands are divided among a certain number of families, and each house, besides the taxes, provides the Raja with a soldier, and also with a servant or porter when required.

The Bìssèhìr principality had for ages subsisted as independent, carrying on occasional wars with the adjacent states of Kùlù, Ladakh, Chaprang and Garhwál; but it yielded to the Gorkhas, and on the conclusion of our war with the Nepalese, it became a British dependency. It pays to the Indian Government a tribute of rupees 15,000 annually; the revenues of the principality have been recently estimated at 1,40,000 rupees.

Religion.—In northern Kunawar, Buddhistic Lamaism is prevalent, but in the middle and south, the people are left to their local gods, and to the oracular priests of these divinities. Every hill is supposed to be the abode of a *deötá*, who owns the undefined power of some mighty Being above all.

Social relations.—The Kunawarees are all Polyandrists, *i. e.* one house or family has usually but one wife only, and she is considered

as more particularly the wife of the eldest brother. This institution is necessary to limit population, where it is impossible to extend agriculture, where mineral wealth has not been developed, and where the people have scarcely begun to carry on an extensive and profitable trade.

Trade, &c.—The want of organized priesthood, and the institution of Polyandry are the only circumstances connected with the social condition of this people that need be separately mentioned. They are mostly agriculturists, but do not on the whole produce as much as they consume; all have some flocks and herds, and the people of the north have of late become enterprizing traders. They proceed to Leh to buy the drug called *charas,* and to Goro, and almost to the foot of the Karakorum range to procure shawl-wool. For these, they give in exchange money, cloths, and spices, and were the dangerous and difficult roads improved and kept in repair, the Kunawarees might soon become the principal carriers of the trade between middle Tartary and Upper India. At present, the paths are scarcely practicable for loaded mules, and the merchandize is chiefly carried on the backs of sheep and goats. All the people trade in a petty way, for they exchange woollens and fruits for grain and salt.

Food, Clothing, and Houses.—The Kunawarees live chiefly on corn, but meat is occasionally used by those in fair circumstances, and the latter also occasionally indulge in tea procured from Lassa. The people dress in woollens of their own manufacture at all seasons of the year, and towards the north, they add a skeepskin cloak during the winter. The women have a profusion of brass ornaments, and of shell or other beads. The men carry a flint and steel at their waist, and both sexes love to adorn themselves with gaudy flowers, the one most sought after being the French marigold. In the neighbourhood of the forests, their houses are built of wood and stone, and their temples are pretty in themselves, and picturesque in connection with the surrounding scenery. In the extreme north, the scarcity of wood makes the people content with mere hovels of mud and unhewn stone.

Notes on Moorcroft's Travels in Ladakh and on Gerard's account of Kunawar.

Religion of the Kunawarees,—Caste or Race in Kunawar and Tibet.—The religion of the mass of inhabitants (of Kunawar,) is Hin-

dooism, but they have no minute distinctions of caste. They rather burn or bury the dead at some distance from the villages where they erect gravestones; some of them profess the Lama religion, but that properly belongs to the Tartars. The goddess in greatest repute is *Kalee* in her most horrid form, to whom human sacrifices were offered at no distant period. I have heard of their taking place not more than twelve years ago, (1806-10?), and they existed at the famous temple of *Bheema Kalee* at Sooran, where the *Bussehur* Raja resides in summer at a later time, and were not finally abolished until the British Government got possession of the hill states in 1815.—*Gerard, p.* 83-86.

The Kunawarees proper, rich and poor, call themselves *Kauits*, a class which in the hills appears to take rank next to Rajpoots. They consider themselves of Indian origin, but they have no Brahmins among them, and the hopes and fears of the Kunawarees are chiefly placed on their local gods. In Upper Kunawar Bhuddhism has taken deep root, but it has not yet overcome the reverence of the people for the deotas or spirits of the hills. In all Kunawar there are but three temples dedicated to a divinity of the Brahmins. One of these is in the Bhotee district belonging to Bisseher, and is maintained by the Rajah in his frontier fort. The other two are at Ropeh near Sungnam, and at Kotee near Chini on the right bank of the Sutlej. (Captain Gerard, I observe, also places one in his map on the left bank of the river a few miles above Chini). None of these three temples are ministered by Brahmins, nor are human sacrifices offered to the form of *Kali* (*Chundika,*) there worshipped. Sarahan, which contains the temple of *Bheemakali* is not in Kunawar. There are, as I have said, no Brahmins in Kunawar, and Lamaism prevails in the upper-third of the district only. In the other two-thirds the people are without a priesthood, and each village worships one or more equal gods. These districts are under a prince of the Brahminical faith, but such a condition of society offers a fairer field to a Christian Missionary than the plains of India, where he has to encounter an organised priesthood, and the prejudices of a people satisfied with their present chance of salvation.

Caste, or at least distinction of race, is not unknown in Kunawar, and one, if not two separate tribes appear to have escaped Captain

Gerard's observation. These are the Kohlis, Chumars, or Chamangs; and the mechanics subdivided into smiths and carpenters. The Kohlis are so called by the people of the lower hills; in the plains by the people about Rampoor they are called Chumars; and by themselves and by the Kunawarees, Chumangs.

The Kohlis are regarded as out-casts; and no *Kauit* will intermarry with them, or eat with them, or even allow them to cross his threshold. They are in every way a distinct race in Kunawar, and have a language of their own, essentially Hindi, although mixed with some Arabic and Persian terms for which it may be difficult to account. To the southward, their language merges in that of the hill tribes generally. A specimen of their vocabulary is given under the heading "Language." It is not known whether they entered Kunawar as refugees, or have been left in it as a remnant; but they are most likely of the ancient *Sudra* stock of India. Their complexion is usually darker than that of the *Kauits*, and some are said to have woolly hair, as is the case with the tribes of the Vindhya hills.

Family Polyandryism is established among the Kohlis. Some few hold lands directly of the Government, and are otherwise on the same footing as *Kauits*, except that they are the first pressed as porters, a mode of rendering service to the chief usual in the Himalayas. They are commonly labourers and weavers. There are some families of Kohlis in almost every Kunawaree village; but they are not found in the adjoining Bhotee districts. They are the musicians of the villages.

The smiths or lohars are called *domang* in Kunawaree, and the carpenters are termed *oras*. In the eyes of the *Kauits*, they are outcasts equally with the Kohlis, neither do the artisans and Kohlis intermarry or eat with one another. There are two or more families of mechanics in each village. Polyandry is established. The language is the Kunawaree of the district in which they reside. They are pressed as labourers before the *Kauits*.

In the Bhotee districts adjoining Kunawar, the same person is both smith and carpenter, but he is usually styled smith or *loh*. He is regarded as unclean by the Bhotee cultivators, and they do not eat or intermarry with his family. His language is Bhotee, and Polyan-

dryism obtains.—In practice his sons and daughters do not become Lamas and Nuns, but the priesthood is not formally barred against them.

I heard that about Lassa and other considerable places, the potters *(kumhars,)* were regarded as outcasts, and as separate from the artisans.

In Kunawar where wood is plentiful, every one, however poor, is burnt, unless he die of a certain disease called *rimz,* (of the nature of which I made no note, but I remember it was not leprosy.) No one save Lamas have tombs or grave-stones in Kunawar; but the heirs of a man of substance, may, in the Buddist districts, build a temple jointly to his memory and to the glory of an emanation of Sakya.

Tribes—The Kampas, the Zjakpas.—Near our encampment, a Champa or shepherd and his family had encamped, and several other tents were near.—*Moorcroft,* II, 47.

There is a sect of wandering Tartars called Kampa, who are in some respects similar to the Jogees of Hindoosthan. They visit the sacred places, and many of them subsist wholly by begging. Some are very humourous fellows, they put on a mask, &c. &c.—*Gerard, p.* 117.

Now, (1842) the Kampas may be said to resemble the Kotchis of Affghanistan, rather than the Jogees of India, and Gerard's comparison may be particular rather than general. The Kampas are wandering shepherd traders. They are the chief carriers of borax. In winter they graze their flocks in the southern Himalayas, and in summer they proceed to Rohtak, Hanleb, &c. to procure borax and some other articles. They are Tibetans, and intermarry with Bhotees and with Kunawarees, see also Captain Hutton's Tour, (Jour. As. Soc. III, 17.) I am not certain whether the jugglers or maskers of Tibet are Kampas or not, but I think they are. I saw but one party only, and they considered Pitti to be their home, but wandered over a great extent of country.

I may here mention another tribe of men found in Tibet. These are the Zjakpas, a race of mounted plunderers, who infest the country between Leh and Lassa, but whose chief strongholds appear to be in the neighbourhood of the Mansarawar Lake. The Government occasionally finds it advisable to employ these men in the service

of the state, and during the late war with the Sikhs, a band of them accompanied the Lassa force under a leader named Pan Aghim. In Zjakpa we may find the same root as in Kazzak, a robber, and as in Uchakka, a thief.

Tribes—the Kalmaks and the people of Hor.—A considerable portion of the population of Khoten consisted formerly of Kalmak Tartars, but it is said that when the Chinese subjugated the province they deported the Kalmaks to the cities, which collectively constitute the modern city of Ila on the river of the same name, and to the adjacent districts.—*Moorcroft*, I, 381.

The people of Tibet whom I saw always, spoke of the Kalmaks or Sokos as a people dwelling in the countries beyond the Kavakorum range, and whose principal place was 'Eli.'—They described them as of the Gelukpa sect of Lamaism, and said, their present chief was a Lama named Jipchun Tampa, with the title Kaka, (*i. e.* Khakan or Chagan. Tampa may have some relation to the horse, Ta.)

In Sokpo we have no doubt the ancient Sacæ, for *po* is equally with æ, a termination. Our last maps place the Sacæ between Imans and Emodus or in western Tibet, but I doubt whether that country could ever have maintained hordes of horsemen, and the tracts north of Imans are perhaps their original, as they are their present, seats. I have indeed heard of a few Sokpos about Garo, but they are, so far as I could ascertain, emigrants, or the families of a paid soldiery.

The country about Yarkand and Eli, or Ila, is known in western Tibet, under the name of Hor, and the permanent conquest of Ladakh, or frequent inroads into it by these northern tribes, is still preserved in the memories of the Tibetans by the continued exaction of a tax named Hortal or the Hor tax. This tax is levied at the present day in for instance the district of Pitti; but I have not heard that the Chinese Government of Yarkand receives it from Ladakh as the people of Hor did of old; nor was I able to ascertain whether the imposition of the tax in question, was antecedent, or subsequent, to the Kalmak conquest of Ladakh, about the end of the 17th century.

In our maps, we place the mountains of Khor or Hor, and in our geographies, a *Mongol* tribe of the same name, to the north-east of the Mansarawar lake. There can be little doubt of the identity of this tribe of our histories, and of the people now known in Tibet under

the name of Hor, but the well-watered tracts about Yarkand seem better able to rear and to maintain a race of conquerors, than the sterile and rugged district near the heads of the Indus and Burrampooter. The present position of the Hor or Khor race also agrees well with that ascribed to the Chawranei of the ancients, and I think we may presume them to be the same.—*Csoma-de-Koros' Gram.* 6-19-6, identified the Hors with the Turks, and it may be worth enquiry whether Khorassan, Khwarizm, &c. be not connected with this race, and even whether the Gorkhas are not a colony of the same people, notwithstanding their alleged Indian descent. There are such colonies of distant Tartars in the Himalayas, as for instance the Lepchas near Darjeeling.

Religion,—Lamaism.—The Lamas wear red or yellow according to their order. The dress of the grand Lama at Lassa is yellow, but that of the chief Lamas in Ladahk is red.—*Moorcroft,* II, 323.

The religion of Ladakh, like that of Tibet and China, is the worship of Buddha under a peculiar Hierarchy. Every family in which there is more than one son, furnishes a Lama or Gehem, who is at once a Canobite, and a family priest, attached to a monastic institution under a Lama or Abbot, ordinarily living amongst the people, and conducting the rites of their daily worship in their own houses, in which a chamber is usually appropriated to an image and attendant priest. The chief Lamas are appointed from Lassa, and continue to acknowledge the supremacy of the pontiff of that city. They all profess poverty and celibacy, but a man who has been married, is admissible into their order. There are also establishments of religious females called Chumas Anis. The Lamas, Gelums and Anis, or priests, monks, and nuns, are divided into two sects; the red, or old, and new or yellow priesthood.—*Moorcroft,* II, 339-40.

The religion is Lama. The Lamas in Kunawar are of three sects Geeloopa, Dookpa, and Neengma, but I could not hear of that called Shammar by Captain Turner. The Geloopas or Gelookpas are reckoned the highest, since the heads of their religion at Teshoo, Loomboo and Lahassa are of the same sect. They wear yellow cloth garments, and caps of the same of various shapes. The Dookpas are dressed indifferently but have red caps, and the Neengmas wear the same, or go bare-headed; the two former do not marry, but there is no

restriction on the Neengmas. The Lamas admit proselytes at all ages, and any one can become a Dookpa, Geloopa, or Neengma; the chief Gelong of Kamun said he would admit me. There are two other sects peculiar to Chinese Tartary, Sakeea who wear red, and Degooma, yellow caps. In Tibet, the chief of a monastery is called Lama, and the inferior orders are styled Gelong. Here, (Kunawur,) most of the clergy are named Lama, and the heads of the convents of Kamun, Labrung and Shealkur, are denominated Gelong and Geroo. Neither Gelongs nor nuns smoke tobacco, although the Lamas do; neither of them drink spirituous liquors. The Grand Lama of Lahassa, called Gealong Rimboche, who resides at Potala, is the chief pontiff of all the Lamas. The next in succession to the Grand Lama of Lahassa is Panchin Rimboche, of Teshoo Loomboo. The third in order is Lochawa Rimboche, these three personages are all of the Geloopa sect.—*Gerard, p.* 117-21.

(All that Moorcroft and Gerard say, should be read, as well as the above extracts.)

I am imperfectly acquainted with the results of the enquiries of the late Csoma-de-Koros, but we do not, I think, yet possess a full and accurate knowledge of Buddhism as it exists in Tibet, and all our accounts perhaps contain, like the above extracts, some error and confusion. Mr. Hodgson indeed, and others have thrown much light on Buddhism as a speculative religion, but it may be as difficult for us to explain the variety of sects at present existing from the study of Sanscrit or Tibetan books, as it would be for a learned stranger to infer Popery and Protestantism from a simple perusal of our own Scriptures. A complete knowledge of the present sects might enable our scholars to trace in many instances the peculiar tenets of different orders to their sources, and so give us much curious information regarding the progress of error from philosophical refinement to gross superstition; but this knowledge, however desirable, is still to be acquired.

I heard of four principal sects of Lamas, 1st Gelukpá, 2nd Dúkpá, 3rd Ningmá, and 4th Sakhiá, to which may be added the peculiar sects of the Banbos and Pitchobás or Nangbátchos. Turner (Embassy, 314) mentions the Shammars, and says they include all the red sects. The word is, I presume, connected with the Shamanism of the ancients. Gerard alludes to "Deegromas," but of this sect I did not learn,

any thing and neither it, nor three of those I have mentioned are included by Csoma-de-Koros among his nine *principal* sects, (Grammar, p. 175.) Afterwards indeed (p. 194) that scholar says, there are *four* divisions comprehending eighteen sects, and it may be that these *divisions* correspond with Mr. Hodgson's four *systems* of speculative Buddhism. *(Lit. and Rel. of the Buddists, p.* 33.*)*

Notwithstanding its wide diffusion and great authority, I would define Buddhism to be the religion of a priesthood rather than of a people. In the abstract it does not diligently seek for proselytes, and it has but little active interest in the welfare of mankind. Its precepts appear to be silent about reclaiming the unbeliever, and about comforting the lowly and those who pass their days in toil. Its exhortations are towards asceticism, and it insists on a solitary communing with oneself and with God, as the surest road to a happy immortality, or to a speedy incorporation with the deity. This passive excellence produces indeed an indirect effect on the people, who believe their priests to be the chosen of Heaven, and who see that they avoid much of the fraud and violence usual in the world. It is also true, that the people are told of the punishment awaiting evil deeds, but the priest is always more intent on his own salvation than on exhorting the people to be good. He does not consider himself to be a teacher from God, or that *he* should seek to explain to *others* the means of attaining to excellence. The poor are without pastors, and can only be spectators of the religious service of the brotherhood of monks, nor perhaps do the devotions of the rich bring them nearer to God, although they have their private chapels, and attend while the priests offer their supplications to the Almighty. The indifference of the Lamas to the belief or practice of the people is well exhibited in Kunawar; temples erected to the spirits of the hills appear close to Buddhistic monuments, and the priest of a hierarchy share the veneration of the villagers with the creations of ignorance and fancy.

The votaries of Buddhism being taught that in order to attain to divinity, or to a speedy salvation, they must wholly abstract themselves from the affairs of the world; it forms a curious enquiry how this inactive and self-denying system became mixed with other faiths, and took a hold upon the mind of millions. If the persecuted Buddhists entered Tibet, and found a race without a

regular priesthood, the necessity of mixing with others, and the ambition natural to the human mind, may have led the successors of the more enthusiastic anchorites to take advantage of the ignorance of the people, and by degrees to institute a sort of hierarchy; not however, complete or rigorous, for persevering asceticism, or direct inspiration, will even now elevate the poor and the ignorant above the wealthy and the learned. On the other hand, we know but little of the state of Tibet when it was entered by the votaries of Buddha, and they *may* have met with a waning ministry of congenial speculatists. A subsequent union with the missionaries of another faith may have taken place, and may have encouraged the progress towards a regular hierarchy; and if the Nestorian Christians have produced any lasting effects on the belief or practices of Chinese Tartary, the impress will probably be found among the Gelukpa, a sect of Lamas, notwithstanding *their* celibacy, and the allowance of marriage by the Greek church. With the Gelukpas, priestcraft has, I think advanced further than with the others, and they may bear some marks of the training or system brought about by the heresies of the Church, after it had obtained authority and place in the empire. I am, however, very doubtful whether any certain trace of a corrupted Christianity can be found in Tibet itself, and I am not aware that auricular confession, or the worship of relics, obtains in the sense of the eastern and the western Churches.

All the three sects, Gelukpa, Ningma, and Dukpa, with which I have fallen in, insist upon the doctrines of transmigration and of absorption, and maintain a gradation of animals ending in man, through which the soul must pass before its final emancipation. During certain ceremonies, (corrupted ones indeed,) Lamas are seemingly possessed with the divinity. I have seen one who has been considered from his childhood as a "preseus Divus," and the ready faith of the people lays the mind prostrate in either case. All Lamas refuse to take animal life, and some of superior sanctity observe their doctrine, and also refuse to take vegetable life; that is, they will not themselves cut down trees until they wither, or gather fruits or grains until they ripen. Wine is forbidden to all Lamas. Of the three sects abovementioned, celibacy is incumbent on the Gelukpa only, but all practice it who wish to attain to superior sanctity. All Lamas fast in the

Hindoo month Flagon, (February-March,) on the 15th day of the moon. This day is called *nenas;* and the great feast of the general prayers of the Gelukpa sect in the beginning of the year may be connected with it. (Csoma de Koros' Grammar, p. 197). All good Lamas also fast twice in each month, but on these days they may eat raw fruits. The bodies of Lamas are usually burnt, and in general if not always, tombs called *dungkang* are erected over their ashes; but the bodies of priests of great holiness are sometimes cut in pieces, and dispersed on the top of a hill, or the surface of a barren plain, as food for birds; and all sects, who are admitted to be of great purity and excellence, are privileged to eat and drink out of the skulls of those whose bodies have been scattered to the winds, or they may have beads made of portions of the skulls of these good men. (Malte Brun, II, 628, quotes Rubinquis as saying, that in Tibet the people drank out of the skulls of their ancestors; this story may be an exaggeration of the present practice of the holiest Lamas.)

The doctrines and observances above-mentioned, are applicable to all orders of Lamas, so far as I have learnt. I have not fallen in with any of the Sukkias or Banboo, or Pitchoba sects, but I have always heard that the Sakkias greatly resemble the Ningmas. I will now mention some particulars of each class.

Of the Gelukpas, there are six orders: the 1st (or highest) Ghehsheh, 2d Chogzirkpa, 3d Katchin, 4th Gelong, 5th Gichul, and the 6th or lowest, Chunba. The following table shews the lower ranks or orders, and the books they read in villages and provincial establishments before attaining to each:—

Order.	Names of Books.	Subject.	Remarks.
Chunba, ..	Dohna,.. ..	Forms of prayers for procuring blessings..	Do not wear a robe, but a yellow frock, (or chola or chapkan,) a conical yellow cap without lappets, head shaved.
	Sharrah, Ningho Dukar,.. ..	On abstraction and the nothingness of this world.	

Order.	Names of Books.	Subject.	Remarks.
Gichul, ..	Saugdu, ..	Prayers to the five gods to forgive sin.	Vest red, robe or "chader" composed of two cloths, the inside one yellow, the outside one red.
	Zhjikchid, ..	On abstraction as keeping away evil andprolonginglife.	
	Ganbo, ..	Forms of prayers to avert evil, procure advantages, and a general exhortation to holiness,..	Yellow string round the waist, conical yellow cap with short lappets, heads shaved.
	Chargil, ..	Similar to the above.	
Gelong, ..	Lamo, ...	Similar in its contents to Ganbo.	*Cap*, termed Panju, conical with lappets reaching to the breast, yellow cloth or silk lappets,sometimes have *Aummani padme hom* on them. *Under dress*, red.
	Zhjaljiba,. ..	Similar in its contents to Ganbo, on observances and prohibitions. ..	*Robe.*—Consists of two sheets or robes, both yellow, the inside one called *chehgo* of woollen or serge, the outside one called *namber* of silk.
	Dua, (and sometimes) Chamshing, ...	On the necessity of submission to the will of Chamshing, i. e. God.	The Gelongs and superior ranks must always have the *chehgo* or inner robe with them, they must not sleep without it. Both robes are worn as one, right arm free, fastened over the left shoulder, head shaved.
Katchin, ..	Rangtanglú, Chaumadupelu, Gunsumlú and Zintonlú, ..	Subject not ascertained, but I understood that to becomeaKatchin, it was necessary to repeat the four books by heart before the Grand Lama, or the superior of one of the four monasteries near Lassa.	

To become a Gelong, it does not appear necessary that the aspirant should submit to an examination by priests chosen by the Grand Lama, or that they should have been educated at a monastery. Any Gelong can ascertain the acquirements of a person who wishes to be admitted to the rank, and if he is satisfied, the Gichul takes upon himself the dress and functions of a Gelong. This indeed may be the

practice in remote districts rather than near Lassa. Concerning the degree of learning required of a Chogzukpa, I did not inquire: there is only one of that rank in Kunawar, and I did not meet him. I am also equally ignorant of the knowledge required of a Ghehsheh, there is but one in the Chinese districts west of Mansarawar; viz. the *kanbo* or superior of the Teshigang monastery.

The names of the books given in the tabular statement, are those by which they are known in the Teshigang monastery; but the powers of the English letters only give an approximation to the pronunciation of the words. I may not be correct with regard to the contents of the books. My informants, (Gesongs,) though probably as well acquainted as others of that rank usually are in villages, with their holy books, evidently knew but little of them besides the names. I have nevertheless thought it as well to give what I learnt on the subject.

No Gelukpa should use tobacco as a Chimba; he must not take life, and as a Gichul, he must in addition not know woman; these two ranks may be considered as initiatory. A Gelong is a qualified priest, so to speak; most reach that rank, and few get above it.

Of the Ningmas and Dukpas, I procured but little information. They first learn to read and to repeat certain prayers. They then attend in a temple for three years; they never leave the place during that time, nor are allowed to speak to any one save their fellow-students and their teacher. At the end of the three years, they are qualified priests or Lamas, their dress is red. The doctrines of the two sects somewhat differ, and their great Superiors or Incarnations of Sakyamuni are different. They do not cut or shave their hair like the Gelukpas, and marriage is allowed to both sects.

The Sakkias I believe resemble the Ningmas in their doctrines, marriage is not prohibited, they wear a red dress. There are none in Kunawar; but in Pitti there is one temple belonging to them.

The Banbos are a sect of whom I could learn but little; they have no temples, that I could hear of, west of the lakes, but are said to exist in considerable numbers at Kamp, a place about a month's journey N. or N. E. of Lassa. They perform the circuit of Gangri hill and of Mansarawar lake in an opposite direction to that followed by other pilgrims. This at least in the eyes of the vulgar constitute their chief peculiarity. They apparently represent the "Bons," and the

Bonpo faith of the Tibetans before the ascendancy of Buddhism. (Csoma de Koros' Grammar, 177-178). The Sanscrit Bandya, a person entitled to reverence, is, Mr. Hodgson says, the real and significant form of the Chinese Bonze. (Lit. and Rel. p. 40, Note).

The Pitchobas, (or Pitchos and Nangbatchos, or Nangtchos,) are, I apprehend, fakirs or ascetics of different countries and religions, who frequent the great monasteries for the sake of the alms regularly distributed. I sometimes heard they were Mahometans, and sometimes people of China Proper; but *pipa* means any foreigner; *nanga*, (i. e. *nihang*, pure,) means a Hindoo or man of India equally with a Buddhist; while *tcho* is religion, and we thus have foreign religionists or holy men of India and other countries.

The Grand Lamas, or Supreme Pontiffs of the Gelukpa sect, are two in number, and reside at Lassa and Teshi Lonbo. They would seem to be of equal rank, or rather priority of incarnation decides their relative superiority, and the younger becomes the spiritual adviser of the elder. Their functions in the state are perhaps different; the one whose residence is in Lassa may be the temporal lord of the country; while the Lama of Teshi Lonbo, may be the religious superior of the sect; but this point is by no means clear to me. The Lassa Lama is termed Gheawang Rimbotcheh. Gheawa is said to be equivalent to Sakya, and Ghewang to the emanation from, or incarnation or prophet of, Sakya; but the word seems identical with the "*rgyelva*," (the victorious, or a Buddha or emanation,) of Csoma de Koros, (Gram. 148-198,) although it is not understood by the people I have met, as simply equivalent to *rgyelpo* or king. (Tib. Gram. 157.) The power of a termination, however, may be too subtle for the apprehensions of the vulgar. The people understand Rinbotcheh to be expressive of greatness, and Csoma de Koros gives it as equal to precious or holy. (Gram. 191, &c.)

The Teshi Lonbo Lama is called Panchin Rimbocheh. Panchin is no doubt, the Panchhew of Csoma de Koros, (Gram. p. 202,) and both are perhaps the Phanchajnyana, (or he of the five sorts of wisdom) of Hodgson, (Lit. and Rel. p. 40); and whether the application of the term be general or particular, it is not impossible that Presbyter or Pastor John may be a joint corruption of the same words by oriental sectaries and western travellers. The Bhootees have some notion

of the import of Pánchim Rinbotcheh, as they say it means the great one of the five jewels, but these five jewels they conceive to relate to this world only, and to be pearls and coral, gold, silver and copper!

Tesho or Teshi means goodness, and Lonbo, (or Chunpo, Tib. Gram. 198,) is a title of eminence or authority, as the Lé Lonbo or Lonpo, or Lompa, that is, the governor of Leh. (see Moorcroft, I, 334.) Tesho or Teshi, occurs again in Teshigang; *teshi* as before, being goodness, and *gang* equivalent to full of; and perhaps also in the Tassisudon of Turner, Teshi Lonbo is one of the four great monasteries of the Gelukpas. The three others are Dapung and Gaddan (or Galdan respectively, one and two days distant from, and Sehra close to, Lassa, (see Malte Brun. II, 625, for *sera* thence seres, &c.) but the *monastery* appears to be of recent foundation, (A. D. 1417,) Csoma de Koros' Gram. p. 187. Each of the four is ruled over by a Kanho (*Nukanpo* or principal, (Tibetan Gram. p. 198.) Our books and maps give Patala as the great monastery or temple near Lassa, and it has also been considered as the name of a sacred hill, but from the way in which it is mentioned by Purangir Gosayen, (Turner's Embassy, pp. 459, 467,) it seems clear, that the word is only equivalent to *a* monastery or *a* temple, and not that it is the name of a particular establishment or of a holy mountain, or of the residence of the Grand Lama as Csoma de Koros says it is, and further derives its name from the Patala or Tatta of the Greeks, (Gram. p. 198.)

The chief Lamas of the Ningmas, Dukpas, and Sakkias, reside at different places, and pass under different names, but the particulars I ascertained are not so satisfactory to myself as to be worth repeating.

The Gelukpas admit, that Sakya or Sakyatna, (i. e. Sakyat'hubpa, the sage Sakya,) as he is commonly called in the villages, had five principal emanations, or made five great divinities: Sharibu, Meyunghal, Rahjoo, Kung'ghas, and Phakpa Datchumba, or simply Datchumba, (Phakpa is, I believe, equivalent to Nath, in Hindi), but I could learn no particulars. The five may be the same as the creations of the Supreme Buddha, (Hodgson's Lit. and Rel. p. 40,) but from other circumstances I would infer, that among the vulgar, the five divinities mean the middle, and the four quarters, of the world, and are simply expressive of the greatness of the Supreme God.

I must again repeat, that I communicate what I have learnt with some hesitation, and I shall not be greatly surprized if my errors or misapprehensions are frequent and considerable. It is difficult to obtain a complete and accurate description even of ordinary things from the ignorant, and although I spoke with some men of good local repute, it was plain they knew nothing of the philosophy of the system they professed, or of the origin or meaning of the practices they daily followed; much of this may indeed have been my own fault as, for instance, two Lamas in the Hangrang district calculated eclipses, and although suspicious of their ability to do so, I was unable to detect them in mere plagiarism, yet they were ignorant of the lunar cycle, and had the most preposterous notions of the relative sizes and distances of the sun, moon, and planets.

It may nevertheless be gathered from what I have said, that Moorcroft does not fully discriminate between the sects, although he says there are two of them; and that Gerard, while aware of their existence, was not so careful in his enquiries as he might have been. Lama is a general appellation, and does not mean either Gelong, a monk of a particular order, or Abbot, the superior of a monastery. Lama indeed should be confined to men of reputed sanctity, and superiors seldom or never address their inferiors as Lamas, while the lower grades always apply the title to those above them. Celibacy is *not* incumbent on all Lamas, neither are all called "Gelongs," nor are they necessarily attached to a monastery. *Ani*, simply means woman; while *jamo* or *jhomo*, or *chimma*, is the proper equivalent of nun. Mr. Vigne Travels, II, 340, infers a difference between red and yellow Lamas, but Turner appears to confound the individuals of the sects, (Embassy, pp. 86, 103, 170, 242, 250 and 261,) although he tells us of the existence of the two, and of a characteristic difference in their discipline, (p. 314-15).

The Gooroo of Gerard is a Hindu term, while the Labbrang monastery, belonging to the Dukpa sect, cannot have Gelongs or Gelukpas among them. Gerard's description of the dress is not accurate; he has given what he saw on poor Lamas at their every-day work. I have seen a Lama in black.

Lamaism is perhaps extending itself in the Himalayas, and it has within the memory of the Kunawarees progressed some miles down

the Sutlej. It is now as low as Panggi near Chini; its introduction even at Sungram is still remembered; and among a people who practice Polyandrism, and who have no regular priesthood, it is more likely to extend itself than some other religions. In Kunawar there are no Brahmins, and half of the district is without other priests than the oracular ministers of the local divinities.

At p. 118, Captain Gerard says, the Lamas wear necklaces of two sorts of beads, *raksha* and *thu,* the seed of some plant, and that these necklaces contain 108 beads, which is reckoned a sacred number. There are said to be 108 sacred books of the Buddhists, containing all the knowledge which it is desirable to possess, and that the number of the beads is connected with the number of the volumes.

The number is equally important in the eyes of the Hindoos, and with them, as perhaps with the Buddhists, it is the numerical sum of the attributes of the divinity.

Raksha is most likely a corruption of *rudraksh;* at all events it is the same seed or berry, and it is brought from India. The necklace should be composed of the *rudraksh.*

The "beads" in our monkish sense, are commonly of wood, and the string may contain seven or nine, or any odd number, but I am uncertain whether this includes, as in India, the larger middle one. The Kunawaree name of this *sumram* or remembrancer is *lakchikor.*

In the annexed plate is the sentence *Aum Mani Padme Hom,* in the Ranga character, as it appears on the cap of a Gelong bought at Lassa, and also in variations of that character and in the Uchhen, disposed circularly, as I had it written by two Lamas. It will be observed, that this circular form contains the word *shi,* as well as the mystic sentence itself. The Lamas ordinarily know nothing of the import of the formulary, but say it means God, while each syllable is considered as a spell, or as efficacious in averting different kinds of evil.

Emanations—Lotchawa and Kushuk.—The Kushuk Lama presided and was seated above the other priests.—*Moorcroft,* I. 342.

The Lotchawa resides at Teshoo Loomboo, and for many years past he has appeared in Kunawar, he then appeared in Nako, and two children had the same marks by which he is said to be recognized.—*Gerard, p.* 121.

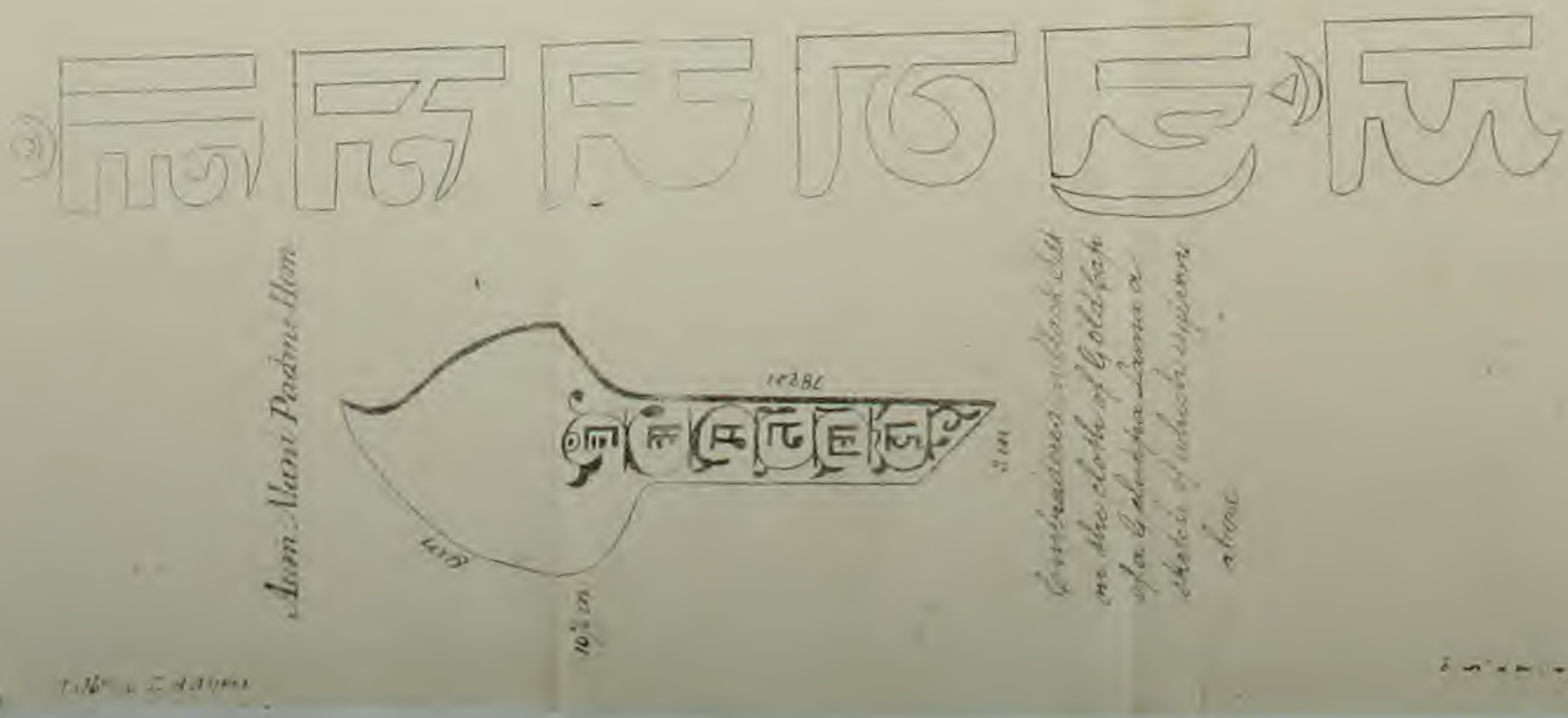
AUM MANI PADME HOM

with in one case the addition of Shi

in the

RANJÁ or LANTSÁ

CHARACTER.



Kashuk or Kushuk means I believe the all-knowing, and is a name usually given to pious Lamas; it may be equivalent to your holiness, in which sense however, Moorcroft hardly uses it. Lotcha has a similar meaning. One of the Lotcha, as mentioned by Gerard is commonly called Kushuk; he is the one finally decided upon as the true Lotchawa, but the other person continues to have respect paid to him by the villagers. The true Lotchawa never rose to the rank of Gelong; but he nevertheless became the reader or household priest of one of the eight *dappans*, or military commanders of Lassa; and who was engaged in the war with the Sikhs in 1841-42. Afterwards, the Lotchawa married, and in consequence lost in reality all his efficacy, although still considered as the vesture of a divinity. While I was in Hangrang, he also committed adultery; but so great is the superstition of the people, that these lapses did not greatly reduce his sanctity in *their* eyes; and I have seen strangers prostrate themselves before him, touch the earth with their foreheads, and crave his blessing, which he bestowed by putting his hand on their uncovered heads.

This same word (Kushuk) appears in Turner, (Embassy, 232-459, &c.), but it is correctly a title and not a proper name.

Religion—Deotas or Local Gods.—The temples of the deotas are magnificent and adorned with a profusion of costly ornaments. There are two or three in every village; each god has generally three distinct houses, one for himself and the third in which he is placed on grand festivals.—*Gerard, at p.* 85-6.

Deotas, or spirits of the hills, are worshipped every where along the Sutlej. These districts fall more particularly within the sphere of my enquiries, but they are no doubt more extensively reverenced; and in the southern Himalayas, the local divinities seem to have been included by the Brahmins in their Pantheon, and changed into Devi, one of the forms of the wife of Siva. This adoption of various superstitions and deifications by an organized and ambitious priesthood has also taken place in India, (see particularly Elphinstone's Hist. I, 179;) but in a portion of Kunawar, the many and equal gods of the first inhabitants, still maintain their ancient but limited sway, not much affected by Buddhism on one side, or Brahminism on the other.

The people, however, have the idea of one great god, or rather perhaps of several divinities, to whom the deotas are subordinate; and

from the 1st to the 15th of the Hindoo month Magh, they are supposed to be absent in the upper sky, soliciting these divinities to confirm or to grant blessings. The people also talk of demons of power greater than the deotas. This system seems to correspond with the present Shamanism of Arctic Asia.

Deotas can reward and punish in this world, but not in the next, or more correctly during this life only; for in Upper Kunawar at least, they have borrowed the Buddhistic transmigration of souls.

Deotas are propitiated by sacrifices, and it is usual for the villagers collectively, to offer a goat or a sheep when the crops appear above ground. When the grain is cut, each house or family makes a similar offering. In some places, an offering is also made at this season of rejoicing on account of the birth, then or previously, of a male child. Offerings are made at any time by individuals to avert a particular evil, or procure a special blessing. The deotas themselves also occasionally desire that a sacrifice may be made through them to the greater gods, to propitiate or appease these higher powers.

The will of a deota is sought and declared by his priest or minister. Fortunate days, as for marriages, are similarly ascertained; and generally, people endeavour to learn whether they will be fortunate or not, by resorting to the priest at the temple, and receiving from him a few grains of wheat or barley. An odd number implies good fortune, an even one, the reverse.

The priest may be of any tribe of the country. In Chini in Kunawar, the present minister is a *chumar* or out-caste. The will of the deota in the selection of his priest is generally ascertained as follows: On a particular day, the period of one of the great Hindoo festivals is preferred, the majority of the villagers bathe, and putting some water only in the drinking cup of the deota, they invoke him in his temple by words and gestures. He who is chosen, is miraculously rapt, or inspired by the god; and taking up the cup he is able to distribute grain from it, (although it contained nothing but water.) The deota may also declare his pleasure in this matter, by imbuing one of his votaries with the power of thrusting unharmed and unmarked, an iron rod through some portion of his flesh. It is the custom in one village I know of to ask the deota from time to time after the death of his priest, whether he wishes a successor to be appointed. The

image is raised upon the shoulders of the people, and if the god presses heavily to the left, he wishes the election to be postponed; if he presses to the right, he wishes that it may take place without delay.

Strictly speaking, the will of the deota can only be ascertained through his priest, but an irregular election is sometimes made, and an opinion forced, as it were, from the reluctant god.

The priest gets the skin and one-fourth of the flesh of the animal sacrificed. After being chosen for the office, he does not give up his daily occupation as a husbandman or mechanic. The priesthood alone would not subsist him.

The deotas are masculine, and the people do not talk of local female divinities; yet in Lower Kunawar, a certain deota, Mansharash, has a wife named Durga, and one of the Hindoo Devis of Kunawar is his sister. The relationship and gender, however, are *Brahminical* innovations, introduced by the people of the neighbourhood doing service about the person of the Raja. The Devi in question is the one at Koti, mentioned under the head of Religion.

In two villages, Kanam and Shasso, of Upper Kunawar, a deota named Dala is worshipped. He is considered as the companion of, or as dwelling with, the Supreme God. No sacrifices are offered to him, and *Lamas* will endeavour to ascertain *his* pleasure by consulting *their* books. In another village Shalkar, of Upper Kunawar, a Lama is supposed to be possessed by a deota on certain occasions, as is related under the head of Festivals. These are instances of *Buddhism* struggling with local superstition.

In Bhotee, the term for deota is Lah. In Kunawar, the same term is used as also Sath and Shu, *i. e.* Shib. In Bhotee, the priest is termed Labdak, and in Kunawaree, Grukchu. The Kunawarees give as the Hindoostanee equivalent *ch'hernawala*, or teazer or trouble-giver.

This system of local gods may be deserving of more research. In Lah, we appear to have not only the equivalent, but the sound of the Roman *Lares*, and of the Arabian *Illah*. The deota has also some features in common with the Grecian oracle. *Lah* is evidently the root of lagang and labrang, the present Tibetan terms for a Buddhist temple, as also of *lapcha*, the only altar the Bhotees continue to raise to their ancient deities. Lah is also a term for a pass in the

mountains, which is still considered as under the care of, and as the place, of the lah or deota, or god.

Temples, &c.—There are many kinds of buildings and temples peculiar to the Lamas, the most common are tumuli, called *mane,* consisting of a dyke of loose stones, and upon their tops, are numerous pieces of slate covered with sentences in the Oochen or sacred character. *Oom mane, &c.* is the most frequent inscription. There is often a pole or two in the middle, and sometimes a flag attached to it.

Chosten or Chokten, is found in the vicinity of every Lama habitation, and on the surrounding heights. It is an enclosure formed of three walls and a roof; inside are one or more buildings of clay, shaped like urns or pyramids of different colours : yellow, light blue and white.

Douktens, are pyramids in steps, with a kind of urn above larger than the chostens ; rarely inclosed, never covered.

Labrang, is applied to two kinds of buildings, one is a square pile of stones six or eight feet high, and one and a half or two feet in diameter. They are erected in the fields to propitiate the deities for an abundant harvest. The other sort is a place of worship of various sizes.

Lagang, is a square flat-roofed house, containing a temple of Mahadeo according to the Kunawarees, but it is called Mahamoonee by the Tartars.

Lapcha—On the tops of many of the houses, are square piles of stones adorned with juniper branches, and on the road sides, are heaps of stones with poles, rags, or flags inscribed with mystic words.

Darchut.—At the corners of almost all the Tartar houses, is a pole to which a flag painted with *Oom Mané pad mee oom* is attached, with a tuft of black yak's hair above.

Cylinders, called *mane,* are common ; they are nothing more than hollow wooden barrels, inside of which are sacred sentences painted on paper or cloth ; they are always turned from the north towards the east. There is a smaller sort with a projecting piece of wood below, these are carried about by the wandering Tartars called *kawpa.*—*Gerard,* p. 123-127.

I do not know what has determined the form of the monuments called mani, and I have but little to add to Captain Gerard's descrip-

AUM MANÍ PADMÉ HÓM

(with Shi inscribed)

in the

UCHHEN CHARACTER

tion. From the centre of the mani, a dungten frequently rises over the ashes of a Lama. The mystic sentence, *Aum Maní padmé hóm*, occurs in varieties of the Oochen and Ranjá characters, and is sometimes disposed circularly with the word shi in the centre. I do not think that the inscriptions usually contain any thing beyond a repetition of the sentence, excepting on each declaring when and by whom the mani was made. As Captain Gerard has observed, the people are careful to leave a mani on their right hand as they pass it.

The chosten or chokten, or choksten, may be considered an altar to the glory of God. They are not always enclosed or covered, and usually consist of a pyramid surmounted by a large urn. They are of three colors: red or yellow, *lonku;* blue or grey, *tulku;* white, *chokú*. It will be observed, that the termination ku is the word for image. Inside the chokten, the Lamas place grain, pieces of metal, formularies or spells, and I have also noticed images in such as were ruinous. The dungkang or dungten is the tomb of a Lama or rather the monument erected over his ashes, or on the spot on which he was burnt. The Gelukpas appear to be the most regular in erecting such tombs. They place in them, formularies and three kinds of grain. They occur by themselves or arise from the centre of a mani, or from either end.—*Moorcroft, II.* 245. Such as I have seen are square and flat-topped, and always of a white colour, but *Moorcroft, II.* 367, when he infers that the "topes" of Afghanistan are tombs, does so, because they resemble the tombs of the Rajahs of Ladakh and great Lamas. What Gerard describes as a dungkang, appears to be a large uncovered chokten, but *Moorcroft* could scarcely be in error.

Labrang means simply a temple containing the image of God, and the one described as a square pile of stones by Gerard, must be a dungten, or Lama's tomb.

Lagang is of precisely the same import as Labrang; viz. the temple of the God.

The lapcha is not Buddhist, it is erected to the spirits of the hills or passes, or on the tops of the houses, and perhaps by the road side; but I do not remember any so situated, except on salient points, where the road turns and descends.—See also Turner's Embassy, p. 197-8.

The darchah is merely a flag or sign, and the word may have the same root as the Hindi dhajjá of similar import. These flags may

also have some connection with the former condition of the people, as marauders and dwellers in tents. The flag surmounted by the long hair of the horse or yak forms the usual standard, and adorns the formidable spear of the Nomade warriors of this age.

The small cylinder called mani is carried by any one thought worthy to do so by the Lamas. Captain Gerard was misinformed regarding the Rampas, (see under that head). I have heard that these cylinders are made to revolve, in order, that motion may be communicated to the contained supplications as it is supposed, and that no prayer can reach God unless an impulse be given to it by the tongue or otherwise. Mani seems to have a meaning in connection with this explanation, but the same term is applied to the fixed pile of stones; it does not seem sufficient, unless indeed it be a custom of the Lamas to beseech the Almighty by encircling the pile, and it appears that the mani at *that time* only, deserves the name.

To recapitulate the *shagri,* (see under that head,) has no connection with any religious faith.

The lapcha or lapchas is in honor of the deities of the hills.

The darchah, lagung, labrang, dungkang, chokten and mani are Buddhistic.

TEMPLES.

Shagris or Piles of Stones or Eminences.—At all the elevated piles, there are a number of square piles of stones called shughar, upon which passengers usually place a piece of quartz, or attach rags to poles which are fixed in the middle. There are also several shugars on the neighbouring heights, sacred to the deotas or spirits of the mountains. The shughars at the passes are erected by travellers, but those on the higher peaks, are commonly made at the expence of some wealthy pilgrim, not much accustomed to the mountains.—Gerard, p. 59.

In this description, two different things seem to be confounded. The shughar, (or rather shagri in Kunawaree, and toyur in Bhotee,) is built by shepherds generally, but by any one, to amuse themselves or to commemorate an exploit. They are usually placed on peaks, or on salient points.

The pile of stones with quartz, rags, &c. is termed lapchas in Kunawaree, and in Bhotee lapcha, and is afterwards referred to by Gerard at p. 126.

Monastaries—Convents.—The religious service of the Lamas, which is performed daily at the gom-pas or temples attached to monasteries.—*Moorcroft,* II, 344.

The Lamas and Gelongs who profess celibacy reside in a monastery, called ghonpa or goomba, and the nuns in a convent called chomoling.—*Gerard, p.* 119.

As Gerard states, gom-pa or gunba is the monastery, and not the temple. Labrang is the word for temple.

Chomoling simply means the nuns sides. Chomo or jomo or zhjomo being "*nun,*" and ling, "*side.*" I have not observed that the convents, so to call them, are separate buildings. Gunba comprehends I think monastery and convents; different parts of the same building being appropriated to each.

Festivals.—The grandest festival (in Kunawar) is called mentiko; it is held in the beginning of September, but I could get no account of its origin. All the people who are able to move, leave their villages and ascend the nearest hill; they proceed slowly making a circuit of several days, and this is the time of the greatest festivity; they adorn themselves with garlands and flowers, and sing and dance to the sounds of music; they run horse and foot races; perform feats of agility, feast and drink.—*Gerard, p.* 81.

In Kunawar, this festival commences on the 19th or 20th of the month Bhador, that is, as Gerard says, early in September, and it usually lasts five days. It takes place after the first crop has been gathered in, and is held in honor of the spirits of the surrounding hills, who are thanked for past blessings and propitiated for the future.

The Bhotees have a similar festival, and it is called by them namgham. It is not, however, the same as that witnessed by Mr. Trebeck. *(Moorcroft, II. 75, &c.)* If the description given by that gentleman is complete, for it was held in August, and had apparently no connection with religion.

As Buddhism has not every where, if any where, superseded the worship of the local divinities, *it* has in part yielded to the superstitions of the people; and at Shalkar, for instance, they suppose that a

certain mountain spirit is an emanation of Shakyamuni, and that he came from Lassa, some generations ago with a Lama of great sanctity. This emanation is called Durjeh Chimno, and is further supposed to be the patron of agriculture. The Lamas endeavour to turn the adoration of the people towards this hill god alone; and in imitation of the deota system, one of their number is supposed to be the chosen priest of the divinity, and on proper occasions is duly rapt or possessed. They do not, however, care to give any emanation of their supreme being a local habitation and an authority with geographical limits, and when the people proceed to a particular pass or eminence to supplicate one lord among many equals, the Lamas take no share in the ceremony.

The greatest festival of the Kunawarees is, that called sherkan by them. It is held on the 10th day of the moon in the month of Asonj, (September-October,) and corresponds with the Hindoo Dasehra.

Polyandry—Marriage.—They (the Ladakhees) have some singular domestic institutions. When an eldest son marries, the property of his father descends to him, and he is charged with the maintenance of his parents. They may continue to live with him if he and his wife please, if not he provides them with a separate dwelling. A younger son is usually made a Lama. Should there be more brothers, and they agree to the arrangement, juniors become inferior husbands to the wife of the elder. All the children, however, are considered as belonging to the head of the family. The young brothers have no authority; they wait upon the elder as his servants, and can be turned out of doors at his pleasure, without its being incumbent on him to provide for them. On the death of the eldest brother, his property, authority and widow, devolve upon his next brother.—*Moorcroft, II.* 321-2.

In this account, there are several things which I did not observe near the junction of the Sutlej and Pitti, and some of the customs are not I think reconcileable to reason or to necessity.

Polyandryism appears to be essential in a country in which the quantity of culturable land is limited, and in which pastures are not extensive; in which there are but few facilities for carrying on commerce, and in which there is no mineral wealth readily made available. This is the case in Tibet, and in many portions of the

Himalayas; and as the people are not of a warlike character, nor of a more ingenious turn of mind than neighbouring races, they have but few resources, and are almost entirely dependent on a scanty and laborious cultivation for their means of subsistence. It is therefore necessary to limit the population, and this is most simply done by allowing one wife only to each house or family. Necessity gives rise to the law, and custom renders it more binding; but a change in the circumstances of the people, produced by whatever means, may render the custom partial in its application. Thus the people of Upper Kunawar, owing to the recent demands for shawl-wool and charas, (a drug,) in India, are now engaged in a rapidly extending carrying trade; they accumulate money; and can maintain themselves in comfort in their villages by importing articles of food. Two or three brothers may thus each become rich, and seek to found a family dependent on trading enterprize, and not on agriculture, for its livelihood.

Polyandrism as I have observed it in Upper Kunawar, and in the neighbouring Bhotee districts, is not exactly the same as described by Moorcroft. The lands of a village are divided unequally among a certain number of houses, and these are assessed in a fixed sum by the state. Each house has usually one wife only, but sometimes two or three. The master or father of the family, that is, the eldest son or brother, retains the authority as long as he retains his faculties, although *his* son may have been married for sometime. On the death of the father, the eldest son, if arrived at manhood, succeeds to the mastership; but if he is a minor, the father's brother succeeds. This I should say is the *rule*, but as the civil relations of the people are not complicated, the right to the mastership has not been very strictly defined, and nephew and uncle, so to speak, act indifferently as superior; the most talented being usually put forward as the representative of the family or house.

If a woman survives her husband, she continues to live with her son; it is her right to do so, and she cannot be put away with a maintenance at his pleasure. A young brother can establish himself separately if he desires to do so; his share of the land and of the moveable property, as also his proportion of the state assessment, being determined by a sort of jury, subject to the approval of the Chief or

Government. I know instances of such a separation, but they are not numerous.

Should a wife prove barren, a second can be chosen, or should she have daughters only, a second can be chosen similarly ; custom allows three or more wives. I know of a man who took a third wife, having been disappointed of a male heir by his first and second. A man also sometimes takes a second wife with the *consent* of the first, although she may have brought him male heirs. Custom allows this, and in practice, a man will take a second or a third wife, if he is disposed to do so, against the consent of his first one; he is amenable to opinion only, and not to a well-defined law strictly administered.

Divorce takes place on the wife committing adultery, or by the mutual consent of the parties.

Chastity is not held in high esteem ; that is, the loss of it is not considered a great disgrace in the eyes of the common people. In the case of an unmarried woman, the man must support her and the child, unless he can arrange for her return to her family by the payment of a sum of money, (from five rupees or so upwards, according to circumstances.) If the woman is a nun, a similar fine is also paid to the temple to which she was attached. A man who commits adultery is fined for the benefit of the state, and he must also maintain the woman, unless he can arrange by the payment of a sum of money for her return to her husband, or to her own family.

I am not aware that the Buddhist books declare aught concerning marriage, or the social relations, and in the absence of a law, the practice of a rude people will necessarily vary.

Marriages usually take place at the age of 15 or 16 ; but one or both parties are sometimes betrothed at an earlier age. Young men and women are left to the exercise of their own choice in a greater degree than is the custom in India, but they are not absolutely free. The usual dower is generally withheld when the girl marries without the consent of her parents, custom requires that the parents of the young man should go three several times to the house of the girl's father, and offer a piece of silk and some wine; if they are accepted a first and a second time, the marriage is understood to be agreeable to the parents of the girl ; and if accepted the third time, the betrothal is complete, and is considered binding. Lamas fix an auspicious day for the mar-

riage, and on the evening previous an entertainment is given in the house of the bride; the Lamas are invited to this feast, they read certain prayers, or at least invoke a blessing on the union, and their presence is also considered necessary at the feast given by the bridegroom's parents after the ceremony.

The above is the custom among the Bhootees. Among the Kunawarees, the practice is similar, but not precisely so, and gradually approximates to that of India. In Lower Kunawar, there are neither Brahmins nor Lamas, but the priests of the spirits of the hills take their place in such ceremonies.

Polyandry—Population—Bastardy.—The women of Ladakh in consequence of their great proportionate number, find it difficult to obtain subsistence.—*Moorcroft*, II, 322.

But the mean (number of inhabitants to a house) in various parts of Kunawar gives six, which will not appear too many, since Polyandry, or a plurality of husbands, prevails.—*Gerard, p.* 3.

Besides this drawback on the increase of population, there is another peculiar to Chinese Tartary and the adjoining countries, that is celibacy, which is professed by numbers of the inhabitants.—*Gerard, p.* 3, *Note.*

Moorcroft's remark does not appear to have been made with his usual discernment. Polyandry cannot affect the proportion of males and females born, and no system of emigration on the part of the men reduces the relative numbers of the sexes. The women have no difficulty in obtaining a subsistence, for they are a robust race; they are equal to most kinds of out-door work, and the care of the fields is chiefly in their hands; socially the condition of unmarried sisters and of younger brothers is the same; both must be maintained by the head of the house, who has a right to their labor.

Family Polyandry should increase the number of souls *per house*, instead of decreasing it as Gerard observes; for besides the husband (eldest brother) and wife and their children, as in a house in Europe, there are, or may be, younger brothers and unmarried sisters; there may be uncles (so to call them) and aunts; there may be more than one wife; and finally, there may be a mother and also a step-mother.

The celibacy of one or more brothers cannot affect the population where family Polyandry is established. Every house has a wife, and

it is only when there are several brothers, that the younger ones become monks. If there is but one son, he will not, (as the rule,) become a Lama, so that the house or family is still maintained; besides which, celibacy is only *enjoined* on one out of the four orders of Lamas which prevail west of the Mansarawar Lake. I took the census of the Hangrang district of Bhotees subject to Bisseher. The total population in 1842 was 760, of whom 373 were males, and 387 were females, an excess of less than four in the hundred. Another census taken less carfully, and in which indeed I had but little reason to place confidence, gave nine more females than males.

Polyandry in spite of the seclusion of the people of the hills and a general simplicity of manners, has a marked effect in increasing bastardy. Of the 760 people of Hangrang, 26 are bastards, which is one in about 29, and as a comparatively few grown-up people only were admitted to be illegitimate, I apprehend there may be more than 26.

In 1835, the population of England and Wales was about 14,750,000, and the number of bastards affiliated, (before the New Poor Law came into operation,) was 65,475, which gives one in about 226; even if the number born should double those affiliated, the proportion would still speak strongly against Polyandry in regard to female purity. (*Wade's British History, p.* 1041 *and* 1055.) It is not clear whether the number of bastards is given for England only, or for England and Wales, but this circumstance would not greatly affect the result.

Gerard, p. 3, estimates the population of Hangrang at 1056. This was upwards of twenty years ago, and although it *may* have been somewhat greater than now, I do not believe it could differ one-third of his total, or one-half of mine.

Characters of the Kunawarees and Bhotees.—Thieves and robbers are unknown (in Kunawar,) and a person's word may be implicitly relied on in any thing regarding money matters. They have not the least distrust or suspicion. (Captain Gerard then quotes two instances, in which a few rupees were advanced to him by Kunawarees.)

The Kunawarees pride themselves on their country, and well know how superior they are to the other mountaineers.—*Gerard, p.* 76-77. I did not like them (the Bhotees) so well at first as the Kunawarees, but they improved on further acquaintance with them

and their language, and I now think them by far the finest race of people in the hills, and much superior to the inhabitants of the plains of India.—*Gerard, p.* 102.

Cheating, lying, and thieving are unknown; they have the nicest notions of honesty of any people in the world.—*Gerard, p.* 106, *see also p.* 108.

That Captain Gerard was not himself robbed, and that his good faith was trusted is not surprising; he was an officer of known rank and position; he was accompanied by agents on the part of the Raja, and a courteous and wealthy stranger is usually welcome among a secluded agricultural people, but had he made more careful inquiries than he seems to have done, he would have found that the Kunawarees can lie, cheat, steal, and commit murder. During the last 15 or 18 years, two men of Kunawar (of proscribed races indeed, *lohars* and *chumars*,) have been hanged, and Kunawarees Proper are almost monthly punished for different crimes by the loss of a hand, or in a less severe manner. Similar remarks apply to the Bhotees. A Bhotee boy very dexterously carried off a powder flask of mine, and half of my servants as well as a more respectable man, the Lahore Vakeel with me, had a mixed metal palmed off upon them as pure gold by various Bhotees. In this metal there was some gold, which was obtained by stealing the books in monasteries and temples, and then burning them for the sake of the gold leaf used in "illuminating" the margins, &c.— *See also Captain Hutton's Tour, III*, 2.—*Jour. As. Soc.*

The Bhotees and Kunawarees have some of the usual virtues of other secluded races, but their evil passions are latent, and only want development. The Bhotees are I think a people without the spirits of men, and like other cowards they are cruel. Still I don't think them beyond redemption, and if their country continues distracted, their energies may be roused. Of the Kunawarees I have a higher opinion. They have some pride of race, due perhaps to their Indian origin, and they have also some intelligence and enterprize, which have latterly been turned towards trade, and a few men in Upper Kunawar are possessed of some wealth.

This trade received a considerable impulse on the emigration of many thousand Cashmere weavers to the plains about 1818 and 1820, and by the late increasing demand in the plains for the *charas* of

Yarkand. The Kunawarees gradually became large carriers of shawl-wool, and of the drug in question; but want of capital obliged many to borrow money, and want of experience in such affairs, with a general ignorance of the world, rendered them no match for the Hindoo *mahajans* of Rampur, and the Cashmeree dealers of Leh, and most of them have in consequence run into debt. Latterly, they have become direct purchasers from the Government farmers and the Yarkand traders, and are emancipating themselves by degrees, while some have realized fortunes so to speak.

This increase of trade has had one bad effect: the profits induced *every one* to become buyers and sellers, and while the better sort borrowed hundreds in Rampur, they lent tens to their poor village neighbours on the mortgage of the produce of their lands. Every village in Upper Kunawar is in debt, and its crops belong as fully to a few monied men as the harvest of India belongs to the bankers of *its* towns.

What Captain Gerard observes at p. 108, regarding the hospitality and liberality of the Tartars, he might have found occasion to alter, had he lived longer among them. He was then at Shipke, a Chinese village, and the people were desirous that he should get into the British territory again as speedily as possible. It is besides the custom to supply the ordinary wants of great men when travelling, that is, to bring a *nazzur* of gram, a sheep, &c. levied by force from the villagers by the local authority. After the first novelty of his appearance or visit had worn off, he would have found, that they could use short weights, adulterate flour, and drive hard bargains in every sense of the word.

In making these remarks, I would not have it inferred, that I consider the Kunawarees and the Tartars as essentially dishonest, or as usually grasping, but simply as not deserving the great commendation bestowed on them.

Employment of the Kunawarees.—The Kunawarees are all traders, and their chief riches consist in large flocks of sheep and goats. In November, many come to Rampur with wool, and a few go to the plains to purchase merchandize for the markets of Garo and Leh, and they likewise visit the fair at Hurdwar; most of them go to Leh or Garoo. In the summer months, the people who stay at home look after their vineyards, and attend to their flocks; the shepherds live in small

houses called *dogree* or *shumung*, where they employ themselves in making butter.—*Gerard, p.* 79-80.

The Kunawarees are rather all agriculturists than all traders, and a strict Polyandry at once implies, that the people have a limited supply of food at home, and scarcely any from abroad. The people of *Lower* Kunawar are not traders in the sense meant by Gerard; even now very few of them go to Garoo and Leh, and their traffic consists in exchanging woollens and fruits, or gram and butter. The flocks of sheep and goats do not furnish much, if any, butter, and the greater portion of that article, used in southern Tibet, is taken across the hills viâ Rampur and other places.

A mere sheep-fold is called *shirnang*, but where a little cultivation is attached to it, the term is *dogree*.

Trade of Kunawar.—Almost all the trade (of Kunawar) is conducted by barter.—*Gerard, p.* 181.

This was more particularly the case when Gerard wrote than at present. The increasing trade in shawl-wool and *charas* render the export of coin necessary, but it is probable that while the opium trade lasted, the value of exports and imports was nearly the same.

The trade in *charas* has arisen, and that in shawl-wool has greatly increased, within the last few years.

The accompanying table will give some information regarding the exports from Tibet to Rampur.

Tabular Statement of the Export Trade of Tibet to Rampur on the Sutlej, during the year 1837-41, *both inclusive.*

Year.	Pashm or Shawl Wool. White. Quantity. Kacha mds. of 16 seers Pakka each.	White. Rate.	White. Value in Rupees.	Black. Quantity. Kacha mds. of 16 seers Pakka each.	Black. Rate.	Black. Value in Rupees.	Wool. Quantity. Kacha mds. of 16 seers Pakka each.	Wool. Rate.	Wool. Value in Rupees.	Borax, (crude.) Quantity. Kacha mds. of 16 seers Pakka each.	Borax, (crude.) Rate.	Borax, (crude.) Value in Rupees.	Charas. Quantity. Kacha mds. of 16 seers Pakka each.	Charas. Rate.	Charas. Value in Rupees.	Miscellaneous. Estimated value in Rupees.	Total Value. Rupees.	Remarks.
1837	1185	3¼ Rs. per 2 Batti or 2 seers Pakka.	33180	175	1¼ Rs. per 2 Batti or 2 seers Pakka.	2450	1092	8 seers Kacha per Rupee.	5460	394	13¼ seers Kacha per Rupee.	1189	215	6¼ Rs. per 2 Batti or 2 srs. Pakka.	10750	2500	55529	Of the miscellaneous articles no detailed statements have been furnished and are not perhaps procurable. They include Ponies, prob. value 500 Rs. Pashmina, coarse, 325 ,, Woollens, coarse, 400 ,, Silks, China, 250 ,, Tea, ... 350 ,, Salt, ... 200 ,, Gold, ... 350 ,, Chowries, .. 100 ,, to which may be added zedoary, coarse Russia leather, sulphur, coral, felts, orpiment, and badian khatai, (an aromatic,) but in small quantities. Only a few moreover of the miscellaneous articles are regularly brought for sale and all in variable quantities. A large quantity of salt, and a considerable number of sheep and goats are annually sold in Rampur; but the salt is procured, and the sheep and goats are bred, in the hills of the Punjab.
1838	1481	4 do.	47392	190	2 do.	3040	784	8 srs. do.	3920	566	16 seers ditto,	1415	236	4½ do.	8496	2500	66763	
1839	1463	6 do	70224	119	3 do.	2856	787	8 srs. do.	3935	678	15 seers ditto,	1808	241	5¼ do.	10122	2500	91445	
1840	1400	8 do.	89600	151	4 do.	4832	1570	7 srs. do.	8971	505	13 srs. 6 cks. do.	1510	57	5¼ do.	2394	2500	109807	
1841	200	10½ do.	16800	23	5¼ do.	966	58	6 srs. do.	387	22	13 srs. 6 cks. do.	66	16	7½ do.	960	500	19679	

Charas, coarse Russia leather, coral, felts, badian khatai, and an inferior pashm of short staple, are brought from Yarkand.
The best pashm wool, woollens, ponies, gold, salt, orpiment and nearly all the borax from the Chinese districts of Garo and Rohtak.
Inferior pashm, some borax, sulphur, and coarse pashminas from Ladakh.
Tea and silks from Lassa.
Zedoary from Nepal; and chowries from Tibet generally.

REVENUES OF PITTI.

Statistics of a Bhotee Village.—The whole revenue of Pitti is collected in grain, by a measure called *khal,* equal to eight pakka seers, and of the value of thirteen annas. The revenue is levied upon but 267 houses, the total will be 2,937 *khals,* or in value 2,386 rupees.—*Moorcroft, II,* p. 70-71.

"Estimated" should perhaps have been used by Mr. Trebeck instead of "*collected,*" see also *Gerard p.* 147. In 1841-42, there were in Pitti about 250 *paying* houses, and of that number, the revenues of fifty-two or fifty-three were appropriated to the five monasteries of the district, agreeably to an arrangement made by Lassa on the transfer of Pitti to Ladakh, (see *Chanthan,* history of.) The sum demanded from the 197 or 198 houses was 398 rupees, and about 30 pieces of woollen. This tax is denominated *mattal;* besides the above, the Rajah of Ladakh levied from all Pitti a tax named *Hortal,* and a second *mattal,* amounting to 36 and 18 rupees respectively. *Hortal* means the tax of *Hor,* the country about Yarkand. *Mattal* means the real or principal or original tax. *Mah* being the same as *mul* in Hindee. I am unable to explain the application of the term to the small tax of rupees 18.

The Rajah of Ladakh further demands a quantity of iron, cotton goods, paper, madder, &c. from the whole of the district, for which he gives 50 rupees, taking however 200 rupees' worth of goods.

Besides the revenues appropriated to the monasteries, the division of Pitti, called Pin, pays to the Abbot of Teshingang on the Indus, a quantity of grain. The Abbot also sends a quantity of tea to the houses or families of the valley, for which he asks and gets double price. Teshigang belongs to the Chinese.

This same division Pin, pays to Bisséhir, a British dependency, 32 pieces of woollen and one sheep; the sheep and two of the pieces of cloth being the perquisite of the Bisséhir authorities sent to collect the tax.

Kulu, (a Lahore dependency,) demands from the whole of Pitti including the houses attached to monasteries, one *ju* or *jao* of gold, equal to 8 or 9 rupees, and also 4 pieces of woollen.

As my statement of the revenues differs greatly from the estimate of Mr. Trebeck, I may be wrong; that is, my informants may have purposely misled me. From what I have seen however of these parts, I incline to the smaller sums as the more probable one. In Pitti and the adjoining districts, I would say that eight seers of wheat are now worth eight annas, instead of thirteen, and that eight seers of barley are worth five or six annas only.

The various claims on the people of Pitti are a good specimen of the complicated relations of the different districts along the Snowy Range, notwithstanding the approximation of the large and consolidated empires of England and China.

I annex a table exhibiting the number of people, and the agricultural means of Changgo on the Pitti river; together with some other particulars which may be curious, if not of much value. Changgo produces somewhat more grain than it consumes, and several of its inhabitants are traders. The village is in Hangrang, the Bhotee district subject to Bisséhir.

With reference to the Hangrang district, I may here say, that instead of five spots, and some narrow strips capable of cultivation, as Gerard says, p. 15, there are seven separate villages, one temple with lands attached, and at least three detached pieces of land belonging to one or other of the villages.

Statistics of Chánggo in Hangrang on the Pittí River, a Bhotee district subject to Bisséhir.

	No. of Houses.	Males above 12.	Females ditto.	Males under 12.	Females ditto.	Man Servant.	Maid ditto.	Bullocks.	Zhos, male hybrids.	Yaks.	Cows.	Zomos, female hybrids.	Sheep and Goats.	'Ploughs' of Land.	Asses.	'Ploughs' of Land.	Remarks.
Houses which pay Revenue.	1	1	2	2	1	1	0	0	0	0	1	0	0	0	0	2½	*Annual Demands of Government.*
	2	3	1	1	1	0	1	0	0	0	1	0	3	0	0	2½	Rupees, ... 35
	3	3	1	1	3	1	1	0	1	1	1	0	15	1	0	4	Karraktis, coarse woollens, ... 144 hats
	4	2	3	2	0	0	0	0	0	1	1	0	4	0	0	2	Pakkis-fine woollens, ... 1 piece
	5	2	2	0	0	0	1	1	0	1	2	0	5	0	0	3	
	6	3	1	1	2	0	1	1	1	1	1	0	13	1	0	2	
	7	2	1	1	1	0	1	1	2	0	2	0	4	0	0	1⅛	*Productions of the Village.*
	8	3	2	1	3	1	6	2	3	2	3	1	21	3	3	7	*Fruits.*—Apricots.
	9	1	1	3	1	1	1	1	1	1	3	0	14	1	1	3	*Vegetables.*—Turnips, Onions.
	10	2	1	3	2	0	0	0	1	0	1	0	8	0	0	2	*Principal Grains, &c.*—
	11	1	1	0	0	0	1	0	1	2	2	0	15	0	0	3½	Wheat, barley, jammar, and lona (kinds of barley) chineh, chastang(beans,) dao or fabra, and perhaps occasionally some others.
	12	2	1	0	0	0	1	1	1	0	2	0	3	0	0	2½	
	13	3	2	1	0	0	1	1	0	0	2	0	4	0	0	3	
	14	2	1	0	0	1	1	1	1	0	2	0	11	0	0	3	
	15	2	1	0	3	0	0	1	2	0	2	0	12	0	0	3½	
	16	2	2	2	0	0	1	0	0	0	1	0	3	0	0	3½	
		34	23	18	17	5	17	10	14	9	27	1	135	6	4	48½	*Note.*—A few stalks of oats, *péá*, in Kunawaree, and *Kassam* in Bhotee, are found in every field, but the grain is nowhere cultivated.
Non-paying Houses.	1	2	2	0	1	0	0										Illegitimate,..... 7
	2	2	2	2	1	0	0										4 Males, ... { 1 Man. 3 Boys.
	3	1	2	0	0	0	0										3 Females, ... Girls.
	4	1	1	1	0	0	0										
Lohar	1	2	2	0	1	0	0										Lamas, ... 16 } Ningmas, Nuns, (none,) } a red sect.
Grand Total.		42	32	21	20	5	17	10	14	9	27	1	135	6	4	48½	
		137 Souls.															
		68 Males, 69 Fems.															

Pitti Authorities.

The house belonged to the *taoche*, or head of the carriers, and he with Khaza Khan, the manager of the district, and the *paon* or scribe, paid me every civility in the absence of the chief of Pitti, Sultan Beg, whom I had left at Leh.—*Moorcroft, II.* 60.

The *taoche*, or *togotcheh*, or *dogotcheh*, is simply the deputy of the resident manager of the Pitti district; he is however particularly charged with the collection of the revenue under the *karrpan* or *griot*, chief or manager; and he also collects the porters and beasts of burden for the use of the Rajah, and proceeds in person with them if many are required.

Khaza Khan was the father of the present *karrpan*, or manager of Pitti; he was a Buddhist and not a Mahometan as might be supposed, if we looked upon Khan with our Indian experience only; his real name was Teshi (or Tashi) Dandup.

Paon is not known as the word for scribe in Pitti or its neighbourhood, but the individual alluded to by Mr. Trebeck, is still remembered as a skilful carver, &c. He was the eldest son of Khaza Khan, above-mentioned. The Bhotee for scribe is *dunghi*.

Sultan Begh was of a family of Shia Mahometans settled near Leh; his grand-daughter or great-grand-daughter married Gholam Khan, subsequently made chief of Pitti, an active partisan of the Sikhs; and who was put to death by the Chinese after their victory in December 1841, near the Mansarawar Lake.

Food.—All classes of Tibetans eat three meals a day: the first consists of tea; the second of tea or of meal porridge, if that cannot be afforded; the third of meat, rice, vegetables and bread by the upper, and soup porridge and bread by the lower classes. The Tibetans never drink plain water if they can afford it; the poorer drink a beverage called *chang*.—*Moorcroft, II*, 328-331.

The food of the people (of Kunawar) is bannocks of different kinds of grain, kitchen vegetables, and a great proportion of meat; their most usual drink is tea, and they occasionally take a dram of spirituous liquor, and at their festivals they indulge pretty freely.—*Gerard, p.* 77.

The food of the people, (*i. e.* of the Hangrang Bhotees,) is almost wholly flesh, for even a part of the little grain produced is exported, and most of the rest made into an intoxicating liquor named *chong*. They take their dram of spirits in the cold mornings.—*Gerard, p.* 113-114. Flesh of all kinds forms the principal part of the food of the Ladakhees.—*Gerard, p.* 154.

I think the above observations are applicable only to the better classes, and not to the poor people; that is, to nearly all the people.

Indeed a family of the better sort in Kunawar will only kill a sheep or a goat once in a month. In the adjoining Bhotee districts, the people may do so once in 18 or 20 days, their flocks being larger and more easily fed. Tea is not regularly drunk by more than ten families in all Kunawar; some drink it occasionally, some rarely, and some perhaps never. *Chong* is drunk by the poor people on particular occasions only; but there are dissipated people every where, and some men may take a dram every morning. Grain is too valuable to admit of its consumption in the manufacture of spirits.

I think that the poorer people in Upper Kunawar and in Tibet, live chiefly on the meal of parched grain mixed with water. They don't often or regularly bake cakes, although those in better circumstances may frequently do so. In times of scarcity, they eat chestnuts in Lower Kunawar, and in Upper Kunawar and the adjoining districts, they use apricot kernels; that is, if they have them, for apricots do not bear at a greater elevation than 10,500 feet.

Drink of the Kunawarees—Sore Eyes.—For although the Kunawarees can get nothing but snow for some months in the year, they are not so subject to *goitre* as the people that live in the damp grounds. In winter, the eyes are frequently inflamed by the reflection of the snow, and the people travelling at this time, protect them with large leaves, generally of the rhubarb.—*Gerard, p.* 82.

It may be safely said, that the Kunawarees are never reduced to drink snow water for more than a few days in a year, and a few small villages only are necessitated to do that; every village is near a stream or spring, and both streams and springs flow in winter, notwithstanding snow and frost.

The rhubarb is not green in winter, and if it had leaves at that season, they could not easily be got at; being buried at great heights under snow. Hair spectacles, juniper twigs, &c. are used to protect the eyes.

Customs as to Food.—The present did not include some hares, for no other reason as far as I could learn, than that the length of their ears assimilated them to asses.—*Moorcroft, I,* 424-5.

The Bhotees do not eat hares, nor birds of any kind, nor fish. Towards our borders, however, they are somewhat lax; but towards Rohtak, our hill traders are good humouredly reviled, when they eat the fish of the lakes of that neighbourhood.

I did not learn the origin of these customs, but they may be the result of an effort of Buddhism, to spare life in whatever shape it appears.

Scarcity of Grain—The Potatoe.—The crops (in Kunawar) for the most part are poor, and a great want of grain pervades the whole country. In times of scarcity, horse chestnuts, after being steeped for two or three days to take away their bitterness, are dried and ground into flour, and apricots and walnuts also form part of the food of the people.—*Gerard, p.* 64-5.

I have seen wheat flour as cheap as sixty pounds for a rupee, but the average price in Kunawar is from thirty to forty, and in October and November, it is scarcely to be procured for any money.—*Gerard, p.* 65.

Kunawar has a few villages which produce more grain than their inhabitants require, but considered as a whole, the district imports a portion of its food. The people never willingly part with their grain, and during my residence in Upper Kunawar and the adjacent Bhotee districts, I got it compulsorily at the rate of $8\frac{1}{2}$ and 10 seers, (17 and 20 lbs.) the rupee, and what I required for the few people with me, was sometimes brought from a distance of 60 miles.

Scarcities are occasioned by a want of rain in April, but sometimes by a destructive insect which eats the stalk. I heard also that about 25 years ago, (1817-18,) a flight of locusts appeared. The kernels of apricot stones, treated the same way as Gerard says of horse chestnuts, are likewise used to economize grain, and the people dig up roots, and make use of the wild pea named *charek,* which I have met with in Hangrang.

Gerard laments (p. 65,) that the potatoe was not so extensive by cultivated as it ought to be, considering that his brother had at different times distributed upwards of 2,000 lbs. weight of that vegetable among the people. It is now scarcely if at all cultivated, and the reason may be simple; as a first crop, it is not so productive as gram, and as a second it cannot perhaps be matured.

Tea.—The next article of importance in the trade of Ladakh, is tea brought in square masses or lumps, packed (in Lassa) in the raw skins of yaks, the hair inwards. Each block called *dom* by the Kashmiris, and Ponkah by the Lassans, weighs about 4 Delhi seers, less

than 8 lbs. avoirdupois; the green sold wholesale at three rupees per seer, and the black at less than two rupees, and the retail price is nearly double.—*Moorcroft, II,* 350-1.

There are three kinds of tea brought from Lassa, called severally *zangcha, chungchu and kopinjeh.* The former two may be called black teas, the *kopinjeh* green. At the Garo fair, a block of the black may be bought for six rupees, and of the green for 18 rupees.—*See also Mr. Vigne's Travels, II,* 345.

Chadam is the name given to the block in Ladakh; and about Garo, *parka* is I heard the Lassan name, and *ponkah* may be a misprint.

Chabbas—Tea Merchants.—In the course of October, a caravan of *chabbas,* as they are called, traders from Lassa, arrived with many yaks laden with tea.—*Moorcroft, II,* 252.

Chabbas means literally tea-ees, *i. e.* tea merchants, *cha* or *zhja* being the Bhotee for tea. The caravan arrives annually from Lassa, returning however the next year; and the investment is chiefly the property of the principal men in the place, *i. e.* in this case of the public authorities. An officer of the Government, called *jung-chung,* comes in charge of the caravan. I have heard that about a lac and a half of rupees worth, Leh price, was formerly required annually for the Cashmir market, but that of late, the Sikh authorities in Ladakh, in emulation of the functionaries of Lassa, monopolized the trade; so as in the first instance, to diminish the consumption of the article, and afterwards the value of the trade in it.

Bisséhir Tea.—It appeared that a considerable importation of a vegetable product used as tea, took place from the British dependency of Bisahar. According to information obtained from two intelligent natives of that province, the tea of Bisahar is of two kinds, green and black. The green grows in greatest abundance about Jaghul, between Rampur and Sarai, (Sarahan).—*Moorcroft, II,* 352.

I understand that the Bisahar tea was produced chiefly about Lippa, that of Jukhul being a greenish variety. The tea or bush is called *pangcha.* The leaves are exposed in the sun for two days. They are then mixed with a gum called *changta* or *jatta,* which oozes from a tree called *trin* found near Lippa. This, it is said, is done to give it a colour. The bark of a tree called *sangcha,* (found about Rampur,) is used instead of cinnamon.

The Bissehir tea is drank by those who cannot procure Chinese tea, or it is mixed with the superior kind. At Garo when Chinese tea is scarce, that of Bissehir will sell for three seers *katcha* (or 2 lbs. good) the Rupee.

Bissehir Cups.—Each man has his own cup, either of China porcelain, or which is more common, made out of the knot of the horse chestnut, edged or lined with silver, or plain. About five thousand of these are annually exported from Bissehir to Gardokh, and sold at the rate of six for the rupee.—*Moorcroft, I,* 329-30.

Inferior cups only are made of the chestnut; they are also made of the apricot tree and of other woods, but the best kinds are made of the knot or excrescence of a tree called in Kunawar, *kauzal,* and about Rampur, *láör.* The cup itself is called *puriveh.*—*Gerard, p.* 1812, calls the vessels *porwa,* and says, they are made of juniper wood, but on this point he is certainly mistaken, if he means that they are made of the juniper only.

Pashm Tus.—Although the fleece of the sheep affords a material similar to that of the goat, it is not in sufficient proportion, nor of adequate length, to be considered fit for the manufacture of shawls. Besides the fleece of the domesticated goat, that of the wild goat under the denomination of *asali tus* is exported in smaller quantities to Kashmir.—*Moorcroft, I,* 348-9.

The dogs are of a large ferocious breed; they are covered with black wool.—*Gerard, p.* 73.

Of the shawl-wool of the sheep I could never learn, or at least learn of it as an article of trade. It may exist in nature, and yet I apprehend that such animals only as have coats of hair are provided with an under-coating of what deserves to be called shawl-wool.—Thus the dogs of Tibet which are covered with black hair, and not wool as Gerard perhaps inadvertently says, have an under-coating of inferior shawl-wool.

Asali tus is a Kashmiree, *i. e.* Persian or rather Arabic, expression, for the wool of the wild goat. *Tusi* means simply a kind of brown color. In the Punjab *tusi* is applied to any kind of broad cloths retaining the natural color of the wool, which may be called *tus. Pat* is the term given to the wool of the goats of Afghanistan and Turkistan, and the cloth made from it is called *pattu;* similarly, *barak* is

the name given to the cloth made of the wool of the camel of Central Asia.

The cloth made of the wool of wild goat of Tibet, which I have seen, had always a strong smell.

Gold.—The province (Chanthan) also produces gold in considerable quantities, but the search after it is discouraged by local superstition, and by the Chinese authorities.—*Moorcroft, II,* 364.

The search for gold seems to be discouraged by a tax only, for the local superstition simply says, that pieces of extraordinary size belong to the genii of the spot, and should not be removed. The gold is found deep in the ground, and the well-sinkers all come from Lassa, and are employed chiefly by merchants of that place. The tax on each pit or well, or party of diggers, is a *sirrjao* or *jao* of gold, the *jao* weighing about $7\frac{1}{2}$ mashas, and being worth about 8 rupees on the spot, and about 9 rupees in Rampur.

The tax is collected by a special authority named the *sirrpan*, or gold manager.

Sirr appears to be the term for gold throughout Central Asia and in Tibet; as in Persia it is the root of the term for yellow.

Natural Tinder.—At first I used a flint and match paper, but I afterwards exchanged it for the flower of a plant that grows near the snow.—*Gerard, p.* 110.

The plant is called *bachow-chi,* that is bachow-grass. It grows at low levels as well as near the snow. The tinder is called *bacha* in Kunawar, and *kufri* towards Rampur, and is the leaf not the flower of the plant. There are three plants similar in kind which produce this tinder.

Animals—Wool—Hybrids.—There are some white bears, and hogs, hares, and deer of many sorts are plentiful; there is one species of deer called *sar* that seems to be the wild goat. There are animals about the size of a dog called *chungkoo* and *mangsa,* the former are white, the latter are red. The common and musk deer.—*Gerard, p.* 74.

The birds are pheasants, hawks, eagles, crows, kites, pigeons, and *chukors.* The most beautiful bird I have seen in the hills is named *peeara,* the natives call it the king of the birds. Fish are not abundant, and I have seen only one kind.—*Gerard, p.* 75.

I never saw the bears mentioned by Gerard, but I have usually heard them described as of a reddish colour, with a white crescent on the breast. The ordinary deer, the musk deer, and that termed *sar*, are not found in Upper Kunawar. *Chanku* is the Bhotee, and *mangsa* the Kunawaree term for the wild dog; the animals are therefore one and the same, (*see also Captain Hutton, II,* 16, *Jour. As. Soc.*) In Upper Kunawar, they are said to be of a brownish or reddish color, and are but seldom seen. They are considered as coming from the neighbourhood of the Indus, and it is natural that their chief haunts should lie near the large flocks of sheep and goats kept between Garo and Rohtak.

The ordinary wild animals in Upper Kunawar are the hare, the jackall, (and perhaps the fox,) the wild sheep, (*war* male, and *namo* female,) the wild goat or ibex, (*kin* male, and *danmo* female,) the leopard and the leopard-cat. The wild sheep subsists chiefly on grass, and the wild goat as much as it can on the leaves and tender branches of trees and shrubs; it prefers the mountain ash. Of the wild goats there are not many, and they are difficult to get at with a gun. The wild sheep is more accessible. The bear is not to be found beyond the limits of the forest, but the grapes of the villages near the junction of the Sutlej and Pitti, attract it towards the fall of the year. A few others are to be met with in some of the ravines. I have not noticed the rat alluded to by Gerard, but its existence in particular localities has been also well ascertained by others. The wild ass ranges about the Churnoril lake, and towards the sources of the Sutlej.

The gigantic *chakor* is frequently met with in Upper Kunawar, but it keeps close to the snow. The ordinary *chakors* are found in great numbers, but they retreat to the heights during the breeding season. During the harvest, pigeons appear from the southward, but a few of a particular kind with light plumage remain throughout the year. The common dove of India, and a small sparrow appear in the summer, and also a few eagles; but crows of different kinds and several varieties of small birds are more numerous about the villages in the winter than at another period.

In Upper Kunawar, large fish are only to be met with in the Sutlej, considerably below its junction with the Pitti. A few of the size of minnows may be found in pools, and perhaps in the smaller streams.

The ordinary domestic animals are ponies, asses, a few mules, ordinary hill bulls, yaks, sheep, and goats. To these may be added dogs and cats. The ponies are small but hardy; a better kind comes from the valley of the Indus, and a better still from beyond the Karakorum range. The asses are small. The yaks are as numerous as the common black cattle of the lower hills, but they are chiefly imported; and the most valuable animals for draught and dairy produce are the male and female hybrids of the yak and cow. There is nothing peculiar to a casual observer in the ordinary sheep and goats; but the sheep of the highlands near the Indus on either side is not uncommon, and is famous for its long silky wool. The Government agency (about 1820) failed, however, to bring this wool to Kotghar, (six marches above Simlah,) at such a price as to render it a profitable export to England. For this there may be two reasons: 1st, the dirty state of the wool; and 2nd, the very large prices necessarily given, by suddenly increasing *ad libitum*, the demand for the article. Captain Gerard himself confirms this, when he says, (p. 19,) the Kunawarees found it more profitable to take their wool to Rampur (or Kotghar) than to Gurhwal, *see also Captain Hutton's Tour, II,* 12, *Journal Asiatic Society.* The *pashm* of the goat of this quarter (Hangrang, &c.) is short and inferior. The dogs are of the kind known as the Tibet mastiff, but somewhat smaller. The cat does not appear to differ from the domestic animal of India.

I annex a statement of the hybrids common in Upper Kunawar and the adjacent Bhotee districts:—

Yak—Cow.	Bull—Zomo.		Yak—Zomo.	
Zho (male), *Superior for carriage.*	Zomo (female.) *Milk better and more abundant than that of the common Cow.*	Trolpo, (male.) *Good for carriage, but slow.*	Trolmeh, (female.) *Milk equal to that of the common Cow.*	Gano. (male.) *Die in a year or two. I add this as indirectly corroborative of the incapacity of Hybrids to continue their mixed race.*	Gareh. (female.)
		Bull—Trolmeh.			
			Produce scarcely distinguishable from that of the common Bull and Cow.		

The female of the yak is called *brimo* in Kunawaree, and *dimo* in Bhotee. It is not used for hybrid produce, and as it is said not to live in Upper Kunawar, very few are to be seen.

Yarkand Ass.—Yarkand Mare. *Hill Ass.—Hill Mare.*

Ghĕáreh. Deh.

Bring from 160 to 200 Rs. in Garo. Worth about 50 Rs. in Garo.

The female in either case superior to the male.

The mules are chiefly purchased by the Lassa traders. It is not considered proper by the Tibetans of Lassa to breed mules, and if by chance one is born among their herds, some purifying ceremonies are gone through by the owner.

The subjoined table shows the ordinary price of animals of a fair quality in Upper Kunawar, together with the loads they usually carry:—

Animals.	*Price.*	*Load.*
Ram, ...	3 0	16 to 20lbs.
He-Goat, ...	4 5	16 to 20lbs.
Ass,....	10 16	64lbs.
Mule, ...	50 80	128lbs.
Poney, ...	50 60	128lbs.
Zho, ...	16 17	128lbs.

A man carries 64lbs. as a fair average burden.

Wild Animals—The Ass.—In these elevated regions wild horses, *keang*; asses, *goorkhar*; and yaks, *dong*; besides innumerable hares and deer, are plentiful.—*Gerard, p.* 117.

The *keang* is, I think, the only animal of the kind found along the Upper Indus, or indeed in Tibet generally, and it is an ass, not a horse. *Turner* (204-5) and *Moorcroft,* (*II,* 295 *and* 443,) evidently saw but one animal, notwithstanding the different designations used by the latter in his account of his journey in 1812. The descriptions given by Moorcroft seem to be accurate, excepting that the tail is terminated by a tuft of long hair, and that there is one stripe only along the back, and none across the shoulders. I procured two skins of the *keang*, and sent them to Dr. Jameson, Officiating Superintendent of the Botanical Gardens at Seharanpore.

There are wild yaks north and east of Garo, but none in the districts visited by Captain Gerard, and I doubt the existence of deer, properly so called, and of the numbers innumerable of wild goats and sheep, which do however exist in small herds in these parts.

To be continued.

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Notes on Moorcroft's Travels in Ladakh, and on Gerard's Account of Kunáwar, including a general description of the latter district. By Lieutenant J. D. CUNNINGHAM, *of the Engineers,* 1843.

[Concluded from page 222.]

LANGUAGE.

There are five different dialects spoken in Kunáwar, the words are monosyllabic or dissyllabic.

1*st.* The Milchan, or common ; the chief characteristics are the terminations *ang*, *ing*, *ung*.

The infinitives of the verbs end in *mig* and *nig*.

2*nd.* The Theburskud spoken at Soongnum, is very different from the Milchán, and the infinitives terminate in *hung* and *pung*.

3*rd.* The dialect used in Lubrung and Kannur, in which the infinitives of verbs end in *ma* and *na*.

4*th.* That spoken at Leedung, where the terminations of the infinitives are *ens*.

5*th.* The Bhoteea or Tartar.

The Milchan and Bhoteea are distinct tongues, and the same may be almost said of the Theburskud ; the other two are dialects of the

Milchán, and differ principally in the tenses of verbs and cases of nouns.—*Gerard, p.* 87, 88.

Captain Gerard might have added a sixth language or dialect; viz. that of the Kohlis or Chumars, noticed under the head of Religion and Caste. This differs as much from the Kunawaree, as that does from the Bhotee.

The different dialects of Kunawar show how various the speech of a rude people may be; and the localities of each kind of infinitive may prove, that the tract of country was occupied by one race in the first instance, and that in the three fertile, but secluded valleys of the N.E., a difference of speech arose. Láppá, Kanám and Sungnam are the principal places in these valleys, and each has its own tongue, the two former differing chiefly in the modifications of the nouns and verbs, while the dialect of Sungnam owes much to the neighbouring language of Tibet. Shássò, however, is in the same valley as Sungnam and near to it, and as the Kanám dialect prevails there, a comparatively recent migration to that place may be inferred.

In what is now called Upper Kunáwar, there are five villages on the left bank of the Sutlej, half of the inhabitants of four of which are Bhotees, while of the fifth, all are of that race. The Bhotees have also a village on the right bank in what is called Kunáwar Proper, (*i. e.* six instead of seven in all, as Gerard says, p. 101,) and I think it likely that they formerly occupied the Sutlej valley as low down as Cíhní, but gave way before the Kunawarees.

This would explain the Bhotee derivatives of the Upper Kunáwar dialects.

Milchán is the Rampur term for the common Kunawaree; in that language the term is Milchanang. I would say that the infinitives end in *mih'* and *nih'*, rather than in *mig* and *nig*.

Theburskud, or correctly Tibberkad, is also called Sungnam-pá-kad, but is frequently applied to all the dialects differing from the common. *Kad*, not *skad*, is a Kunawaree term for speech, language.

The infinitives of the Lidung or Lippa verbs, I would write as *ent* or *enh'*, rather than *ens*.

The annexed table gives a specimen of the dialects of Kunawar, (including those of the Bhotees and Kohlis,) while the note appended

*

to it shows their different localities. I add to this a specimen of the infinitives of verbs:—

English,—*To speak.*

Common Kunawaree,.....Lonhmih',
Lippa dialect, ...Lōdenh', or lodent,
Kánam ditto, ...Logmá,
Sungnam ditto, ...Lopang,
Bhotee,.....Zarchá,

Comparative Table of Words of Kunawar and the adjoining Bhotee Districts, (see also Mr. Hodgson's Literature and Religion of the Buddhists.)

English.	KUNAWAREE.			*Bhotee* of Pitti, Hangrang, Rungchung, &c.
	Milchâng, or common.	*Tibberkad*, or particular, when it differs from the common as specified.	*Chamangee*, or that of the Kohlis or Chumars.	
The World, .	Dúníá, ...	... ..	Dúníá, *or*.. .. .. Dés zjameh ínsá, *that is*, ... *Dés, jameh insán.*	Mímang.
God, ...	Isar, ...	....	'Ishar, Mahadeo, ..	Kontcho.
Man, ...	Mí, ...	....	Mánúsh,..	Mí.
Woman,..	Chasmí, Cháchatch, *a young woman*, ...	.. ....	Dëin, ...	Najúng.
Quadruped, .	Poshú, ...	Seantchan S.	Saktamtchúk,.. ..	Semtchan.
Bird, ..	Píá, ... Píátch, *a small bird*,	.. ..	Choreh, or chóreh, chotúng, ..	Jía.
Insect,	Yúng, *winged*, Ong, *not winged*,	....	Makí, kír, patung,	Downg, *winged*. Bú, *not winged*.
Worm,.. ..	Káhong,..	....	Kahong, kírá,.. ..	
Fire, ...	Meh, ...	....	Ag, ...	Meh.
Air, ...	Lán, ...	....	Bághur, ...	Lungpo.
Earth,.. ..	Matang,..	....	Mátí, ...	Sá.
Water,.. ..	Tí, ...	....	Pání, ...	Chú.

Note.—In Kunáwar there are three principal dialects. 1st. The Milchánang or ordinary dialect, which prevails chiefly in Lower Kunáwar, and on the left bank of the Sutlej in Upper Kunawar. 2nd. The Tibberkad, which is applied chiefly to that of Sungnam and the adjacent villages, Taling and Rushklang, but which includes, 1st, the dialect of Kanam of Labrang and Pílo, lower down on the same stream, and of Shásso in the Sungnam valley; 2nd, the dialect of Lippá of Asrang above, and of Janghí and Akpá below Lippá; the 3rd dialect is that of the Chumárs or Kohlis, a separate race.

In this Table S. signifies Sungnam, K. Kánam, and L. Lippa.

The *g* is always hard, and *ch* is always sounded as in choose, or as *tch* in thatch.

KUNAWAREE.

English.	*Milchâng*, or common.	*Tibberkad*, or particular, when it differs from the common as specified.	*Chamangee*, or that of the Kohlis or Chumars.	*Bhotee* of Pitti, Hangrang, Rungchung,&c.
Sun,..	Yuneh, nih, ..	....	Dews, dewz, ..	Nímá.
Moon, ...	Goltchang, ..	....	Zot, zjot, ...	Dowá.
Stars, ...	Kar, ...	Karmá, L. K. S.	Táreh, táro, ..	Karmá.
Mountain, ..	Dokang, ...	Dungkang, LKS.	Donk,..	Dák.
River, ...	Samundrang, ..	....	....	Sangpo.
Father, ...	Bábá, ...	Apá, L. K. S.	Bábá, ...	Aqú.
Mother, ...	Amá, ...	....	Amá, ...	Má.
Grandfather,	Tehteh, mehmeh,	....	Tehteh, ...	Mehmeh.
Grandmother,	Tehgo, apí, ..	....	Owh-aí, ...	Abí.
Child, ...	Chang, chanh, ..	....	Cheldo, ...	
Boy,..	Chongchang, ..	Pomlangchang, L. K. .. .. ; Poshri chang, S.	Púshú, cheldo, *i.e. male child,*	Túgú.
Girl,..	Chihchang, chimeh, ..	Chameh, L.K. S.	Dëin, cheldo, *i.e. female child,*	Búmo.
Uncle(father's brother,) ..	Gato, Bábá, ..	Chípa, L. K. S.	Bábá, ...	Aqú, chungga.
Aunt, ...	Náneh, ...	Aneh, L. K. S.	Mama, kant chúain, ..	Majúng.
Summer,.. ..	Rángdëaro, *that is warm season.*	Rabang dëáro, L. K. S.	Zaow or Rzaow-radëáro, *i. e. hot season,* ..	Chatpá.
Winter, ..	Liaskú dearo *i. e. cold season*	Katídearo, LKS.	Shelo-ra dearo, *cold season,* ..	Dangmo.
Grain, ...	Choa, ...	Brú, L. K. S. ..	Náj, ...	Dú.
Rice, ...	Ral-ralh, ...	....	Rhowl, ...	D.
Wheat, ...	Zot Rozat, ...	....	Ghëow, *Nasal*,..	Dó.
Barley, ...	Takh, ...	Ta, L. K. Zat S.	Zho *or* zhaw, ..	Söa.
Marriage, ..	Tem, ...	Samchá, L. Namsha, K. S.	Zjanetch, ranekh,	Bangma.
Birth of man or animals,	Zarmíänmí, ..	ZarmíänmaLKS.	Zoramnow, ...	Kehj.
Death, ...	Groh, ...	....	Groh, ...	
House, ...	Kim, kewm, ..	....	Ghor, ...	Kangba.
Stone, ...	Rak, ...	Ráh, L. K. Galhing, S.	Zani, zan, ...	Döa.
Brick, ...	It, ...	....	....	Pow (*unburnt brick.*)
Temple, ...	Labrang, ...	....	Labrang, thákúr choárá,	Labrang.
Image, ...	Múrat, ...	Kúndá, L. K. S.	Kunda, múk'h,..	Kú.
Bridge, ..	Cham, jampa, *of wood*, tran torang, *of rope*,..	Jampa *of wood* tran torang, *of rope*, ..	Sanggo, zangcham, zhotto,	Jampa *of wood* chazam *of rope or chain.*
Tree, ...	Bhotang, ...	....	Bhot, ...	Pang.
Leaf, ...	Patlang, patílang	....	Patrang, pateh,	Loma.
Flower, ...	Ú, ...	Ments, L. K. S.	Phúl, ...	Mendo.
Fruit, ...	Phalang, ...	P'hal, L. K. S.	Phol, ...	Dhïábo.
Horse, ...	Rang, ...	Shang, L. K. S.	Ghoro, ...	Tá.
Bull, ...	Dammas, ...	Ehtong, L. K. S.	Dám, ...	Lánggú, or langgu.
Cow, ...	Lang, ...	Rad, L. K. bahang, S. ..	Ghorú, ghow,..	Ba.
Buffalo, ...	Mosh, moësh, ..	....	Moysh, ...	Maheh.
Dog, ...	Kwí, ...	Kaoi, ...	K...., ...	Kí.
Cat, ...	Píshi, ...	Pishi, L. K. *S*...	Pishí, ...	Pushú.
Jackal, ...	Shálík, ...	Gánuk, ...	Shalti	Hazeh, hajeh.

KUNAWAREE.

English.	*Milcháng*, or common.	*Tibberkad*, or particular, when it differs from the common as specified.	*Chamangee*, or that of the Kohlis or Chumars.	*Bhotee* of Pitti, Hangrang Rungchung,&c.
Sister, ...	Rings, shing, ..	....	Boen, *(nasal,)*..	Shingmo.
Brother,.. ..	Bháïá, ...	Beteh, L. K. S.	Bhaí,(ahteh,*eldest brother*,)	No.
Own Family,..	Pehrang, ...	....	Perí tabar, or tabar kabila,	Jingkang.
Kinsfolk, ..	Ang, pehrang, ..	....	....	Narang, grea.
Strange folk,..	Hehdeh, pardesí,	....	....	Miyulna.
The Head, ..	Bal,....	Pisha, L. K. S.	Mútkan, múnd,..	Go.
Hair, ...	Karra, ...	....	Bal, ...	Ta.
Face, ...	Toh, ...	Mamih, L. K. S.	Rú, ...	Gondong.
Eye, ...	Mík, ...	Mih, L. K. S..	Akhí, *(nasal,)*..	Mik, mih.
Nose, ...	Takus, ...	Murh, L. K. S..	Nak, ...	Na.
Mouth, ...	Kaggang, ...	Aqat, L. K. ah, S.	Kahk,..	Ka.
Chin, ...	Chipkang, ...	Oskeo, L. K. S..	Choth, ...	
Ear, ...	Kanang, ...	Rippang, L. K.S.	Kánh,..	Namjok.
Forehead, ..	Piah, ...	....	Níral, ...	Piai.
Boy, ...	Déhang, aprang,	....	Deh, ...	Jukpo.
Arm, ...	Gúdh, ...	....	Hath, ...	Lakpá,
Leg, ...	Bang, ...	....	Kúndí, ...	Kangbá.
Right,.. ..	Zahong, ...	....	Dhákhná, ...	Yáfá.
Left, ...	Dehlang, ...	....	Bhäon, ...	Yanpa.
Month, ..	Gol, ...	Lá, L. K. S. ..	Másáro, máswáro,	Dah.
Year, ...	Borshang, ...	Boshang, L. K.S.	Boras, borash, ..	Lo.
Day, ...	Dáir, ...	....	Diár, ...	Júh or juk.
Night, ..	Ratting, ...	Gungá, L. K. S.	Rat, rateh,.. ..	Ghanmo.
One, ...	Id, ...	Tíh, S.	Ek.	Chík.
Two, ...	Nish, ...	Nïshí, S.	Döi, ...	Ní.
Three, ..	Sum, ...	Hum, L. K.....	Tron, ...	Súm.
Four, ...	Pú, ...	Púï, L. K. pi, S.	Chár, ...	Zjí.
Five, ...	Guá, Gnáí, ...	Gnáú, S.	Pánch, ...	Gná, *(nasal.)*
Six, ...	Tuk, ...	Túh, L. K. tuggí, S. ..	Choh, ...	Dúk.
Seven, ..	Tísh, ...	Sníish, L. K. nashl S.	Sáth, ...	Dún.
Eight, ..	Rháï, ...	Gheh, L. K. ghái, S. ..	Ath,..	Ghent.
Nine, ...	Gúï, guí, ...	Gú, L. K... ..	Now, *(nasal,)*..	Gú.
Ten, ...	Sáï, ...	Sá, L. K. Chúï S.	Dos, ...	Chú.
Eleven, ..	Síhí, ...	Sáï, L.K. chútï S	....	Chúkshík.
Twelve, ..	Soníish, ...	Sanash, L. K. chuní, S. ..	.. ..	Chúní.
Thirteen, ..	Sorúm, ...	Sahom, L. K. chopsúm, S. ..	.. ..	Chuksum.
Fourteen, ..	Sápú, ...	Chopí, S.	....	Chubjí.
Fifteen, ..	Songhá, ...	Sanghá, L. K. chowang, S. ..	.. ..	Chonggó.
Sixteen, ..	Sorúkh, ...	Satú, L. K. chúrú, S.	.. ..	Chúrú.
Seventeen, ..	Sastísh, ...	Sastish, L. K. chubdan, S.	.. ..	Chúbdán.
Eighteen, ..	Sáraï, ...	Sarget, L. K. chobgent, S.	.. ..	Chúbghent.
Nineteen, ..	Sasgur, ...	Ságú, L. K. chúrgú, S.	.. ..	Chúrgú.
Twenty, ..	Nízá, ...	Nisá, ...	Bís, ...	Níshú.
Thirty, ..	Dëorníšá, ...	....	....	Sumchú.

KUNAWAREE.

English.	*Milcháng*, or Common.	*Tibberkad*, or particular, when it differs from the common as specified.	*Chamangee*, or that of the Kohlis or Chumars.	*Bhotee* of Pitti Hangrang, Rungchung, &c.
Forty, ...	Nínísá, ...	Nishnisa, S.	....	Zjipchú.
Fifty, ...	Dhaïnísá, ...	....	Do-b s-o-dos, ..	Gnápchú.
One hundred, .	R'há, ghëá, ...	....	Ra panch bis, ..	Ghëá.
One thousand, .	Hazar, ...	....	Haz r, ...	Tong.
Ten thousand, .	Sáï hazár, ...	....	. .. .	Tongchú.
One hundred thousand, ..	Lák'h, ...	....	....	Búm.
One million, ..	Sáï lák'h, ...	....	....	Búmchú.
Monday, ..	Suárang, ...	....	....	Dowa.
Tuesday, ..	Manglarang, ...	....	....	Míngmar.
Wednesday, ..	Búdárang, ...	....	....	Lakpá.
Thursday, ..	Brespatí, ...	....	....	Púrbú.
Friday, ..	Shúkárang, ...	....	....	Paksang.
Saturday, ..	Saníshras, ...	....	....	Penpa.
Sunday, ..	Etwárang, ...	....	....	Nímá.
Jan., (Magh,)	Mahang, ...	....	... .	Dowachungnibá
Feb., (Fagun,)	Fauang, ...	....	....	Dowa, dúngbo.
March, (Cheit)	Chetrang, ...	....	....	Dowa nibá.
April, Báïsákh,	Báïsagang, ...	....	....	Dowa súmbá.
May, (Jet'h,) .	Jeshtang, ...	....	....	Dowa zjiba.
June, (Assár,)	Asháráng, ...	....	....	Dowa girápá.
July, (Sawan)	Shownang, ...	....	....	Dowa dúkpá.
August, Bádor,	Bádrang, ...	....	....	Dowa dúnpá.
Sept. (Asowj)	Indromang, ...	....	....	Dowa ghetpá.
Oct., (Kátik,)	Katung, ...	....	....	Dowa gúpá.
Nov. (Maggar)	Mokshirang, ...	....	....	Dowa chúpá.
Dec., (Poh,) ..	Poshang, ...	....	....	Dowa chúk-chíkpá.

Tibet, Name of.

Cashmir—Europeans.—Gnaree is the country between Busehur and Mansarawar, and the people call themselves Keao. Tartar or Tatar is unknown here, and so is Tibet. Captain Turner says, the Tibetans call their own country Pue-kocham, and Bootan is named by them Dukba. Tibet is understood by very few people, but the Cashmeerians apply it to Ladakh.—*Gerard, p.* 101.

Tibet is the English form of a Persian term. Tenboot is quoted by Malte Brun, II, 618, as equivalent to the kingdom of Boot, and thence perhaps, he says Tibet. *Ten* or *tan* now signifies ryots, subjects, or rather perhaps servants and followers, but the derivation seems nevertheless a good one. Mr. Vigne, I see, derives Tibet from *tibba*, (or *tepe* in Turki,) a peak, and *bod.*—*Travels, II,* 248.

I never heard of the term Pue Koachim, nor could I get a meaning to Pue as a single word. The Keao of Gerard seems to be connected with Koachim, and both may be so with Ghea or Gheaneh, by which is understood China, or the country of the Emperor.

Gnaree, (Gnari,) is of greater extent than is allowed by Gerard, (see under the head *chanthan*, name.) It is called Beang by the Kunawarees, and hence *beanghee*, applied to wool.—*Gerard, p.* 115.

Dukpa is the term applied to shepherd tribes generally, and it must have been erroneously identified with Bootan.

I may here add a word regarding Cashmir. It is called by the Bhotees and Kunawarees, Katch or Katchi simply, or Katch-yul, *i. e.* the country of Katch. *Mr. Vigne* (*Travels II*, 44-46) enlarges on the frequent occurrence of the word Kash; but without giving it the many geographical positions which he does, and even *he* omits some, it is probable that a tribe of the name once possessed the whole course of the Indus, if indeed the word has not a more general meaning and a wider application. *Kotch* is the common Persian term for migration, moving about, &c. Richardson says, there is a wandering tribe of Arabs so called, and to the present day there is in Afghanistan, a race of wandering Mahometans termed Kotchi. Katch, however, might at one time have been applied to Cashmir, to Cutch Bhooj, to Cutch Gandwa, and to the greater part of Chachar in its signification of a swamp or low country, and this would leave Kotchi unencumbered, and meaning simply wanderer.

It appears till within the last 70 or 80 years, the Cashmirees traded through Kunawar, and in several villages there are still to be found the graves of these carriers or dealers. In Kanam, a temple sacred to a *deota* or hill spirit, has been erected on the site of a house which belonged to the Cashmirees, and up to the present time, the villagers sacrifice a goat to the god of their former guests, in imitation, they say, of their practice.

Throughout Tibet, Europeans are called *filing*, (*feeling*, see also *Mr. Vigne, II*, 326). The origin of this appellation is worthy of some inquiry, as I have been informed, by a man of knowledge and research, that it is used by the Chinese writers before the conquests of the Mahometans could have made *Fwang*, familiar to the ears of orientals; and that it may have a more direct connection with the

Varangians, well known to us as the guards of the Byzantine Emperors, than with the Franks of Charlemagne or of Godfrey, through a Persian medium.

KUNAWAR, NAME OF.

At Le this is called *maun*, tea ; *maun* being one of their names for Bishahar.—*Moorcroft, II*, 353.

Kunawar called also Koorpa.—*Gerard, p.* 1.

Maun, I have usually heard pronounced *Man* (*maun*). Kunu is the ordinary Bhotee for Kunawar, and Kunupa or Kunpa means Kunawaree, or a man or thing of Kunawar.

Kurha is the Kunawaree for *pusi*, a kind of bread fried in oil.

Chanthan, i. e. *Zjangtang—Name.*—Along the eastern frontier of Ladakh in an almost semicircular line is the province of Chanthan, (*Moorcroft, II*, 360-1), or snow country, known to the Bhotias as Hundes, and to the Tibetans as Nari.—*Ditto, Note.*

Chanthan is properly Zjangtang, and is a descriptive, not a geographical, division of Tibet. *Zjang* means north, and *tang* means a plain or open hill or broad valley, and the tracts between Gano and the Karakoram range, are denominated Zjangtang, or the northern plains, from their comparative flatness, and from their position relative to Garo. The shepherd tribes of Tibet are called in Bhotee *zjangpa* and *dukpa*, and Changtang or Zjangtang would thus become equivalent to the shepherds of the plains, but I prefer the derivation of the northern plains, (see also Changpa, *Mr. Vigne's Travels*, II, 343). The Sikhs have corrupted Zjangpa into Champa, and give their *Chanthan* a very wide signification.

Nari includes these plains, as also the limited Chang of the Bhotees, and indeed all Tibet between Ladakh and Zunga, eight days' journey down the Burampooter. This place may be the Chang-hai Kanagher of the maps, which is about eight days' journey for a horseman from the sources of the river, and Zjang or Chang is no doubt the Dzang, &c. of our maps, by which term the Chinese seem to understand Tibet generally; but towards Garo and Lassa, Chang and Zjang mean two subdivisions only.

The goats which graze on the plains of Zjangtang produce the finest shawl-wool.

Chanthan, i. e. *Zjangtang*, *History of.*—Chanthan was formerly subject to independent princes, but their authority gradually merged into the supremacy of the chief pontiff at Lassa.—*Moorcroft, II.* 364.

These independent princes were Hindoos, and claimed a Rajpoot descent, (see also *As. Res. XII.* 434.) Their chief place was Chaprang on the Sutlej, and they ruled over the districts around the Mansarawar lake, and westward as far as Ladakh. The Pitti valley was also their's. In a war with the Ladakhees, the Raja was hard-pressed, and he asked aid from Lassa; but before assistance arrived, he was accidentally killed, or as one story has it, he was put to death by the Ladakhees while in the act of offering tribute. The Lassa force advanced and expelled the Ladakhees, but as the Chaprang family was extinct, the Lassa authorities retained the country in their own hands. A treaty was formed with the Ladakh Raja, and he married a daughter of the Lassa commander. The district of Pitti was given to Ladakh as the bride's dower, and 20 houses in the neighbourhood of Menser or Misser were added to it. A Raja named Kehar Singh, of Bissehir, was at this time on a pilgrimage to the Mansarawar lake; he formed a friendship with the Lassa leader, and perhaps gave his countenance to the usurpation of Chapran; for at this time two villages on the left bank of the Pitti river are said to have fallen under Bisseher.

The whole of the above is the common story only, and the events are said to have taken place towards the beginning of the last century with regard to the possession of Pitti. Another account states, that it was given to Ladakh, on the occasion of one of the sons of the Raja becoming the Grand Lama.

At p. 101, Gerard says, that certain villages of Tartars on the Sutlej, after many contentions between the Kunawarees and Chinese, were given up by the Grand Lama of Lassa for the support of the Teshigang temple, and adds in a note, that this temple although in Kunawar, is still partly supported by the Grand Lama. It is not so at present, for the temple is maintained from the produce of the lands attached to it, aided by its neighbouring village Namgheá and the contributions of the pious; nor would the Grand Lama, who is of the yellow sect, give assistance in his religious capacity to the

temple of a red sect. He may, however, have interfered in the dispute mentioned.

Garo, Name of.—Gardokh, called also Gartokh, Ghertope or Garo, itself is little else than an encampment, &c.—*Moorcroft, II,* 363. Garoo, Gartop, Gur, Yoogar, Zhoogar or Gurtokh, is a collection of black tents inhabited by pastoral tribes for six months. In winter, the Tartars retire to Eegoong, two stages down the stream, and the Chinese governors reside at the fort of Tuzheegong, where they have houses.—*Gerard, p.* 144.

There are *two* Garos, *one* an encampment where the fair is held, on the right bank of the Eegong or Higong river; this is called Garyersa by the Bhotees or Ram Garo, (*Yerram.*) The other on the left bank of the Higong, and two marches lower down, is a permanent place, and the winter residence of the governors. It is called Gar-gunsa, or snow Garo by the Bhotees, (*gun,* snow.)

Gardokh, Gartokh, Ghertope, Gartop, &c. are variations of Gartohs (the *h* being aspirated.) *Toh,* denotes place, and is equivalent to *abad* in Persian, and thus we have Gartoh, Rohtoh, (not Rohtuk or Rohdokh,) and perhaps other towns or places. The name Gartoh is chiefly used by the traders of Kemaon and Gurhwal as I have heard, Garo is the term usually given by the Kunawarees.

Yoogar, Zhoogar or Jugher means, *par excellence,* the residence of the governors. *Jugh* indeed implies the residence of any great man, but its simple meaning is to sit, to remain, as I have heard.

Eegong or Higong is a river, not a town, (see Eekong-choo, p. 6 and 23, Gerard,) and I have not heard that there is a fort at Tazheegung or Teshigang, which is a monastery.

Uchang, Lassa.

The court of Ouchong or Lahassa, have sent the most particular instructions.—*Gerard, p.* 105.

Uchang, (or *Utsang, Tib. Gr. p.* 197,) is a term of frequent application, and it includes both Lassa and Teshi Lonbo. U, is the province or district containing Lassa, and Chang (Dzang, Dshan, &c. &c.) is the name of the one containing Teshi Lonbo; and Uchang may be used as a short mode of expressing the union of the civil and spiritual powers.

The Yul-sung of Mr. Vigne, *Travels, II,* 249, is I imagine another form of Uchang, although *yul* means country, and also village.

The four Rivers, (i. e. the Indus, Burrampooter, &c. &c.,) and the Mansarawar Lake.—The river that may be regarded as the most striking and important feature in the geography of Ladakh, is the great eastern branch of the Indus or Sinh Khabab, the river that rises from the Lion's mouth, in reference to the Tibetan notion, borrowed perhaps from the Hindus, of the origin of four great rivers from the mouths of as many animals; as the Indus from the lion's mouth; the Ganges, Mab-cha Kha-bab, from that of the peacock; the Sutlej, Lang chin Khabab, from that of the elephant; and the Ster-chuk Khabab, or river of Tibet, from the mouth of the horse.—*Moorcroft, II.* 261.

Major Rennel says, the river that runs from Lanken, that is, Lanka, lake of Du Halde, is named Lantshon, or by Dr. Gilchrist's way of spelling, Lankchoo or Langchoo, for *k* and gare interchanged. Now this is little different from what the Sutlej is called in Chinese Tartary, that is, Lang Zhingchoo, or Langhing Kampa. I could not ascertain the meaning of Zhing, but it appears to have nothing to do with the name of the river, for the Indus is named Singhechoo or Singzhingchoo, as well as Singzing Kamper, and the last word means river.—*Gerard, p.* 23, 24.

The usual name of this river (the Indus) has been mentioned, but it is likewise called Kampa-choo and Sampoo, or Sangpo, all of which words in the Tartar language signify river.

The third river is said to be larger than the Indus, and is called Tamjoo, Damchoo or Erechumbo; that is, the Brahmapootra. The first word is recognized in the Tzango or Tzancire of Father Georgi, who crossed it on his way to Lhassa, and Captain Turner mentions the last at Teshoo Loomboo.

The fourth river is the Gogra.—*Gerard, p.* 133, 134.

The four rivers are the Indus, the Sutlej, the Kali or Gogra, and the Burrampooter; and the names are as follows: the Indus, Singchin Kabab or Kampa; the Sutlej, Langchin Kabab or Kampa; the Gogra, Mamchin Kabab or Kampa; and the Berampooter, Tacho or Tamjood Kabab or Kampa.

Sing is lion, *lang* is bull, (not elephant, although the Tibetan for elephant simply means, as I hear, great bull). *Mam,* is peacock;

tacho may be interpreted holy horse; *ta* being the Tibetan for horse, and *cho* being religion or the religious books. *Chin*, (the *zhing* of Gerard) is great, and *khabab* or *kabab*, and *khampa* or *kampa* are the same word, and mean "out of the mouth of." *Ka* or *ka* is mouth, and "*bab*" is "out of," or "issuing from;" and *khampa* or *kampa* is got by pronouncing "*kabab*" short, and adding the usual termination, "*pa*," thus *kababpa* or *kampa*. *Kampa* is therefore a vulgarism, nor could I ever hear that it means a river, as Gerard says.

The common legend, connected with these rivers are, that the Indus is named of the lion, from the bravery of the people who dwell along its banks. The Sutlej is named of the bull, from the violence of its stream, which roars and foams over rocks. The Gogra of the peacock, from the beauty of the women of the country through which it runs; while the Burrampooter is designated of the horse, from the excellence of the horses which pasture on its banks. The Sutlej indeed still rushes along with much of its ancient fury. Peacocks are still to be found on the banks of the Gogra, and its women may still be beautiful; but the people along the Upper Indus are no longer a valiant race, and the men of the Burrampooter eagerly purchase the horses of Yarkand and other places, as superior to their own. The name of the Burrampooter may require more examination. *Ta* meaning, as I hear, a certain horse known to tradition or history, as well as horse in general. The designation is rendered more particular by the addition of *cho* or religious, and it may have some connection with a settlement or conquest of the country by the horsemen of the northern plains.

Concerning the sources of the four rivers, a few words should suffice, as we have but few certain foundations to build upon, but the following extracts from Gerard may be quoted.

Mr. Moorcroft subsequently found out, that the stream which issues from Rawun Rudd is the Sutlej, *p.* 23. All accounts agree that the largest stream issues from the western corner of Rawan Rudd, or Langa, *p.* 27. Mr. Moorcroft could discover no outlet to this lake, (the Mansarawar,) although he formerly heard that a communication existed between Mapang and Lanka. My information is positive, that about twenty years ago, a stream which was rapid and crossed by bridges, ran from it into the Rawun Rudd, but is

since dried up, and the Lamas who reside on the banks, have an idea, that a subterraneous communication exists. The water of this lake, (the Mansarawar,) is said by Mr. Moorcroft and all my informants, to be quite fresh and well-tasted, while according to the Quarterly Reviewers, every lake without an outlet must be salt. Without supposing an outlet, it is difficult to account for the rise and fall of the lake, which are mentioned by every one, *p.* 138-9, (other extracts of a similar tenor might be made.) The natives, speaking generally, say, the sources of the above three rivers, and also of the Gogra, are at Mansarawar, by which nothing more is meant than in the vicinity of that place.—*Gerard, p.* 135.

The Tibetans call the Mansarawar lake, Mapang, and the Rawan Hrad, Langa. The name of the latter lake, if unconnected with Lanka and Rama's expedition, is perhaps the strongest argument we yet have for its being the source of the Sutlej, that river being termed by the Tibetans of the *lang* or bull. After many inquiries, I could not satisfy myself that the two lakes communicated, the one or the other, although traditions were mentioned to me to that effect, and my present belief is, that they are separated by a ridge of some elevation, an impression to which I think the perusal of Moorcroft's Journal, (As. Res. Vol. XII,) would likewise lead. I also feel persuaded, after many inquiries made with care, that the Rawan Hrad gives rise to no river. At the same time I confess, that my informants had never paid any attention to the point, they being quite satisfied with the legends which made the rivers rise in the holy lake undergound, or in some way.

Captain Gerard observes, that the natives, speaking generally, place the sources of the four great rivers at Mansarawar. He may mean that the holy hill of Gangri, which is the north of the lakes, and to make the circuit of which is a religious merit, gives rise to the four rivers. Such is agreeable to the majority of the descriptions or legends I have heard, and such is moreover literally true of the Indus which rises to the north of the mountain of the Sutlej, which has one source at least among its western ravines, and perhaps also of the Burrampooter, which takes its rise in all probability among its eastern off-shoots, while I have heard the story made good by the assertion, that the Gogra arose in the Mansarawar lakes, *i. e.* on the southern slopes of Gangri.

Captain Gerard remarks, that the existence of an outlet to these lakes is evident, because their waters rise and fall. This argument, however, would rather prove there was no outlet; the tendency of such an opening being to reduce the rise and fall, while in the present case, if the outlet were very free, it might reduce the variation of heights to almost nothing, for the feeders of the lakes are not large, and the slow melting of snow does not, like heavy rains, cause a sudden influx of water. Now Moorcroft in August, (1812,) considered the rise and fall to amount to four feet, and as the lakes are not I would say, (judging from the analogy of such of the streams north of the Himalayas as I have seen,) at their lowest until the middle of November, the rise and fall of the Mansarawar may be estimated at six or seven feet, a difference which in my opinion precludes the probability of a free egress for its waters, although it does not absolutely prove there is no such egress. The rise and fall however of Rawan Hrad are not known, and this argument does not affect the rise of the Sutlej in *it.* My belief, however, at present is, that the river has no connection with the lake, and Gerard, when he says, that the Sutlej has its origin in the lake, (*pp.* 27 *and* 137,) and adds, that Moorcroft found such to be the case, (*p.* 23,) asserts more than Moorcroft's narrative warrants. He distinctly says, he left the point unsettled, and does not appear to argue either way. *(See As. Res. XII.* 473.*)*

The main eastern branch of the Indus rises to the north of the Gangri hill, and is joined by the Higong (Heegong) or Garo branch at Teshigang. This eastern branch of the Indus, even when joined by the Garo branch, is not a broad, a deep, or a rapid stream, and is generally fordable until within a few marches of Leh. The Shayuk, or the branch rising in the Karakoram hills, is described as a more turbulent, and perhaps as a larger stream.

The Feeders of the Pitti River.—This river, (the Pitti,) has five branches. First the Para, issuing from Chumorcreel lake; it runs about sixty miles, and is then joined by the Zang-cham, a large and rapid stream; six or eight miles lower down it receives the Speetee, formed of two principal branches. Little further down, the united stream is joined by the Chaladokpo.—*Gerard, p.* 30, 31.

There is no separate feeder of the Para, termed the Zangcham, but Zangcham is a place on the right bank of the Para, about 3

or 4 miles above its junction with the Pitti, where there are sulphurous hot springs on both sides of the river, (temperature about 120.) The Chaladokpo is an inconsiderable rivulet, and *docpo* is indeed the word for a brook or torrent.

The Lee or Pitti, is composed of three principal branches only; 1st, the Lossar or Pitti Proper; 2nd, the Pin; and 3rd, the Para, which is nearly equal in volume to the united stream of the other two where it joins them. The three streams are laid down with, I think, considerable accuracy in the map accompanying Moorcroft's Travels.

Ti or Tee—(Water).—From a valley to the south descended the Gnuinthichu, a deep and rapid river.—*Moorcroft, I.* 209.—The other (river,) the Kakthi.—*Ditto, p.* 214, which (river) then takes the name of Sar or Lingti.—*Ditto, p.* 221, *(and also in other places.)*

In Kunawaree *ti* is water, and from the way in which the word is used in the above quotations, it is probable it has the same meaning in Kulu, (in which district Moorcroft was at the time.) *Gniun, p.* 209, is the name of a species of wild goat; not however the *skin* or *kin* of *p.* 311, *vol. I.*

Lingti or *Falung Dinda.*—It (an insulated rock) is called Lingti by the people of Kulu, and by those of Ludakh, Falung Dinda.—*Moorcroft, I.* 220.

Lingti is perhaps wrongly applied here; it is probably the Sar or Lingti, p. 221.

Lingti may be, water of separation—thus Ling seems to be used in composition in Upper Kunawar, and the adjacent Bhotee districts are equivalent to "side" in English: as "the north side," or "this side;" and in the same tract, the four cardinal points are called *lingji. Ti* is most likely water; see observations on the word.

Falung means simply a large block, and *dinda* means, "even with," so the term may be "the block even with boundary," or "the block on the boundary."

Climate.—Frost with snow and sleet commences early in September, and continues with little intermission to the beginning of May. From the middle of January to the beginning of February, we found the thermometer out of doors at night seldom above 15°, and on the 1st February, it was as low as $9\frac{1}{2}$°, &c. &c.—*Moorcroft, II.* 267, *&c.*

The winter (in Kunawar) is often rigorous. The winds blow with the greatest violence in October, and later in the year. Their direction is of course influenced by the valleys, but on peaks upwards of 20,000, and at heights of 16,000, the winds were always W. or S. W.—*Gerard, p.* 62.

In the Hungrung, district (of Kunawar,) with the exception of March and April, in which months there are a few showers, the uniform report of the inhabitants represents 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. The depth of snow is usually a foot, and two are very rare.—*Gerard, p.* 95.

At Changgo in Hangrang, about 10,000 feet above the sea, the thermometer at day-break on the 15th December 1841, was 6° below zero. At Churet on the Para, 16 miles above Changgo, and above 12,000 feet above the sea, the thermometer was 13° below zero on the 17th December at day-break, and it never fell lower during my residence there, that is, until the 11th February 1842. It was, however, very often below zero, as for instance, at day-break, on December 25th 1841, it was *minus* 12°, and on February 6th 1842, it was *minus* 6°. At Churet during January, the thermometer, so suspended that the sun's rays played freely on the bulb, varied from 50° to 58° when highest. Churet is at the bottom of a deep and narrow valley.

In the Hangrang and surrounding districts, in 1841, snow commenced regularly on the 27th November. From that date until the end of February 1842, it snowed more or less heavily, and nearly all day and night, for 39 days; it was cloudy or hazy, and snowing on the heights for 34 days, leaving 21 fine clear days only out of 94. The days of heavy snow were days of comparative warmth, the thermometer being 20° or 25° at day-break. The snow where not drifted, did not any where exceed 2½ feet.

At Shalkan on the Pitti river, about 10,500 feet above the sea, the thermometer in June, July, and August 1842, may be said to have ranged at sun-rise from 45° to 55°, and at sun-set from 60° to 70°. The temperature of the air when warmest was in the shade about 85°. On two or three occasions particular circumstances raised the mercury above, or depressed it below, the mean figures I have given.

During 1841-42, the winds in the districts above-mentioned, blew almost constantly from the South or South-west, as noticed by Gerard. A northerly wind was of rare occurrence. During the winter months, the wind was such as would be termed high or strong, and it was frequently varied by gusts of great violence. During the summer, the wind usually arose about noon, blew with moderate force, and subsided when night had fairly set in. The constancy of the wind from one quarter deserved some attention.

Of the seasons towards the junction of the Sutlej and Pitti rivers it may be said, that there is frequent snow from the middle of November to the middle of March; occasional light snow or rain according to the elevation, till the end of April; but May is fine, and a very pleasing month after the dreariness of winter. In June and early in September, there are some light showers. In July, August, and during half of October, showers are rare, but the sky is frequently cloudy or overcast. The occasional showers of the lower spots are falls of snow in the higher hills; and the ranges may be seen all hoary down to a certain level, the division being horizontal and well defined, while in early spring, the valleys remain filled with snow while the ridges are clear. Towards the middle of October, snow begins to fall on the lower peaks from time to time, and towards the end of November, it may be looked for every where; years however have been known in which no snow fell, or at least none to speak of.

Rain and Snow—Mud Walls.—As a proof of the absence of rain and snow, (in the Bhotee districts adjoining Kunawar,) I may mention, that the houses in Spitti are half-built of stones, with the upper story of unburnt bricks.—*Gerard, p.* 95, *Note.*

Snow falls frequently or almost constantly in these districts in the months of December, January and February. Walls of unburnt bricks are besides no argument for the absence of snow and rain. In India, the walls of houses are of mud, and in the N. W. Provinces the roofs are also of the same material. In the Bhotee districts in question, as elsewhere, the people clear the roofs of their houses of snow after each fall. The rain is seldom if ever so heavy as to have any effect.

Snow Glaciers.—Divided by precipitous mountains of amazing height most usually veiled in everlasting snow, *Gerard, p.* 5; vast

impending cliffs fringed with dark forest and topped with mountains of indestructible snow, appear on every side.—*Ditto, p.* 12. The snow beds that occurred on the road to the Pass must have been the accumulation of ages.—*Ditto, p.* 159.

It is to be regretted that the Gerards did not employ the same accuracy in general description, which they brought to bear with so much success, in ascertaining positions and in measuring the heights of mountains. Were snow everlasting or indestructible, or did it continually accumulate, the hills would always, and not usually, be covered. They would also increase in height, which they do not. The hills are indeed perpetually covered, but this is owing to the annual fall, and not to the indestructibility of snow.

Snow is blown from the tops of hills, or it falls in avalanches, and melts, or it becomes a mass of half-ice and half-snow, gradually melting above and below, owing to the superior heat of the atmosphere and of the earth on either side of it. On the slopes of hills, the water so produced, sinks and re-appears in springs at lower levels; in ravines, where there is always an accumulation of frozen snow, of some, but not of a *perpetually* increasing thickness, the superior warmth of the rocks aided by springs, melts the frozen mass, and forms a stream below it; while the atmosphere melts and forms a stream on the upper surface of the congealed snow.

In the steep, narrow, and irregular sided ravines of Upper Kunawar, I cannot say that I have seen any glaciers properly so called; but the masses of frozen snow at the bottoms of these ravines, are glaciers in every respect save in motion; the smallness of their bulk, and the varying width of the ravines do not admit of gravity overcoming friction, and the mass is unable to descend. In the higher parts of the hills, there are no doubt glaciers on a small scale.

Winter Travelling.—The people say, that the highest Passes might be traversed even in the middle of winter, were it not for the severe frost that prevails in these serene regions, which is made more keenly sensible from the great scarcity of fire-wood. The road from Shealkar (in Kunawar) to Ladakh is travelled throughout the year, and indeed January and February are the usual months in which the Kunawarees visit Leh, the capital.—*Gerard p.* 96. The road to Ladakh is never shut by snow.—*Gerard, p.* 111.

The highest Passes could be traversed in the depth of winter in spite of cold, were it not for the violent winds and uncertainty of the weather. The drifting snow conceals the track or road, and overwhelms the bewildered traveller, already benumbed by the piercing wind. If, however, a calm day be chosen, and a number of cattle be driven before to tread down the soft snow, any Pass may be crossed with comparative safety.

After the falls of snow and the strong winds cease, that is in March, April, and May, the surface of the snow on the hills becomes hardened, and admits of travelling with ease.

No people go from Kunawar to Leh in January and February, who can avoid doing so. The Kunawarees set out on their journies in April and May, and return in August, September and October; some remain at Leh over the winter. Travellers in the winter should always be accompanied by villagers of correct local knowledge, as otherwise, a person may attempt to cross a deep ravine or gully, and become lost in the deep soft snow.

The Sutlej, &c. arrested by frost.—In winter, most of the streams that join it are arrested by frost, and the Sutlej itself is even frozen for 200 miles during two months at least.—*Gerard, p.* 27. Andthe people proceeding between these places, (Buseher and Chuprung,) in the cold season, travel upon the Sutlej, which is entirely frozen for two months at least.—*Ditto, p.* 146.

The surface of every small stream is frozen over during the winter, or rather frozen spray forms an irregular archway, beneath which there is a stream. The streams are never arrested so far as I have observed, nor is it probable they should be. The surface of the Sutlej is, I am sure, never continuously frozen; its edges are, and form the road alluded to by Gerard; and its whole breadth is frozen here and there where the water is comparatively still. The Sutlej is either too rapid to admit of surface ice, or too broad to allow the spray to form an arch over its stream.

Rapidity of Rivers, Theory of.—The rapidity of the large rivers, such as the Sutlej and the Para, cannot be expected to increase like that of the Teedong and Taglakhar, since the country through which they flow is not of so rugged a nature.—*Gerard, p.* 97, *Note.*

The ruggedness can scarcely bear on this point. The truth seems to be, that all the streams in question have their origin at nearly the same height, but the large ones have long, and the small ones have short courses, in which to find the same level. Thus the Taglakhar and Darbung torrents rise in the neighbourhood of Passes 18,000 feet high, as high perhaps as the remoter sources of the Pitti river, and yet they have to find the level of that river continued in the Sutlej. This sample of equal descent in unequal distances, seems generally applicable.

Former Lakes.—The people have a vague tradition that this valley (of the Buspa,) was once a sheet of water.—*Gerard, p.* 18.

There can be no reasonable doubt of the former existence of a series of lakes along the present courses of the Sutlej and its principal feeders in the hills. The Sutlej has now indeed attained an equilibrium, and forms one continued rapid from its source to the plains; but the traces of sheets of standing water are everywhere apparent, in parallel and horizontal deposits of pebbles, earth, and debris generally, which a narrow gorge, or a cleft at one end of these deposits, shew where the obstruction existed. These lakes gradually diminished in size until the lowermost barrier was burst or worn through by the continued action of water, and the bottom of these old pools now form the richest and almost the only cultivated lands in the northern hills. In these hills, the natural disintegration of the rocks scarcely anywhere affords a stratum of soil; and although I have in some places, near the flat tops of hills, found two feet or more of vegetable earth, yet as no stream of water can be brought to bear on it, this fine mould is useless to the people generally; some of the more industrious, however, carry a little of it away as a manure to their low-situated fields.

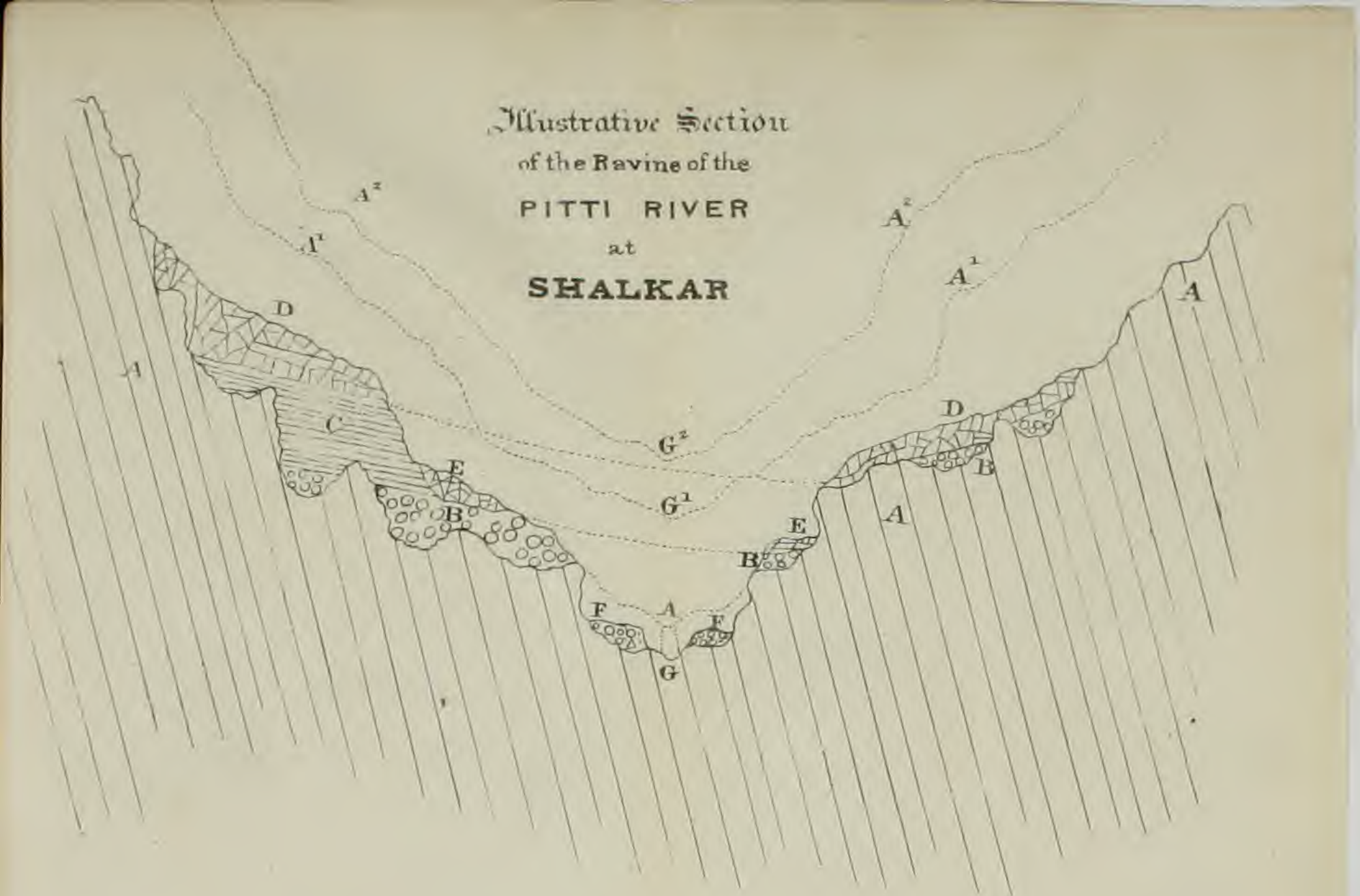
The want of available water is the greatest bar to an extension of cultivation in these cold dry countries, but on this subject, *Gerard, p.* 4, *Note,* and *Moorcroft, Vol. I, p.* 270, may be consulted. Captain Hutton's Tour *(Jour. As. Soc.)* may also be referred to.

The annexed cut will explain the present evidence of the former existence of lakes in the ravine of the Sutlej and its tributaries.

TITLES.

Garpan, &c.—The *garpan* of Gardokh.—*Moorcroft, II,* 251.

Illustrative Section
of the Ravine of the
PITTI RIVER
at
SHALKAR



AAA The ravine as left when the section is taken on the cessation of the Volcanic or Subterranean movements.

AĠA The ravine at the highest barrier when first instituted some distance below the barrier A

ÁĠÁ Similarly a second barrier but near or to the place of section

G The present Channel of the River

AG The distance cut through rock by the action of the river.

B The debris chiefly rounded stones but including large irregular fragments first washed and thrown into the ravine.

C Clay or fine soil held in suspension by the waters during the Volcanic movements and afterwards deposited.

D Debris fallen or washed from the higher portions of the hills from year to year.

E The talus of D

F The remains of the same original debris as B modified in arrangements by the fluctuation of the channel above A in the descent of the river to G.

Note at Shalkar the height of the uppermost above the lowest G may be about 400 feet

From Lhassa two officers, natives of the country, are sent to Gardokh as *garpans.—Moorcroft, II,* 365. The subordinate management of the districts is entrusted to two officers, called the *deba* and *vazir.—Moorcroft, II,* 365. And two *amhans* sent from Pekin, now permanently resident at Lhassa, and engross the political administration of the state.—*Moorcroft, p.* 364-5.

The Chinese Tartars have officers of various designations: 1st, *umba,* superior to the rest; there are several at Yarkand and Lassa; 2d, *garpan,* military commander, of whom there are two at Garoo; 3d, *deva,* governor of a town; 4th, *zougpun,* governor of a fort; 5th, *poupon,* in charge of a district; 6th, *lassa,* chief of one or more villages.—*Gerard's Kunawar, p.* 145. A *garpun* or governor stays here (Speetee) on the part of, &c.—*Ditto,* 147.

The *zougspun* of Rodokh.—*Moorcroft, II, p.* 436. Their governor, the *goba* of Mirak.—*Moorcroft, p.* 437. I applied therefore for assistance to the *karphan—Moorcroft, p.* 448. The chief man or *garpan.—Moorcroft, II. p.* 16. The *karpun* or local governor.—*Moorcroft, II,* 42.

Garpan means the "holder" or "doer" of Garo. *Pan* is exactly equivalent to the Persian *dar,* and the governors of Garo only are called *garpans.* The term does not mean *any* governor, as is implied in some of the above quotations.

The *garpans* as mentioned by Mr. Traill, *As. Res. XVII,* 46, are also called *urgu-ma* and *urgu-la,* which I understand to mean the persons right and left of the great one; *i. e.* the honored and confidential servants of the Raja or Emperor. The words would be more correctly written *uku-ma* and *uku-la. Ku* is the Bhotee for image; *la* is given as right and *ma* as left, while *u* is considered as equivalent to, on the head of.

Pan as equivalent to *dar* in Persian enters into other words, as *zungpan,* equal to *killada. Zung* being fort in Chinese, or in the Tibetan of Lassa; also *karrpan* has the same meaning, *karr* being fort in Tibetan, as *dankarr* in Pitti, *shalkarr* in Upper Kunawar, *taklakarr* near the Mansarawar lake.

There are two *ambans* (the *n* is scarcely sounded) in Lassa. They are usually relieved every three years. They are nominally the commandants of the guard of honor of the Gheawang Rinbotcheh, com-

posed of Chinese or Mantchu soldiers; but they are really the deputies of the Emperor, although orders do not run in their names.

Deba or *deva* is a rank only, and the possessor may or may not be the governor of a town or district. It is I suspect a term applied by the people of India only.

Paupon, or as I have heard it *paupo*, appears to be applied to the manager of one district only about Garo; viz. that of Chumurti.

Lassa is the deputy of the head-man of a village. The head-man is called *goba* or *gatpo*, but the signification of *goba* appears to be extended occasionally, and the head-man of the Rupshu district of Ladakh is called *goba*.

The *karpaun, Moorcroft, vol. I, p.* 448; *garpun, vol. II, p.* 16; and *kapun, vol. II, p.* 42, appears to mean *karrpan* or *killadar*, as above explained.

The *zungpani* are placed over large districts, the *karpan* over small. The different designations however of petty local authorities seem to be very numerous.

I may here add, what I have heard of the different authorities at Lassa, as my information somewhat differs from that given by Hamilton in his Gazetteer, almost the only book my position has allowed me to refer to.

Under the Gheawang Rinbotcheh, comes the *Bhot ghelpo* or Raja, or King of Bhot. He is usually an incarnation, but if any delay takes place in the spirit of the deceased finding a habitation, the Gheawang Rinbotcheh selects a person from one of the four great monasteries. Whether he is deposed on the re-appearance of the divinity in a human form, I cannot say.

Under the *ghelpo* are four *kolons* or *sawangs*, *i. e.* vazirs. These four men form the executive government of the country.

Under the *kolons* or *sawangs*, are eight *dappans* or military commanders.

There are six *changzuds* or treasurers.

The subdivisions of the country are managed by *zungpans* over the large, and *karrpans* over the smaller.

Nuna.—One of whom was the *nuna* or deputy *khalun, Moorcroft, I,* 248. The business of the government is administered by the *khalun* or prime minister, assisted by the *nuna khalun* or deputy.—*Moorcroft, II,* 334.

Nuna or *nonu* does not mean deputy, but is simply a title of respect, and as such, is applied very generally.

Banka, Narpa.—The *banka* or master of the horse. The magistracy is discharged by officers called *narpas.*—*Moorcroft, I,* 334-5.

Banka is a village and not a rank; but at the time of Moorcroft's visit, the *banka-ha* or *wala,* or *master* of Banka, was the master of the horse in Ladakh. This *bankaha's* name was *tanzin,* with the respectful prefix *nonu.*

Narpa or *nirrpa* is rather I think a sort of treasurer or steward than a magistrate. I would say that *karrpan* or *zungpa,* that is, *killahdar,* is the proper equivalent of thanahdar or magistrate.

Khaga, Tanzin.—And the *khaga tanzin.*—*Moorcroft, II,* 230. The administration is entrusted to inferior *khaluns, tanzins,* or Rajas. —*Do. I,* 335. And he with *khaga khan.*—*Do. II,* 60.

Khaga or *gaga* is a title of respect. The Tibetans also call the chief of the Kalmuks *gaga,* and it may have some connection with the *chagan* of the Avars, for all are no doubt modifications of the terms *khakan.* In Ladakh, &c. *khaga* or *gaga* is a title very commonly bestowed.

Tanzin, at *p.* 335, *vol. I,* is given as the name of an office, but at *p.* 230, 408, &c. it appears rather as a proper name. It is indeed in common use as a proper name, and although Hamilton in his Gazetteer, Art. "Tibet," applies it to an appointment or station, and gives its meaning as equal to a great man, yet after some enquiry I could not hear of the word being applied to an office, either in Lassa or in Laudakh. "*Yin*" indeed may be *tchin, i. e.* "great," and *tan,* means a subject (ryot) or rather a personal dependent.

Bridges.

The different sorts of (bridges) are first *sango,* or wooden bridge, of which there is a print given by Captain Turner; 2nd, the *jhoola,* or rope bridge; 3rd, *suzum* is formed of twigs very indifferently twisted; 4th, *chukhzum* or chain bridge. There is one over the Sutlej under Tholing. The above are used over large rivers.—*Gerard, p.* 33-35.

1st. *Sango* is not the Kunawaree or Bhotee term for a wooden bridge. It is used in the Southern Himalayas for I think any permanent bridge, and it is derived I presume from a Sanscrit word of simi-

lar import. A bridge of the kind alluded to, is called in Kunawaree and in Bhotee, *jampa* or *jambah.*

2nd. *Jhoola* is not a Kunawaree term, and the sort of bridge is not known or used in the Bhotee district in question. The Kunawaree term is *torang.*

3rd. *Sazam* or *chazam,* is the Bhotee term for a bridge of twisted twigs. In Kunawaree such a bridge is called *tran.*

4*th.* *Chakzam* means, as Captain Gerard remarks, iron bridge, but although I never saw the particular bridge alluded to by him, I have every reason to suppose it is an ordinary wooden one with an iron hand-rail. It is, however, familiarly called the iron bridge.

Customs.

Ears of Grain suspended, &c.—The top of which (pillars of wood) is in the houses of the peasantry encircled by a band of straw and ears of wheat. It is the custom, I was told, to consecrate the two or three first handsful of the last year's crop to a spirit which presides over agriculture, and these bands are thus deposited.—*Moorcroft, II,* 317-18.

The Tartar husbandmen have a custom similar to those of some of the Scotch farmers who, &c. &c. The Tartars use three ears of barley, which they paste outside over the door.—*Gerard, p.* 98.

This superstition apparently takes various forms along the lower course of the Pitti. I could not hear of the exact custom mentioned by Gerard as prevailing at Nissang on the Sutlej ; nor could I hear of that mentioned by Moorcroft. I saw, however, in temples, bunches of ears of barley, (always an odd number in each bunch,) hung up before images, and I understood that in Pitti itself, bunches were similarly hung up in the houses.

Presentation of Silk Scarfs.—This person who was styled *Lafa,* visited me twice, and we exchanged scarfs, which is an invariable custom.—*Gerard, p.* 104.

Lafa is the title in Tibet of the deputy of the head-man of the village, and he is a very small functionary indeed; but Captain Gerard seems to have seen things in these countries through an illusive medium. Elegant houses, magnificent temples, and honest men !

Equals exchange scarfs or smaller pieces of silk; inferiors *present* them as they approach; and superiors *bestow* them when they dismiss. See also *Captain Turner*, 72, 233, and *Captain Hutton's Tour*, III, 17, Journal of the Asiatic Society. A scarf (or *kattak* in Bhotee) is invariably sent with a letter, and under the same cover with it.

Prefixing the s in Bhotee and Kunawaree —The principal pergunnas or divisions are and Spitti or Pitti.—*Moorcroft, I*, 315.

The male (ibex) is called *skin*, and the female *l'danmo.*—*Moorcroft, I*, 311.

The Tartars often add *k*, for instance, *ropa* is called by them *ropak*, and they have a way of prefixing *s* to some words as *pooee, spooee*; *peetee, speetee*; and *tango, stango.*—*Gerard, p.* 99, *Note.*

The pronunciation of the Tibetan language admits of a slightly hissing or aspirated commencement to many words, but I would say that the custom of prefixing a clear and distinct *s* is prevalent rather about Rampur on the Sutlej than in Tibet. The habit has, however, been largely followed by our travellers through Kunawar, as they are generally accompanied by some people of the Bíssehir Rajas, who by long residence about Rampur, (if they are not natives of that quarter,) have adopted the custom. Pitti and not Spitti, is the correct term, as is likewise *kin* (or *kin*) and not *skin*. But although I could not ascertain that the prefixing of the *s* is a custom in the Bhotee districts adjacent to Upper Kunawar, it may obtain in other parts of Tibet, as Moorcroft and also Mr. Vigne, write *skin* for *kin*. The former moreover uses *zongspun* instead of *zungpan*, a *killahdar*, (II, 436,) and says Pitti is called Spitti. In the writings of respectable people, I always found Pitti.

The custom mentioned by Gerard of adding a *k* is occasional, I think, rather than general, and the addition is rather an aspirated *h* than a full *k*; such irregularities or uncertainties of pronunciation are common among illiterate people, and in trying to ascertain the true pronunciation of words, I have been perplexed by the different ways in which the same person often pronounced the same word.

The village Pooee or Spooee, quoted by Gerard as a proof of the prefixing of the *s* being a custom of the Bhotee, is an unfortunate instance; the Bhotees, *i. e.* the inhabitants, call their village *pura*, or *puba*, the Kunawarees and others lower down *pueh* and *spueh*.

Captain T. Hutton's Tour.—I have more than once referred to Captain Hutton's Tour in Kunawar, performed under the auspices of the Asiatic Society; and while I am about to conclude this paper by correcting or modifying some of his statements, I must in the first instance bear witness to the general accuracy of the impressions he conveys.

Rampur.—Rampur is a considerable *entrepôt* as well as a *manufacturing* town, *vol.* I, *p.* 4, as is also evident from what is subsequently said of the fair, *p.* 5. Among the Tibet exports to Rampur, *p.* 5, Charas should have a permanent place, instead of being omitted or included in an et cetera.

Raja of Bissehir, &c.—The Rajah of Bissehir *has* a legitimate son, as well as an illegitimate one, *vol.* II, *p.* 6; he has also *four* chief vizeers instead of *three,* the fourth being a Kunawaree placed over the Tartar district, and now changed from time to time. The only inferior officer called vizeer by courtesy, may be the person placed over Rampur.

Charias.—The *charias, vol.* I, *p.* 6, were originally chosen from the wealthiest families, but several have now fallen to decay. There are, that is, ought to be, upwards of 80 of them, as 50 are required from Kunawar Proper, and about 40 from Dassow. In Kunawar the revenue is fixed, and in that district the assessment *cannot* therefore depend on the report of a *charia.*

Revenues—British Tribute.—All houses which pay revenue supply a *hazri, vol. I, p.* 7, same as those which furnish a *charia* each. They muster about 300 in all.

In Kunawar, no house pays I think less than 8 annas on account of the British tribute, *vol. I, p.* 7, and none more than 9 rupees. The vizeers pay nine, and these are the limits instead of twelve rupees for vizeers, and from ten rupees to four annas for other people, as Captain Hutton was informed. I may here mention, that the Raja when we imposed a tribute on him, did not lessen his own expences in order to meet it, but levied an additional tax on his subjects for the purpose. Our rule is therefore felt as a grievance by the people, and not by the Raja.

Captain Hutton says, the whole revenues of Bissehir may be estimated at 50 or 55,000 annually. In 1817, they were estimated at

67,000, and that *quasi* official authority, the "Bengal and Agra Gazetteer" for 1841, gives them at 1,40,000.

No wool or *neozas* are levied as revenue, *vol. I, p.* 7, neither are raisins demanded, but the lands attached to forts supply the wants of the Raja. In stating this, I do not mean that the Raja does not make his people supply him with fruits, but merely that the taxes, proper and understood, do not include them.

Punishment.—For crimes and misdemeanours, people are hanged, mutilated and imprisoned, *as well as* fined, *vol. I, p.* 7-8.

Sarahan.—Sarahan, *vol. I, p.* 10, is *not* in Kunawar, but in Dassow. The boundary of the two districts is the Murad Ghat, *above* Sarahan.

The Juniper.—The juniper, *vol. I, p.* 29, is called *lewr* about Rampur, *shur* in Kunawar, and *shukpa* in Bhot; and *not lewr* and *shur* in the last named districts respectively.

The Gigantic Chakor.—The gigantic chakor, *vol. I, p.* 37, is *not* called *bheir* in Kunawaree. It is so called about Rampur. In Lower Kunawar, it is called *lipaia;* in Upper Kunawar, *kuleh;* and in Bhotee, *gungmo* or *komo.*

Apricots.—Leeo is *not* the last village towards Pitti where apricots occur, *vol. I, p.* 41. At Shalkar there are abundance of fair apricots, and also some trees at Sumra, twenty miles above Lio; but there the fruit scarcely comes to maturity.

Changgo, declining.—The picture of Changgo, *vol. I, p.* 41, is overdrawn. There are now 121 souls in it, that is, 21 *more* than when Captain Hutton said it was so populous. Its decline is *not* continuous, but may have been *temporary, i. e.* some poor families may have gone away for a season or two. It now produces *more* than its people eat. A rotation of crops *is* practised in Changgo, and the inhabitants *have* a very fair proportion of cattle, which they graze towards their outvillage of Changrezing. The fields of bare and hardened sand are still occasionally cultivated, but one crop exhausts them, or their produce is weakly, and of no value.

The Para.—The Para river, *vol. I, p.* 45, does *not* in all probability come from the Chumorenil lake, see *As. Res. XVIII, Pt. II.* 259, and *Moorcroft, II,* 52.

Frost Rivers.—The severity of *frost* can scarcely affect the supply of water to a river, as Capt. Hutton supposes with reference to the Pitti,

vol. II, p. 47, unless indeed a spring or a stream be dispersed over a flat surface, and turned into ice; but I have never seen any stream so arrested, and I have seen many small ones flowing when the thermometer was below zero. A comparison between the Pitti and Sutlej is not easily made, but where Captain Hutton saw the two rivers, the Pitti was the broader, and therefore the larger *looking;* but I think that during the winter, the Sutlej is really the larger. Dr. Gerard must, I suppose, be quoted with reference to the Sutlej in the lower hills, where he says its least breadth is 211 feet. Captain Gerard (*Account of Kunawar, p.* 26,) gives the breadth at Namptu, a little below the junction of the Pitti as 106 feet, and at Wangto as 92 only. Near Dubling, the united streams rush between rocks scarcely twenty feet apart.

I do not agree with Captain Hutton, in what he says, *vol. II, pp.* 2-3, regarding the rise of the rivers of the plains in June, &c. or their fall in January. The melting of snow is a slow operation, but the descent of rain is rapid, and the streams so formed, soon reach the larger rivers and swell their volumes. I am clearly of opinion, that four-fifths of the water in the Sutlej, when in *full* flood, is the produce of rain, and not of snow; and that no severe frosts in any Himalayan regions could in the month of January affect the river Indus in Sindh; but while snow fell on the tops of hills and was slowly melted, rain fell on their sides and in the valleys, and was quickly carried into the main streams.

Shawl-wool Goats.—The shawl-wool goats are *not often* four or five horned, *vol. II, p.* 4, but occasionally so only, as a man is *sometimes* found with six fingers.

Lamas.—There may not be any really good Lamas in Hangrang or Pitti, as Captain Hutton says, *vol. II, p.* 23, although I presume his informants simply meant, none of eminence or sufficiently versed in their scriptures; but it is *not* the custom to make any wealthy family man a priest, and marriage *is* allowed to certain sects of Lamas.

Pargyul Mountain.—I could not learn that Pargyul meant conical, *vol. II. p.* 24, but connected with this high and holy hill there is a saying, that goats whose horns meet at top, salaam or make obeisance to it. This story and the joining of his informant's hands in imitation of the goat's horns, may have been in Captain Hutton's head when he wrote.

Ripening of Crops.—The crops of Changgo and Lio are usually ready for the sickle in all July, *vol. II, p.* 25; but those of Hanggo certainly are *not* until a month or six weeks afterwards, see also *vol. III, p.* 19. The crops of Hanggo were green in 1842, while those of Sungeram and &c. were being cut. Captain Gerard, *p.* 66, leads I think to a wrong inference regarding Namghea and Shipkeh. He says, that in August the crops of Namghea (9,300 feet) were green, while those of Shipkeh, 1,400 feet higher, were being cut. Captain Gerard perhaps found the second crop at Namghea well advanced, as on the 15th July 1842, the first crop was nearly all cut.

Bhotees Bathing.—Captain Hutton was fortunate in seeing what I never beheld; viz. Bhotees bathing, *vol. III, p.* 6; that he saw them, I know, as he has himself told me so, but this was the exception to the rule, and they themselves confess, that it is not *their* custom to bathe, and that their more respectable people only put on new clothes when their old ones are much worn and very dirty.

The Snow Fish.—Captain Hutton somewhere mentions the snow fish, but I cannot at present refer to what he says regarding it. It is called *ganghal* in Bhotee and Kunawaree; it is said to live at the lower limits of the snow only; to be seldom if ever found alive (a slip of snow occasionally carries one down with it); and so far as the people know, one only has been found in Kunawar.

They say it has a face resembling that of a man, four legs, and no marked tail, (as a lizard has.) Its flesh is considered efficacious in certain diseases, and such as are found, are usually taken to the holiest Lamas, who distribute pieces of it as specifics. The skin is said to be used for some ornamental purposes.

ADDENDA.

Hassan Abdal, the Indus at Attock.—Before leaving Moorcroft's valuable book, I will go somewhat further than I at first intended, and point out the errors into which he, and even Elphinstone, whose volumes I always take up with respect, have fallen regarding two places well known to those who have crossed the Punjab. *Moorcroft, II,* 319, and *Elphinstone, II,* 99, say, that the tomb of Baba Wali is in a square enclosure at the foot of the hill which rises above Hassan Abdal. The tomb of the saint is on the top of the hill, and not at the

bottom; it is kept in repair, and owing to its white color, forms a conspicuous object at a distance. The tomb below is I believe that of a lady of rank, but there is no inscription. It is, allowed to fall to decay.

Elphinstone was probably unacquainted with the legend which Moorcroft gives. He does not relate it, and this increases the reasonableness of a modification of Moorcroft's suspicion; viz. that the story is of recent Sikh adoption, and that the stone bearing the impress of a hand, has been lately produced to satisfy the superstition of believers.

There is a Mahometan legend, that Abdal the fakir came to the place and asked Hassan, the cowherd, for a draught of milk; Hassan said he would gladly give him one, but that his cows were dry. The fakir pleased with the disposition of Hassan, placed his hands on one of the cows, and desired him to milk the animal; he did so, and gave Abdal a good draught. Abdal then asked the cowherd what he would chose as his reward, Hassan said they were much straitened for water in his neighbourhood, and that a supply of that necessary element would be valuable to himself and to others. The saint struck the hills where he had been refreshed, and also at Wah-wah, and water gushed forth.

This legend may have existed before the rise of the Sikhs as a sect; but as they extended their power, they desired to increase the fame of their apostle. They found a miracle to appropriate, and they did so at the expense of the Mahometans, their predecessors. The saint of the new faith performs the *old* miracle, and shews to his rival the superiority of his power.

The *granth* or shrines of the Sikh scriptures was established at Hassan Abdal about 1813. I do not agree with Moorcroft in his *reasons* for his suspicions about the legend. He says, a few years only have elapsed since the place was in the possession of the Affghans, whose fierce Mahometanism would have tolerated no Sikh pilgrims or shrines within their boundary. In Affghanistan itself, there are places visited by the Hindoos; the fierce spirit of the Mohametans shews itself upon rare occasions only; and in populous tracts, the Mussulmans everywhere admit, and sometimes participate in, the superstitions of the vulgar. As an instance, I may quote the Ziarat at Jellalabad, which is visited by both Hindoos and Mahometans, and also the Hindoo temple of that town, said to produce 40,000 rupees annually, (*see Journal of the Asiatic Society of Bengal, CXXII*, 128.)

At *p.* 325, *vol. II*, Moorcroft says, "On the right bank (of the Attock,) at the place where it turns, is the rock of Jelalia, and opposite to it that of Kamalia, between which is said to be a dangerous whirlpool."

Elphinstone, II, 96, says, "In the midst are the famous rocks Jelalia and Kamalia, but the whirlpool of which we had heard so much, did not rage at the season when we passed." These rocks are not in the middle of the river as stated by Elphinstone, nor on opposite sides as mentioned by Moorcroft; but both are in the right bank; nor, excepting in a sort of bay, could a whirlpool be formed in a narrow and rapid river. The *danger* consists in crossing the stream when flooded, for to be dashed against the projecting rocks would be certain destruction, and the *object* is to direct the boat free of the upper rock, and into the bay above the lower one, so as to effect a landing where the water is comparatively quiet, that is, just below and under shelter of Kamalia. There is no whirlpool properly so called, that is, the rocks and rapid stream are to be feared, and not the ingulping powers of the eddy.

Report on the Agricultural and Land produce of Shoa. By Captain Graham, *Bengal N. I. of the Mission to Abyssinia.*

"Natura beatis
Omnibus esse dedit, si quis cognoveret uti."

1. The different modes of tilling the ground practised among the various nations of the earth, are well worthy of observation and remark, as the progress of agriculture exhibits the progress of the population in comfort and civilization, and thus forms one of the most important chapters in the history of national manners; and indeed the tracing its gradations through the various customs of different people, from the first glimmering bestowed upon the located savage, to the full development of the science of husbandry in the most civilized society, is a curious as well as a profitable task, for its present state may be taken as a tolerable criterion, whereby to judge of the relative position which the people hold in the scale of nations.

*

2. In a populous country where there are no wild animals to fill up the deficiency, and but few spontaneous fruits to mitigate the pangs of hunger; and where the search for wild roots would prove but an unprofitable labour, the pursuit of agriculture must necessarily be deemed of high importance, and carried to that point which places the nation in a state of comparative plenty; but there is a wide gap to be filled up between this period and the time when those causes are developed, which render agriculture purely commercial, and Abyssinia remains at present in this lethargic position.

3. Still she has emerged considerably from that state of society which is denominated barbarian, and elevated far above the hunting or savage, by the power of taming and subjecting the lower animals, and by practising a species of agriculture, to which the fertility of the soil has hitherto granted an abundant return. The extent of cultivation also is very considerable throughout the kingdom, and this important branch of industry has progressed far beyond any art hitherto discovered amongst the nations on the western coast.

4. Private property in the land is everywhere sanctioned, allowed and established; there are few forests or wastes, excepting those impracticable for pasture or cultivation. Farm-steadings and individual dwelling houses embellish the aspect of the landscape, reposing secure from predatory bands, or hostile neighbours; and although a great part of the population is collected in towns and large villages, yet the country is also abundantly inhabited. The processes of preparing the ground are somewhat complex; the plough is in use to the exclusion of the African hoe, and considerable industry is evinced in collecting and distributing the waters in artificial irrigation. The grains which on the other coast are coarse and small, rather like seeds than grain, and fitted less for bread than pottage, are here of a large and full pickle, and in every variety. The people are possessed of a written language, and the king of the country inhabits stone houses, which rise two stories above his fortifications.

5. Unburdened by an over-population, and possessed of a fertile soil and favourable seasons, in the absence of all luxuries a sufficient abundance is produced for the mere maintenance of life. Yet still the science of husbandry is little understood, the implements of culture are few, and of the rudest construction; the various methods of assist-

ing nature are entirely unknown, the capabilities of the country are not taken due advantage of, and unless some European power interferes for good with the strong hand, a great length of time must inevitably elapse before the habits and prejudices of this uncivilized nation be overcome for its own benefit.

6. The climate of the Abyssinian mountains and table land is altogether favorable for cultivation; here there is no winter,

> "Such as when birds die
> In the deep forests, and the fishes lie
> Stiffened in the translucent ice."

Neither does the sun blaze in malignant light on the head of the husbandman, nor do burning blasts unseasonably wither the crops; but the coolness of the mountain breeze is pleasant and refreshing, and the timely cessation of the rain allows a healthful rest to vegetation, while its periodical return, soon produces the usual displays of young shoots and budding flowers.

7. The seasons are regular, and the atmospheric changes so distinctly marked, that the inhabitants are enabled to calculate when the rains will commence and when they will cease, and are thus fully acquainted with the amount of labour to be performed, before the arrival of the stated period. The rain of "bounty," and the rain of "covenant," are each in their turn taken advantage of by the husbandman, and immediately after these down-pourings, nature who had remained bound up in the rigidity of the preceding drought, bursts forth into a thousand interesting forms; the pastures and meadows are clothed in cheering green, the hills and dales adorned with myriads of beautiful flowers, and the sides of the mountains appear one sheet of the most luxuriant cultivation.

8. The soil is fertile, and without artificial manures or any great expenditure of bodily fatigue and exertion produces a plentiful supply of food for man and beast; but notwithstanding all these local advantages the ignorant Abyssinian has hardly emerged from the first rudiments of the art of husbandry, and although nature has been so prodigal, the prejudiced inhabitant has taken little thought to benefit his condition by a proper use of her gifts and favours.

9. Every thing in the climate of Africa is in extremes, but barrenness and fertility of soil border upon each other with a degree of

suddenness, of which the inhabitants of temperate climes can form little conception. Passing in an instant from the burning plains of the Adaiel to a rich landscape in which flocks and towns and villages abound, the strange sight is afforded of regularly marked fields, mounting in terraces from the very base of the Abyssinian mountains, throughout a steep ascent of five thousand feet which leads the traveller to an unlimited table land, where the eye is perfectly satiated with the endless succession of waving crop and rich green meadow.

10. And although the soil on the mountain side requires artificial support to preserve the earth from being washed away, and in many places reposes in an angle where it seems hardly possible for the plough to pass, yet wheat and barley delight in a dry stony ground, and with a fair proportion of the "former" and the "latter" rains, will yield an abundant return to those who feel their industry called forth, to emulate the prosperity of their more happily located neighbours.

11. Situated in the middle of the torrid zone, and surrounded by trackless regions, or by tribes whose cruelty and bigotry are more dangerous to the intruder than the poisonous blast and the burning desert, secluded Abyssinia has remained almost a sealed book to the arts and sciences of the civilized world; and composed of groups and ranges of very high mountains overlooking wide plains and deep vallies, and being under the complete influence of the tropical rains, the difference of the climate in her relative parts is of the most varied description.

12. The high table land which is clothed with moderate vegetation, destitute of wood and freely ventilated, is at all times cool and healthy, and often extremely cold; whilst the low wooded vallies are close, unwholesome, and insufferably hot. During the cold season the thermometer on the summit of the range stands about 30°, and a thin coating of ice covers the pools, and the country appears white under a mantle of hoar and frost; whilst in the vallies, the quicksilver mounts to 90°, and the total absence of breeze renders the heat still further oppressive. At the termination of the rains, fever with all her attendant horrors spreads her pestilential wing over those beautiful locations, and during the month of September, even the wild birds forsake for a time the poisoned atmosphere, and betake themselves to the more genial climate of the upper regions.

13. The amazing fertility of these vales is beyond all conception, every species of crop attaining the most gigantic proportions; the rich soil, and the nurturing shelter, the abundant supply of water, and the ardent rays of the sun, all combining to crown the hopes of the husbandman; and these situations would have stood prominent as perfect in the creation, had nature blessed them with a climate corresponding in character to their lovely appearance.

"But putrefaction into life ferments, and breeds destructive myriads," and like the apples of the Asphaltus, the inviting beauty of the exterior forms but a gossamer covering to the seeds of death which lurk within.

14. On the sides of the mountains, the vegetation seems to be somewhat inferior in luxuriance, and may be accounted for from the reason, that the angle at which the sun's rays strike the ground, and consequently their power of imparting caloric, varies with the exposure of the soil relatively to the luminary. The eastern face of the mountains rising almost perpendicularly, can only for half the day receive the rays running even parallel to its surface, their effect must therefore be trifling, and for many hours in the warmest part of the afternoon, the surface is entirely obscured in shadow.

15. The aspect of the country is as varied as the climate. On the elevated plateau, a succession of gentle undulations of pasture and arable lands, intersected by green swampy meadows with bare banked rills streaming through the centre, rise in endless continuation to the view; not a tree disturbs the wide prospect, although the individual farm-steadings proclaim a country which has long enjoyed the blessings of peace. The craggy mountains rise in the centre in magnificent ranges, and are divided by a thousand chasms, in whose depths run clear gushing water, and tangled bushes and evergreen shrubs diversify the cliffs, many of which are covered with magnificent woods. In every nook and coigne of vantage, are to be seen and scented the eglantine and the jessamine, and an inexhaustible store of sweet-smelling flowers; the strips of intervening slope, the most desirable sites for residence, are clothed in luxuriant crop and herbage, fed by the oozing streams of the mountain; and the rich and smiling vallies repose at the foot of the range, hid in all the exuberance of foliage from the gigantic ficus, whose stem is upwards of forty feet in

circumference, to the light elegant acacias which distil the much-prized gum.

16. The absolute necessity of taking due advantage of the appointed season of rain, rather than any fixed purpose of economizing time and labour, enforces some faint attempts at arrangement and division of employment for the various months; seed-time and harvest, however, form the two great periods of exertion, and there are but few other agricultural operations to mark the remaining seasons of the year. Whilst not actually employed upon the ground, or when not compelled to attend the king on his military expeditions, the Abyssinian peasant drives a wandering trade throughout the country, disposing of his farm produce, horses, mules, asses, &c., or leads an idle life, without holiday, or much amusement at home.

17. The following table will serve as a register of work and weather in general accordance with Abyssinian custom and observance:—

1841.

Teok.—January.

Fine cold dry weather, sow barley for the February rain, make heaps of top parings, burn and plough in the ashes, gather in the September crop of cotton. Great Military expedition.

Yekkateet.—February.

Rain of "bounty" from the 5th to 2d March; sow barley, peas, beans, grain and wheat.

Mugabeet.—March.

Fine weather from the 2d to 16th, heavy rain on the 17th, 23d, 24th and 25th; sow barley and red wheat.

Maazia.—April.

Light shower during the month; 23d, two slight shocks of earthquake; sow cotton; gather in September crop of cotton.

Ginebate.—May.

Wind N. E. very strong and cold, rain towards the end of the month; sow juwaree and other grains in the valley.

Sunnee.—June.

Occasional heavy storms of rain, hail and wind till the 25th, when the rain of "covenant" regularly sets in. Gather the January crops of barley, &c.; sow teff, barley, wheat, juwaree, peas and beans; shear sheep, extract honey from the hives. Military expedition.

Amlee.—July.

Heavy rain and fog, sun seldom seen, weed crops, and make trenches in the fields, plant tobacco, goomun, gourds, chillies, onions and oil plant.

Naasie.—August.

Heavy rain and fog, chiefly at night, with occasional sunshine during the day ; weed crops.

Muscaram.—September.

Heavy rain till the 15th, plough, sow cotton. Grand annual review of Troops.

Tecumpt.—October.

Clear, cold weather with piercing wind from E., hoar frost during the nights, cut grass for winter hay. Commence gathering in the early June crops. Commence ploughing. Great Military expedition.

Hedar.—November.

Heavy rain on the 12th, gather in remains of July crops, also the April cotton crop. Shear sheep, continue ploughing, extract honey from the hives.

Tessas.—December.

A dry cold month with strong easterly winds, a slight covering of ice appearing on the pools, continue ploughing for February rains.

18. There does not exist any land measurement in the country, nor any returns whatever of produce or population ; but from a careful observation during many journeys in every direction, I have calculated that one-fifth of the whole surface of Shoa may be fairly considered to be under cultivation, whilst two-fifths are preserved as good meadow land, and the remaining two-fifths may be stated to be very indifferent soil, forest or impracticable rock.

19. The Christian population of Shoa and its dependencies, has in a former despatch been roughly estimated at a million of souls, and the Moslem and Galla tributaries at a million and a half. As this population derives its entire subsistence from the produce of the soil, even allowing two (2) pounds of grain per diem to each individual, (and any Abyssinian will devour double the quantity,) the amount annually consumed, would be 1,825,000,000 lbs., and giving one-fourth more for beasts of labour and burden, the amount would be 2,281,250,000 lbs. In countries where the art of husbandry has

made the highest advances, six (6) pounds of grain is reckoned a high weight of crop per ninety-nine (99) square feet, and granting to the imperfect cultivation of Abyssinia one-half of this produce, the extent of ground required to realize the above amount of grain would be 2,700 square miles, and as calculating that the Shoan population is scattered over an area of about 159 miles in length by about 90 in breadth, it would appear from this rough calculation, as well as from actual observation, that about one-fifth of the country is under the plough. The surplus of product annually imported into the country of the Adaiel and elsewhere, together with the seed corn, will be sufficiently accounted for, by the produce of the supplementary harvest, which is always taken advantage of by the more industrious farmer.

20. The ground belongs partly to the king, partly to the temporary resident governors of the districts, and partly to the inhabitants themselves. Where there is no previous right existing, a field can be purchased by a private individual on payment to the governor of a regulated present of honey, cloth or pieces of salt, and subject to an annual taxation of produce; but all the more favored spots of the country already appertain to his majesty, whether in pasture or arable land, and the royal magazines for grain and farm produce, are profusely studded over every portion of the kingdom. The price of a field of course varies according to its size and locality, bearing a nominal value in the district from three to twenty-five German crowns; but neither money nor value in kind is ever in the first instance paid down by the purchaser, the present is alone made to the governor of the village as an entrance fee, and the holder is made accountable for rent, according to the will and pleasure of the Government authority. Neither can a man part with his field to any individual without the express consent of the governor, who must be first propitiated by a present, and in the event of compliance, the half of the annual rent is assigned to the original proprietor as the payment of his land.

21. The king's fields are cultivated either by his numerous slaves who receive but a scanty pittance of food for their labour by the voluntary working of the whole district *en masse*, or by free peasants who receive as compensation a portion of rent-free ground for their subsistence and expenses; a third of their labour being demanded by

the king, they are allowed to work two days on their own lots of land, whilst the labour of the third day is appropriated to his majesty's property. The produce of the different allotments, is however quite sufficient for their subsistence, and for the establishment which they are obliged to entertain. The possession of a donkey, a pair of bullocks, a slave, and a woman to grind grain being absolutely indispensable, as all the various offices of farmer and miller, from the preparation of the ground, to the sacking of the flour, are performed by this class. A king's scribe is alone retained in each district, to enter into his books the amount received into the royal magazines under his charge.

22. The governors armed with the omnipotent authority of the despot, each play the autocrat in their own domains, and fashion their habits and privileges after those of their royal master. Their fields are cultivated in the same manner as those of his majesty, with the additional facility of enforcing the oppressed inhabitants to grant, for a very inadequate compensation in grain, many days labour in each of the great agricultural operations of ploughing, sowing, reaping, winnowing, &c. &c.

23. All other persons possessing ground, are obliged to pay a certain fluctuating tribute to the governor, according to the will and option of that great officer of the state, in grain, honey, farm-stock, cloth, or salt pieces; and as his majesty besides taking from his governor as an inauguration fee from four to six hundred crowns, is (unless presents are frequently and voluntarily made) continually sending for cattle, and honey, and sheep, in quantities, these offerings fall hard upon all classes; for should the governor give entirely from his own means, he would find himself soon totally impoverished; and should he tax the people too roughly in the preparation of this gift, complaints would invariably reach the royal ear, which are certain to strip the offender of his government and remaining property.

24. The fields are not measured, but merely divided by means of small ditches and stones, and on the face of the mountains are generally of so diminutive a size, that it has been found necessary to enact an ordinance regarding the accidental falling of seed upon a neighbour's field, and it has been decreed by the king, that such being the will of Providence, no squabbling, nor disturbance shall henceforward take place, but that each shall enjoy in peace what is found in his own

field. Hedges are unknown, except in a few of the greatest thoroughfares to enclose and render more impassable the muddy lanes; and the boundaries in pasture land are simply marked by large stones erected apart at great intervals.

25. In consequence of this want of enslosure animals are continually trespassing among the grain, and the regulations on this point are clearly defined and stricly adhered to. If the stray animal be a horse or a mule, the bridle is the forfeit; if a donkey, a dowla of grain must be paid; and if a goat or sheep, one of the legs being tied up, the animal is carried before the governor, who ascertains the damage, and the proprietor is compelled to pay the exact amount of destruction, called *affelama*, being moreover obliged to swear by the king's life, that the animal shall in future be kept in due restraint.

26. The process of paring and burning is in general practice, without reference to the quantity or quality of the soil, a portion of which by this operation, becomes reduced to ashes. The ashes in some situations, and in the absence of extended means of conveyance, have certainly the effect of acting favorably as a manure, and besides obtaining in some degree the object of fertilizing the soil the process is also advantageous in destroying the weeds and rubbish. This their only attempt to fatten the soil, is mentioned as being in use in the most ancient recorded system of agriculture,

> "Sæpe etiam steriles incendere profuit agros,
> Cotque levem stipulam crepitantitrio urere flammis."

But the system in modern husbandry has been very nearly exploded as erroneous and inefficacious, except in obstinate bog lands. Shovels and spades are unknown in this land, and the heaps are afterwards scattered over the surface of the ground, by the hands of the village urchins, who may be seen scratching and scraping at the earth like dogs, their utter nakedness being but little concealed by the enveloping cloud of red dust.

27. In all the districts of Shoa, a regular system of cropping has been established, and these rotations of crops are scarcely ever departed from, founded on the principle of preserving the soil from becoming utterly impoverished, and depending also upon the qualities and the diversity of the situations; but altogether indicating the very small advancement made by the Abyssinian in the art of agriculture.

28. In the valleys, teff, jewarree, cotton, oil and wheat follow in succession. On the high country, barley and wheat in alternate seasons, and in the cold moors of the table land, the ground is left fallow for one year to recover itself, before a fresh crop be taken from the exhausted material. Every quality of soil, however, is not adapted to the growth of wheat, nor would the crop arrive at maturity in every situation, owing to the bleakness of the elevation and the tempestuous blasts, fogs, and vapours which cover the crest of these high mountains; and in these districts, peas, beans, and barley form the successive crops.

29. On the table land, the best soil is of a rich brown color, which is found on the sheltered sides of the hills, and the loamy alluvial deposit running along the banks of the river. Black soil is rarely met with on this mountains, and may probably be the decomposition of those forests, which tradition gives as once existing in ancient days, but of which now no other vestige remains. Stones are plentifully spread over the surface of the field to break the fall of the heavy rains, and compact walls are built on every slope, to prevent the soil from being carried away by the impetuous rush of the water.

30. In the valleys, and more especially in the governments of Geddem and Geshe, the richest black soil prevails throughout, and with the aid of a plentiful supply of water, and a mild genial climate, the valleys appear one continuous scene of the most luxurious cultivation of all the produce known in Abyssinia. On the mountain sides the soil is light, loose, and gravelly, and well adapted for the growth of coffee and tea; besides granting a fair return of the various grains which are deposited. Manure is difficult of conveyance, without the convenience of wheel carriages, which are entirely unknown in Shoa, and with the exception of the ashes of the top paring, is seldom applied in common cultivation, as it is fully believed that the cattle and sheep, during their daily pasturage, afford a sufficiency of manure for all practical purposes.

31. Artificial irrigation is resorted to in every situation where a supply of water can be obtained without much trouble, and crops of onions, chillies and gourds are grown in patches by the river sides, where the water can be easily diverted from its bed. The king's farms are in general, from their choice localities, well watered and clearly cultivated; the slopes of the hills are admirably adapted for the

dispersion of the numerous rills which trickle down the mountain side. The valleys in the low country are completely intersected with tiny canals, and the extent of ground, which by a judicious opening of artificial trenches, is watered by these small runnels is surprising.

32. But the divisions of the field are neither neatly made, nor carefully kept in order; there is no levelling of the ground, and no raised banks to enclose the smaller plots, in the preservation of which consists the perfection of this system, and in consequence the water flows very irregularly, entirely floating some of the lower parts of the field, whilst the more elevated are left destitute of the requisite moisture.

33. At all convenient spots where the banks are level with the stream, a few rocks are rudely placed in the water, jutting out a few paces from the bank, and by this simple contrivance, a sufficiency of fluid is diverted from the overflowing stream.

The water-course, which in Amharic is denominated "the water ladder," is elaborately built with loose stones and much and carefully supported in difficult places by wooden buttresses. These canals are built and kept in repair by the united efforts of all who desire benefit to their lands; but the tribute paid to the governor being taken according to the value of the ground, the superior location to the middle class is of no advantage whatever, but merely entails a greater portion of labour.

34. A moderately dry season is reckoned the most favorable for a superabundant crop of wheat and barley, but beans and jewarree, cotton, grain and oil require a plentiful rain. A return from the field of twenty-one times the quantity of deposited seed on the high land, and of thirty-four in the valley, is considered a most excellent crop for wheat, barley and all other grains, with the exception of jewarree; whilst a bad season reduces the produce to ten or twelve in the former, and fifteen or twenty in the latter situation.

35. Abyssinia, however, is happy in a most copious supply of water, (the rains descending twice during the year,) in the flooding of all the rivers and streams, and the complete breaking of the entire earth. The "rain of bounty" commences in February and lasts for one month, and the "rain of covenant," commencing in June, pours down with

extreme violence during July, August, and September, thus affording during twelve months an abundant moisture for two harvests, which the succeeding sun soon brings to maturity.

36. The ground according to universal custom, is ploughed at four different times of the season, and when the sky is cloudy and overcast; the seed is committed to the earth, without the ceremony of harrowing, or otherwise pulverizing the large clods; where the steepness of the mountains prevents the use of bullocks, the ground is broken up with the pick-axe by the hand of the husbandman, but the instruments of culture are of an exceedingly primitive fashion, and the impression made upon the hard baked soil, is of a very imperfect and evanescent nature.

37. The oldest forms of the plough of which we have any description in ancient authors, are very simple indeed; a mere wedge with crooked handle to guide it, and a short beam by which it was drawn, forming the component parts of the entire instrument, and the plough now used in Abyssinia seems to differ very slightly from the old model.

38. This machine, called *airsea*, is extremely rude in its construction, and so slight, that a child might carry it in his arms; the share is of wood and slightly armed with a tiny bit of iron, and it has only one handle or shaft for the guiding hand of the driver; with such an instrument, the peasant is under the necessity of bending almost double, and loading it with his own weight, in order to make any impression whatever upon the soil, otherwise it would glide innocuous over the surface.

39. From the imperfect construction of this quaint and primitive plough, a clean furrow cannot be cut up and turned over, a rugged rut being the utmost effect of the rude instrument: the soil can therefore only be broken by frequent crossing and recrossing the field, and it is evident, that however often traversed by a machine of this sort, the wild roots of any tenacity can never be entirely removed, so that this mode of culture must be always very imperfect, and the necessity of working so many crossings a very great waste of labour indeed. It is no uncommon sight to see on the king's or governor's extensive domains, fifty or a hundred ploughs at work together, and as the fields are never divided into ridges, and neither order nor regu-

larity preserved, the feeble scratching is carried on in every direction wherever the animals can find the requisite room to turn.

40. The pick-axe, called "*domah*," is fashioned from the tough wood of the "Lobinsa," having a crooked head inclining at an angle of 45° towards the shaft, which is straight, and from two to three feet in length; the head of the crook is armed with a heavy piece of sharpened iron, which can be fixed either perpendicularly or horizontally, and transformed at pleasure into a hatchet or a hoe.

41. The sickle, called "*maachet*," is short, slightly curved, with the edge indented, or cut into teeth; it is employed in reaping every description of crop, cutting grass and hay, and even at times used for lopping away branches and bushes.

42. The seed is covered in by one of the light scratchy performances of the plough, which for this purpose is driven rapidly over the field, and during the prevalence of the monsoon, the farmer is employed in ploughing trenches through the wheat fields, to carry off the superabundant moisture. The women and children are fully occupied in hoeing the crops, and keeping them clear of weeds; and whilst the grain is ripening on the ground, a basket-work is erected upon a high tripod in every field, and the ingenious youth of the district are posted on these stages with slings and whips to frighten away the birds during the day-time. When the fields in the vallies are situated near the haunts of elephants, the largest trees are selected, and rude ladders bound along the trunks leading to a place of refuge amongst the branches for the labourer, during the inroads made on the crops by the huge monarch of the forest, who in this country is not easily turned by fires and shouting, and whose displeasure at being disturbed at his meals, is generally manifested by the sacrifice of the intruders.

43. On the crop arriving at maturity, a bundle of grain is cut, and fastened up in an elaborate and handsome form. This is called "*animete*," and is presented as a token of joy to the governor, or to some near relation; the reaping thus commences with every available hand on the farm, female as well as male, and the grain is cut high up in the stalk, the half of which is left attached to the root for the use of the cattle, and the remainder with the ear stored

in piles on the field, for the purpose of being thoroughly dried and hardened in the sun.

44. The threshing out of the wheat, barley and jewarree, is performed in the field by the tramp of muzzled oxen, and the other produce is also cleaned in the open air by means of long crooked sticks wielded by the arms of the sturdy peasants, in as short a time as possible; bread and beer being prepared in great quantities. The farmer hires his immediate neighbours according to his means; hundreds assemble on the spot, the process commences with an uproarious song of exultation, and a most animated scene of noise, labour and confusion ensues, until the grain is entirely separated from the straw. It is strange, that the Jews on their emigration did not introduce into Abyssinia, among their other improvements, the rollers and wheels of wood, and the more perfect system in use at the time in their own country, to facilitate the operations of threshing; but here, as in the earliest days of patriarchal simplicity, the same pristine fashion is preserved.

> "And round and round, with never-wearied pain,
> The trampling steer breaks out the unnumbered grain."

45. After the grain is trodden out, it is winnowed, by throwing it up against the breeze with a wooden ladle, the operation being continued until the pure wheat is entirely separated from the chaff. It is then gathered into a heap, and carried in skins to the dwelling of the owners, to be stored up within the walls of the domicile in wicker baskets and large earthen jars; for a detached barn is nowhere to be seen in Abyssinia belonging to a private individual. The treading floor is usually an open area, well levelled and consolidated with white earth and cow-dung; but notwithstanding this operation, some particles of the earth are often mixed with the grain, which makes the bread gritty and disagreeable.

46. After the wheat is well cleared, it is exposed to the sun on a white skin, for the purpose of completely hardening the pickles, and pounded in a deep narrow wooden mortar, to remove the husk, this operation being performed by two women, who alternately ply their long wooden pestles to the notes of a most monotonous song. The process of grinding the grain is also allotted to the females, as well as that of preparing the bread.

47. The grinding mill is in shape like the shoe worn in the days of Queen Elizabeth. The frame-work, about two feet in height, is composed of wood, straw, and mud, and supports a large smooth slab of stone, inclining at a considerable angle from the heel to the toe. The female stands at the heel of this gigantic slipper, and with a loose fragment of hard rock, held between both her hands, contrives by dint of great personal exertion, and by rocking herself to and fro in a truly uncomfortable position, to bruise the grain into a form somewhat resembling flour, which descends in scanty streams over the toe of the machine, into the vessel placed for its reception.

48. The flour is then mixed with water and yeast, (sour dough macerated in hot-water,) and worked up into large thick cakes, a foot and a half in diameter, which are very carefully covered with the leaves of the plantain. Each cake is then individually enclosed between two earthen pans, a strong fire of charcoal and cow-dung is next heaped about the locomotive oven, and in half an hour the crushed matter is considered ready for use, which a well-fed Indian elephant would most probably reject, with some hint to his keeper, of better baking in future.

49. The foregoing is the most superior bread used by the wealthy classes, and is denominated "*daboo;*" but there are numerous other methods of preparing grain for food, from the mere roasting the pickles, and mixing the different sorts according to the palate of the proprietor, to this grand attempt in the art of bakery, running through all the grades of "*heliot,*" "*anababroo,*" "*anabroot,*" "*deffoo,*" "*amesa,*" "*debeema,*" "*deemookta*" and "*kilta,*" the first four of these being composed of wheaten flour, and the remainder of teff, gram, jewarree, barley, and peas.

50. The various flours used in the preparation of all these cakes being mixed up with water until they form a batter of moderate consistency are poured upon the griddle, somewhat like pancakes, and excepting those made from pea and gram flour, are all spungy and full of eyes, and considerably sour. The natives, however, are not very particular in these preparations, and the grain in a raw state, more especially gram, beans, and barley, appear to satisfy their cravings equally as the most refined method in use.

51. The following table gives the generic English and Amharic

names of forty-three species of grain and useful products at present cultivated in Shoa. Besides supplying their own immediate wants, and those of a herd of clerical drones, who devour the fruits of the working classes, there is still a considerable surplus, which is bartered to the lazy Adaiel for the product of his salt lake, which yields her crop without ploughing or sowing; and were the despotic restrictions but removed from the subject, and a small portion of European knowledge instilled into the minds of the cultivators, the kingdom of Shoa might be made one inexhaustible granary for all the fruits of the earth.

52. Table of useful products, cultivated in Shoa:—

Genera.	*English.*	*Amharic.*
Ervum lens,	Vetch,	Missur.
Cicer arietinum,	Gram,	Shumbra.
Pisum sativum,	Pea,	Allur.
Coriandrum sativum,	Coriander,	Dimbilal.
Sinapis nigra,	Mustard,	Senna fetch.
1. Triticum,	Wheat,	Sendi azazee.
2. "	" 2nd sort,	Aboolsee.
3. "	" 3rd sort,	Zohcongumber.
1. Hordeum hexastichon,	Barley,	Gebs.
2. "	" 2nd sort,	Zujulkupsoo.
3. "	" 3rd sort,	Mooga.
Avena pullens?	Oats,	Gerama.
Poa Abyssinica,	"	Tef.
Vicia faba,	Beans,	Bakkela.
Nicotiana tabaccum,	Tobacco,	Tumbaco.
1. Zea Mais,	Jowarree,	Mashilla.
2. "	"	Waggare.
3. "	White large fruit,	Gorondjo.
4. "	Very long stalk,	Yakkun ehliel.
5. "	Perfectly white,	Tehara kit.
6. "	Mixed red and white,	Kultatoo.
7. "	Red used for making beer,	Zungada.
8. "	Short-stalk large fruit,	Atchara.
9. "	Red used for making beer,	Koliey.
10. "	Fruit hanging on separate threads,	Tattare.

11. Zea Mais, ...	Black, very sweet, ..	Tikureta.
12. "		Effailash.
Linum usitatissimum, ..	Lint, ...	Tulliah.
Carthamus tinctoria, ..	Safflower, ...	Lorf.
" ..	Oil Plant, ...	Noog.
" ..	Ditto, ...	Sulleit.
Musa paradisiaica, ..	Banana, ...	Moos.
Capsicum, ..	Red Pepper, ...	Berberri.
" ..	"	Tameesh.
" ..	"	Geviega.
" ..	"	Unkerdad.
" ..	Small beans, ...	Affdaugooriz.
Citrus medica, ...	Citron, ...	Thuringa.
Citrus, var.	Lime, ...	Loomy.
Cucurbita pepo, ...	Pumkin, ...	Yehburkeel.
Saccharum officinarum,	Larger cane, ...	Shumgool.
Cucurbita lagenaria, ...	Gourd, ...	Khul.
" ..	Used instead of Hops, ..	Gesho.
Coffea Arabica, ...	Coffee, ...	Boon.
Gossypium ——?	Cotton, ...	Till.

53. The sugar cane is planted at any time of the year where water is obtainable, but more particularly in the month of June, before the commencement of the monsoon ; the slips are set in the ground about a foot apart, and are suffered to root and grow up like a bunch of wild seeds. The cane is ripe in the second year, when it is cut over near the ground, and new shoots allowed to spring up from the old stick, which come to maturity after a lapse of two or three seasons. The cane is tall, scraggy, and thin, the joints being closely set to each other, and containing little saccharine juice, owing to the want of skill in cultivation, and to a proper attention to the soil. The cane is used in its natural state, as the manufacture of sugar is entirely unknown in Shoa. It is, however, highly prized, and among the great men, the gift of a very small bundle of sugar-cane is esteemed a great token of love.

54. Tradition gives to the country of Enarea and Caffa the indigenous residence of the coffee plant, spread by the Civet cat over the various localities occupied by the Illoo and Aroose Galla ; it

has flourished for ages in wild profusion over all the mountains, and was thence transported, five hundred years ago, by an enterprising trader to the coast of Arabia. In Shoa Proper, the cultivation is directly interdicted, as savouring too strongly of the abhorred Mahomedan; and although the plant grows strong and healthy in the proper situations, the Christian inhabitant is debarred from this refreshing and valuable produce. In the bordering districts, however, subject to the despot, the restriction is not enforced; the plantations are numerous, and among all the Galla tribes, there is a never-failing supply of the sober berry.

55. Planted before the rains, the seed soon appears above ground, and when six months old, the seedling is transferred to take the place of some old and decayed tree. Water and the manure of sheep are plentifully supplied, and the crop, which from a full bearing tree is generally from thirty to forty pounds, is gathered in March and April. The shrub averages from eight to ten feet in height, the foliage is dark and shining, and the branches are thickly studded with fruit. It takes six years to arrive at full maturity, although producing a slight crop in the second season; it grows luxuriantly in any sheltered situation in the vallies, delighting in the soil which has been gradually washed down from the adjacent heights, produced by a decomposition of the trap rock.

56. The berries are in the first instance of a dark green, which becomes red before pulling, and at the same time, a whitish milky-looking pulp called "*gullabroo,*" fills up the place between the cuticle and seed; after the crop is shaken and gathered from the branches, it is spread out in the sun until the pulp dries upon the berry; the seeds are kept one month in the sun, before being extracted from the pulp, and during the drying operation are never placed in the house, but kept freely ventilated outside; they are afterwards packed in dry leather bags, and carried to the market. The seeds intended for the plantation are retained enclosed in the dry pulp, and are planted by the hand-full in a small plot, which is carefully manured and well-watered. The "*gullaba*" is sold separately from the bean, and is often used mixed with the decoction of the "*chaat.*"

57. The ruler of Hurrur does not suffer any importation of coffee into his own dominions; neither from Shoa nor from the country of

the Gallas. For the better security of his own monopoly in this article at the ports of Zayla and Berberri, the plant is successfully and extensively cultivated ; but the price given at Hurrur is high in comparison with what is paid in Abyssinia, and the average prices demanded for the commodity by the Hurrur merchants at Zayla and Berberri, seem to be exactly those customary at Maysawa in the Red Sea, varying from five pence to seven pence a pound.

58. The impracticable state of the tedious road to the sea coast, the lazy indifferent character of the Danatiel camel owners, who, regardless of the value of time, spend months upon the journey, and the fitful caprice continually displayed by the various chieftains throughout the whole tract which the caravans are necessitated to pass, all form great obstacles to the conveyance of the cheaper produce from Abyssinia, which might, however, be overcome by British power and British perseverance.

59. But according to all collected native reports, in Caffu and Enarea the coffee grows like a weed over the rich surface of the country ; the beverage is in universal use among the inhabitants, the price paid is almost nominal, and the conveyance of water carriage, which may be afforded by means of the great river Gochof, is alone requisite to transport the product to any quantity to every portion of the globe, to the great profit of the speculator, and to the honor of the Government which should carried this beneficial measure into effect.

60. Cotton grows in the sheltered nooks, on the eastern face of the mountains, and in the vallies at the extreme foot of the range ; but from the superior luxuriance of the plant, and the amount of crop which is produced in the valley ground, the natural climate seems to be in those sheltered spots which much resemble, in atmosphere, the more favored parts of Kandeesh and Guzarat. The plant is a shrub which varies in size according to the locality and supply of water, from three feet in height to upwards of seven ; it assumes generally the shape of a pyramid, the lowermost branches extending in width to nearly the entire height of the bush, the leaves are of a large size, the stalk appears more soft and yielding, and the whole appearance of the plant in every situation is more healthy and luxuriant than any of the species I ever saw in India, with the exception of the Bourbon cotton, to which the Abyssinian cotton bears a considerable external

resemblance. In some spots the plant is gigantic, measuring seven, eight, and nine inches in circumference; and the advantages of a very productive crop twice during the year, and the existence of the plant during five seasons, together with the heavy crop of particularly fine wool, even during the first season, give this species a most deserved pre-eminence.

61. The cotton seed is placed for a time in wood ashes, and then well rubbed with red earth before planting, and when the locality is favorable for irrigation, water is invariably given to the plant. There are two kinds, the Gondar species which grows in a spreading dwarfy fashion, and the other that of Efat, which rises tall and straight from the ground, but the seeds of both are planted together in the same field, though the produce is separated in gathering in the crop. The Gondar species is reckoned the superior of the two, the wool being finer and the cloth produced softer and more elastic; but the plant enjoys a shorter existence, as the Efat species remains productive in the ground for four and five years, whilst that of Gondar is exhausted after the third; it is also customary to cut the Efat plant over on the fifth year, close to the ground, which is ploughed up and sown with wheat or other grain, and on the removal of the crop, the young cotton shoots have appeared well above the ground, and produce for two further seasons.

62. The pod when ripe is cut with a knife, the husk immediately taken off, and the wool forthwith deposited in a bag. No dirt is any where discernible, as the pod is cut directly from the tree and great care taken in conveying the cotton wool into the sack. One full bearing bush produces between four and five pounds of raw stuff, twice during the twelve months. The processes of cleaning, teasing, bowing and twisting are entirely performed by the women, who extract the seeds in a house by means of a smooth stone and an iron spindle, which is merely rolled over small portions at a time, the strength of the female arm being sufficient to expel the seeds, without bruising them, or in any way injuring the fibre. A common bow is then used in the process of teasing this wool, and as spinning wheels are unknown in this country, the thread is twisted by means of the ancient spindle, which is the same now in use among the Indian *hammauls* and *brinjarris;* the spinning motion being given by a rapid pressure between the left

palm and naked thigh, whilst the right hand is carried high in the air, for the operation of roving.

63. Where time is not of value, and where the labour of women is held exceedingly cheap, the want of machinery is in a manner supplied by these enduring and hard-working creatures; and although the utmost efforts of a female can but prepare the small quantity of three or four pounds during the day, still the crop is all cleaned in due season, and the manufacture of cloth, though coarse, is exceedingly durable, and at present forms the great staple of exportation from Shoa. At this present juncture when the Government are expending so much treasure to enable the East India merchant to compete with the American in the British market, an extended experiment of the qualities and properties of the Abyssinian cotton might be advantageously made, and it is natural to be supposed, that the result will prove satisfactory, when we consider the greater attention paid to preparing and manuring the soil, the great assimilation of climate, and the mode of gathering in and cleaning the crop at present practised in India.

64. The following is the description of the two cotton plants found in Abyssinia, *Gossypium Gondarense,* seeds sprinkled with short hairs, cotton white; capsules three-celled, three-valved; flowers large, yellow, leaves three-five lobed; lobes commonly obtuse. "*Efatense,*" seeds completely covered with a close down; cotton white, capsules three-celled, three-valved; flowers, small with a red fundus. Leaves three-five lobed. Lobes accuminated.

65. There are two prime sorts of wheat, the white called "*azazee,*" and the red "*zohoon goombar*" (elephant tusk,) which is also the denomination of a species common in Syria; the white is the more prized of the two, possessing the ingredients of a finer flour, easier of digestion, and from its color, being entirely used in the bread of the more wealthy classes.

The red species, however, possesses an exceeding sweet flavor, is the more hardy plant, and grows generally in situations where the white wheat cannot thrive. A third, but inferior species, called "*abolsee*" is cultivated only by the poorer classes of people; of barley also there exists three kinds, but this grain, together with oats, is raised rather for the use of the slaves and farm stock, than as food for the farmer, all other

grain being preferred to this, which when employed for family use, is added in very minute quantities to a large proportion of some other species.*

66. There is no perceptible difference between either the Abyssinian or the various oil plants, and those common in India; the gram is reserved exclusively for the food of man, and used either parched or ground into flour. The seed of the '*loof*' or safflower, besides supplying a fine clear oil, is also prepared for food, and being mixed with the roasted pickles of gram and red wheat, and seasoned with salt, forms the common subsistence called '*kolo*,' which is always taken by the Amhara on his journeys and military expeditions. In the absence of all machinery, the oil is extracted in a very simple manner, although the process is tedious and unprofitable, and of course attended with considerable bodily exertion. The seeds are in the first instance slightly roasted over a slow fire, then pounded in a wooden mortar, and afterwards ground into a pulp on the hand-mill. This consistency is mixed with a modicum of water and boiled in an earthen pot, until the water be entirely absorbed in the operation. The oil remains at the bottom of the vessel, and is refined by repeated strainings through a series of cloths.

67. *Tef* bears much resemblance in its external appearance to rice, and like that plant, delights in low moist hot situations. The color and size of the stalk also, in all its forms and seasons, and the peculiar aspect of the light waving ear further increases the deception; but the grain is very minute indeed in size, oblong in shape, and possesses a pleasant sweet flavor, and as it is one of the most expensive articles of food, it is seldom used individually in the preparation of bread, but mixed with some cheap grain.

68. The *juwarree*, of which twelve sorts are distinguished, reaches the enormous height of 15 and 18 feet, the head is gigantic, and often weighs many pounds, and the natives are fond of chewing the green stalk, the juice of which is agreeably sweet and refreshing. Some of the varieties are used for food, whilst others, and more especially the

* Secale nostrate carent Habessini, panem ex isto factum quum olfacerit Gregorius verum tefum esse, et ipsissimum tefi odorem olere ajebat. Avenam satione indignam censebat, et a suis sperni dicebat. Hordeum enim, vel gramina plicata, equorum ibi pabulum est.—*Sobi Ludolfi Hist. Æth. Lib.* 1. *Ch.* 3 *and* 4.

"*zungada*" and the "*kolye*," are employed solely in the manufacture of beer. The expected produce during a good season, is calculated at eight hundred times the quantity of seed committed to the ground, and a bad season produces half of the above enormous return; but the plant will not grow on the elevated plateaus, and is entirely confined to the vallies below.

69. Beans are eaten raw in the green state, or stored up for use during fast time. They are very inferior in size to the European vegetable, and are invariably of a dusky white color. The plants themselves grow erect to about the height of two feet; the flowers of a white color have dark spots in the centre, and the pods grow upwards in bunches. Peas are used in the same manner as beans. They are sown broad-cast on the field, and are suffered to creep tangled over the surface, without any artificial support whatever.

70. Tobacco thrives well and luxuriantly over all the country, and is cultivated among the enclosures and gardens to a considerable extent, notwithstanding the anathemas of the priests, who having falsely interpreted the words of Jesus Christ, "*That which cometh out of the mouth of a man defileth him*," have interdicted the use of this narcotic, under the penalty of exclusion from the churches. There is a considerable demand, however, among the Moslem part of the population, who are freely addicted to its use, and many of the Christians are even willing to pay the penalty of inhaling the seductive leaf. The seed in Abyssinia is planted during the month of July, and the leaves are ripe for plucking in December. Whilst yet in the green and moist state, they are pounded in a wooden mortar to a perfect paste, and afterwards worked up into small thin squares, like indigo cakes, which are well dried in the sun, amongst a sprinkling of wood ashes; but the tobacco grown at Hurrur, and among the mountains of the Ilto Galla, is cured in the leaf with saltpetre, is of a bright yellow colour, of a remarkably good flavor, resembling the finer sorts raised in Arabia and Persia, and is a great article of import into Shoa. Caravans continually arriving at Alio Amba, laden with this produce from Humur and Churchur,

71. The leaves of the "*gromum*," a gigantic species of very coarse low cabbage, which grows to the height of eight or ten feet, as well as onions, chillies, and a kind of tasteless gourd, are used as articles

of sustenance during the long weary fastings which are strictly imposed on the Abyssinian subject, but are rarely on other occasions produced as adjuncts to the dinner board. The seeds of the *goomum* are thrown about the enclosure before the commencement of the rainy season, and soon afford a supply of green food in the accumulation of filth which encircles every hut, whilst the onions, chillies, and gourds are invariably raised in the immediate vicinity of running streams.

72. The "*chaat*" is a shrub very extensively cultivated in Shoa and the adjacent countries, and is much used by all the inhabitants as a substitute for tea, which it resembles in all its properties and qualities. The affinity in the name with the Hindoostanee term used for the China plant, is passing strange, though many words of the Amharic and Ethiopic, and more particularly the Galla language, seem to possess a common origin. This plant is said to have been originally brought from the western mountains, the elevation of which agree with that of the Chinese tea districts, being from five to eight thousand feet above the level of the sea. The leaves are alone used, either chewed plain, or boiled in milk or water, and sweetened with honey; the qualities and properties are bitter and stimulative, like those of the tea plant, and if used in excess, prevent sleep entirely during the night. The shrub is cultivated in plantations, where the average heat of the year may be about 60° in the shade; although the rays of the sun are very powerful; it thrives best in a light gravelly soil, and grows to the height of twelve feet from the ground. Planted during the month of June, the leaves are plucked during the dry season, and simply exposed on a skin, until well dried in the sun; one pound weight costing from one-penny to two-pence in the bazaar.

73. The diminished import of tea into England has introduced the "*yerba mate*" from Brazil and Paraguay. The virtues of the "*chaat*" are equally to be appreciated; the beverage produced from it by infusion has a pleasant flavour, not unlike some of the eastern teas, and as the plant is said to be indigenous in the countries watered by the "*Gochob,*" it might be found convenient as a medium of exchange for British manufactures. From the following description of the plant it will be seen, that it is of the same family as that used by the lower orders of the Chinese, and that the climate in which the one is produced, is most suitable for the cultivation of the higher flavored,

and more delicate species so prized for foreign exportation. "*Chaat,*" the Abyssinian tea plant, is a shrubby plant known already under the appellation "Celastrus eudules," and belongs to Pentandria monogynia, Linn. and to the natural family of "Celastrineæ," or to that sub-family "Rhamnea" which have in the flower the stamens alternating with the petals. The family Rhamneae; viz the genus Rhamnus, itself supplies a substitute for tea to poor people in China, and is known under the name of Rhamnus theozans. Our plant may be characterized as follows: frutex inermis, foliis oppositis, petiolatis oblongis, servato dentatis glabris. Calys minimus, persistens. Petala, 5 Stamina 5, Petalis alternantia. Fructus superns, oblonga, bacca, 8 locularis, polyspermus vel abortive monospermus. Inflorescentia axillaris-cymosa, cymiredina stipulati. The plant supplying the Paraguay tea is a species of Ilex, and belongs to the same family, Celastrinae, sub order Aquifoliaceæ.

74. The Lime tree grows wild in the forests, and seems to form a favorite morsel for the elephant. It is also cultivated in the gardens, and used by the inhabitants for many culinary purposes, as well as in the preparation of leather, and the cleaning of metals. A species of plantain, resembling in size the horse plantain of India, produces a large description of luscious fruit in great abundance among the vallies, and from the wild species, a stout light cordage is manufactured from the exterior coarse fibres of the stem which rises to the height of eight feet; but the inner fibres are of a very fine texture indeed, and might be used with advantage in the fabrication of stuff for clothing. The Abyssinian flax, however, is of a good quality, although at present only cultivated on the face of the mountains for the sake of the seed, which is large and well filled; the stalk is very short, as no importance whatever is attached to the growth of the plant for other purposes than that of extracting the oil. In a moist spot, the reverse would take place, and from the fine appearance of the seeds it may be presumed, that a lengthy fibre could be very easily produced in the country. Peaches do not attain any size in their present localities; and the vine is only to be met with in some of the gardens belonging to the Abyssinian epicures. There are three kinds, a large red, a very small currant, and a small yellow grape. But the fruit is harsh and sour, it ripens in April, and as no care is taken of the plant in any of

the delicate operations which long experience has proved in all countries to be imperative, the result of the crop is one which might be expected.

75. The grub, called *tempash*, is very destructive to the crops, eating up the roots of the young plants before they have acquired strength and consistency. Baboons exist in numerous colonies, and inflict infinite damage on the surrounding fields; troops of two and three hundred descend upon the grain during the night, and leave but a small remnant for the proprietor. Locusts temporarily wing their flight to these elevated regions, and devour every green herb; and a mildew called "*uramasioo*," blights the hopes of the husbandman, when there happens to be a scarcity of rain. The Galla fly also, which is as large as a bee, abounds;—a great pest to the cattle, stinging them to the effusion of much blood, and causing great pain and bleeding from the puncture; but considering the very indifferent instruments used in the cultivation of the ground, the small advance made in assisting the soil, and the drawbacks just mentioned, the return given is one which could hardly be anticipated.

76. Indeed, the seasons of Abyssinia, as well as the system of cultivation, are truly anomalous. Two monsoons annually pour down their copious floods upon the earth; a plentiful exhalation of dew distils from the moist ground during the night for months after the supply of water has been drained from the skies, and under this vivifying influence, the plants shoot up with amazing luxuriance, refreshed alike by the pure coolness of the morning breeze, and strengthened by the strong heat of the mid-day sun. Two harvests are yearly garnered in by the provident husbandman from the fat land, without its utter exhaustion and impoverishment. Whilst the ripe grain is being reaped from one field, the seed is but just deposited in the next adjacent one; the cattle employed in ploughing up the fertile soil in one location, whilst the muzzled oxen are trampling out its lately yielded treasures in the next; and all the various processes of husbandry, from the breaking up of the ground, to the winnowing of the grain, may be witnessed in one small locality simultaneously.

"Hic ver assiduum, atque alienis mensibus æstas,"
"Bis gravidæ pecudes, bis pomis utilis arbos."

77. Although the keeping bees may not, strictly speaking, come

within the range of agricultural pursuits, yet it appertains in general to rural occupation, and in a country where vinous and spirituous liquors are not in use, much honey is expended in the fabrication of hydromel, and forms a large item in the profits of the farmer. The same customs prevail in this country which have been generally practised since the days of Virgil; the whimsical one of making a confused clamour to induce the swarm to settle, and that of rubbing the interior of the hive with sweet-scented herbs to induce the bees to remain.

78. When the juwarree is ripe in November, long stout seeds covered with the leaves of the sweet smelling *kushus*, mingled with the bruised stocks of other savory herbs, are set in the fields near the habitations of the wild insect, and when the young swarms take their flight from the parent nest, a loud shouting and noise is kept up until a lodgment is made upon one of the lures. The swarm is then shaken into a hive, which is fashioned of long grass in the form of a cylinder, carried to the residency, and suspended from the eaves of the house.

——— "Huc tu jussos asperge sapores,
Trita melisphylla, et cerinthae ignobile gramen.
Tinnitusque cie, et Matris quate cymbala circum,
Ipsæ consident medicatis sedibus."—

79. The hives are robbed of their treasures twice during the year, once in June and again in November; but the queen bee is invariably in the first instance extracted from her dominions, and carefully secured in a reed, and after the remnant of the family has been expelled by means of smoke and the honeycomb despoiled, the hives are plentifully besmeared with sweet herbs, and the queen being restored to her dwelling place, her liege subjects never fail on the following day to return to their plundered homes.

80. Mead formed the nectar of the northern nations, and was celebrated in song by all their bards. It was the drink they expected to quaff in heaven, out of the skulls of their enemies, and was liberally patronized upon earth. In Shoa, it is considered as much too sumptuous for the lip of the common people, and his majesty alone possesses the right and privilege of preparing the highly-prized liquor. Unless brewed with the greatest care and attention, it has a sweet mawkish flavour, particularly disagreeable to the palate, and few strangers can,

in the first instance, relish the composition; but the great recommendation to the native is its power of intoxication, which does not seem to be attended by those after-feelings of disgust concomitant on the free use of other potent liquors, no Amhara of the upper classes ever goes sober to bed, if the means of intoxication be placed within his reach.

81. The branches of the "*gesho*" plant are dried, pounded, and boiled with water, until a strong bitter decoction is produced, which is thus placed in another vessel to cool. Equal quantities of honey and water are then added, and fermentation takes place in three days. Chillies and pepper are next thrown in, and the mixture is shut up in earthen vessels, well closed with mud and cow-dung. The strength increases with the age, and his majesty's cellars are well stocked with jars filled in the days of his father, Hoosun Suggud, thirty years ago, which is little inferior in potency to brandy, and which furnishes the materials for the nightly orgies in the royal palace. In northern Abyssinia, the bitter ingredient is made from the root of the plant "*izade*," from whence is derived the name of the liquor "*iziddy*." It is much more powerful than that made in Shoa, but is not used in such disgusting quantities.

82. The "*boussa*," or beer of the country, also possesses a slight intoxicating quality, and being taken in enormous quantities, produces in the end the desired effect. The leaves and branches of the "*gesho*" are pounded and mixed with water, and the barley or juwaree, being buried for a few days under-ground, until the grain begins to sprout, is bruised and added to the bitter decoction. After fermentation, which takes place in four days, the liquor is closed up in earthen vessels, and is ready for use, according to the temperature of the heat, in ten or fifteen days. The capacity of an Abyssinian to swallow this sour, disagreeable mixture is truly wonderful. Gallons are consumed every evening in every house, and serious rioting, and often-times bloodshed, are the general result of the evening festivity.

83. The Abyssinian breed of horses would be considered in England somewhat undersized, and deficient in make and bone; they are entirely kept for the saddle, the want of roads militating against the use of waggons, and established custom forbids their employment in agricultural purposes. With long shaggy coats from exposure to the seasons,

geldings are alone employed in journey or the foray; the mares and stallions being kept at home exclusively for the sake of breeding. The animals are hardy, enduring, and sure-footed, and from their excessive cheapness, might be exported with advantage to some of our Eastern colonies. Those reared among the Galla tribes are deservedly considered the most superior, the reckless character of those wild riders impelling the colts over the most difficult ground in their youth, and thus during their education, imparting to the animal a degree of boldness and confidence, which is not to be found among the Amhara steeds.

84. The animal intended for the saddle, is castrated on reaching his second year. The opening is made with a sharp knife, and after the operation, actual cautery is freely applied to stop the effusion of blood. Although the practice appears rough, yet very few horses are lost from subsequent disease; and indeed from long use and experience the art of castration has made considerable advance as a science in Abyssinia, every available animal being operated upon by these amateurs, from the hapless Galla prisoner taken in the foray, to the domestic fowl which creeps moping about the farm yard.

85. Horses are never shod, nor is any attention paid to cutting or fashioning the hoof, which being exceedingly hard, for a time bids defiance to all rocks and inequality of ground; but at the end of a long expedition, many of the animals suffer considerably from the want of the farrier. The bridle is particularly severe, and possesses even greater power than the most potent Mahratta bit, long cheek pieces being fixed to an indented bit, which is inserted into the mouth, and secured round the lower jaw by means of an iron ring, which like a tightened curb, acts to the complete restraint of the most violent animal. The saddle is of the Tartar form and fashion, two light boards connected by a high wooden pommel and cantel, leaving an open space for the back bone, and all tightly sown together; a skin covers the construction, and the stirrup irons are very minute indeed, as the toe of the horseman is alone placed in rest during the exercise.

86. The horse is considered a very inferior animal to the mule, whose soft, agreeable pace suits better with the general lazy habits of the Abyssinians, and whose patience and surety of step among the steep rocky mountains are sufficiently appreciated; the prices given

for a mule are consequently higher, and the care taken of the animal proportionally greater. Whilst the horse is allowed to run in his pasture ground during all the seasons of the year, and scantily supplied with old straw, on the failure of the herbage, the mule is fed upon barley and the best '*tef*' fodder; is a continual inmate of the master's dwelling, sheltered from the cold bleak wind, and living on most familiar terms with the other members of the family.

87. Horses and mules are afflicted with few diseases in these Alpine regions; strangles called "*faroo*," and worms in the ear called "*dhadick*," being the only local diseases to be feared. The former is cured by fumigating the nostrils with dung, pea straw and the bark of the "*kolynal*," ("Euphorbia heptagona,") and the latter by the application of oil and the fruit of the "*césso*," which is a most powerful purgative medicine in general use among the natives for the expulsion of the worms which their raw meat diet so freely engenders.

88. The common breed of cattle which cover the plains in great droves, is chiefly of a black colour, with long thick horns, short stout legs, and deep carcases, weighing probably from 250 (two hundred and fifty) to 400 (four hundred) pounds. The "*sanza*," so justly celebrated for his immense horns, is a native of the Galla countries to the northward, and is rarely met with in Shoa, except as curiosities among the royal herds. I have occasionally seen them among the "Kureio Galla," a monastic tribe dwelling in the plains to the south-eastward of Efat. The horns are truly magnificent, stretching up four feet in height, and spreading to a like distance in width between the tips. The animal is of a fine large breed, and has a wild and noble appearance, carrying his well-defended head in a free position, like the stag proud of his twelve tynes.

89. During the rains and spring season, the cattle pick up a plentiful support among the green hills and meadows; but the verdure of Abyssinia is very fleeting; during the dry season the grass becomes completely withered up and destroyed, and many cattle die from the lean herd from sheer lack of pasture, as the grass and straw from the winter fodder is scantily dealt out to the bullocks, and no shelter whatever allowed them from the inclemencies of the weather.

90. The cows, however, are fed on cotton seed, barley, salt and grass, as their milk is a great article of food, and the butter is a valuable

object of traffic. The cream is allowed to settle in an earthen pot, and is stirred up with a stick split at the end into several points, to which a quick rotatory motion is given, between the palms of the hands, and the butter-milk being strained through a cloth, tied over the neck of the vessel, the particles of butter are collected and packed up in a gourd. Being prepared with no attention to cleanliness, soon acquires a rancid smell, which, according to the taste of the inhabitants greatly enhances its value. Besides being used in their culinary purposes, they employ it as pomatum for the hair, and without a plentiful supply of the glistening grease upon their heads, they consider that there is something particularly deficient in their personal appearance and external decorations.

91. The cattle disease is called "*abba sanga,*" the legs swell, the appetite entirely fails, and becoming thinner and thinner, the animal dies. This disease is either infectious or epidemic, and no remedy has been discovered to cure it; but the Amhara soon recruits his droves at the expense of his Galla neighbour. The last military expedition procured an addition of twelve thousand beeves to his majesty's wealth in kine, and a proportional benefit also accrued to his robber subjects.

92. There is some slight attention paid to the comfort of the sheep, which also exist in numerous flocks throughout the country; they are of a small size, without the ponderous tail of fat, and in general are of a black and white colour. In the dry season, they are during the night enclosed in an open pen, but during the prevalence of the rainy weather, they are admitted to the shelter of a roof; for although the hoar frost nightly covers the surface of the land during the months of October, November and December, yet ice is seldom seen. There is plenty of food upon the ground, and the cold does not seem to be so injurious to the flock, as exposure to a continuation of rainy weather. The pregnant ewes are always kept in the house until eight days after the lamb is produced, when they are again permitted to join the flock.

93. The Abyssinian sheep is found in all parts of the country; the ewes are very prolific indeed, lambing twice a year, and having often two or more lambs at a time; and a tolerable supply of grass and salt is stored up for their sustenance, during the season of drought.

The flock is regularly washed in a river once a week for two months previous to shearing, an operation which is performed twice during the year, in June and November, and whilst in this state of preparation, the sheep are kept in a cleanly littered pen. The wool varies considerably in texture, that of some being very coarse, whilst that of others is extremely fine. No care, however, is taken of the quality, but nature is left in this respect, as in all others in this country, to take her own course. The animals are much afflicted with an incurable disease called "*koakoot*," which particularly in the dry season carries off large numbers. The throat swells to an enormous size, and becoming filled with water, the victim expires in a few hours.

94. The long-haired sheep, called "*baala lovisa*," inhabits the high cold countries of Maus, Lako, and the Wolle Galla. The hair is so lengthy, that it reaches the ground on every side, and gives the animal the form and appearance of a large baboon. It is carefully kept in a clean pen, and frequently washed. As the value of this animal is comparatively high, in the event of confinement producing great corpulence one of the legs is broken to reduce the grossness of habit, which is supposed to injure the hair; this coat is of a reddish hue, but afterwards blackened in an artificial manner, and from it the handsome cloaks are fabricated, which are worn by the more wealthy inhabitants of Shoa. Other breeds also of superior size and fleece exist among the Galla tribes, which are highly esteemed at the royal table; but the Abyssinian is not fond of altering the faith or the custom of his forefathers, and the necessity for any improvement in the present small scraggy flock, has not as yet entered the current of his ideas.

95. Goats are considered a very inferior farm stock to sheep; they are subjected to more diseases, and the flesh is supposed (by many of the inhabitants,) to possess the most baneful properties, in proudcing in the human frame the venereal disease. The hides, however, are held in esteem, and the milk is reckoned of utility as an internal remedy during the prevalence of small-pox; whilst at the same time, the eyes of the sufferer are constantly washed and fomented by a warm application. At all other times it is reckoned highly disgraceful to touch the milk of either goats or ewes, or abstract the food from the young animal. The prepared goat skin is soft and pliable, and impervious to water, it

is used for the conveyance of all articles, and its peculiar softness may be attributed to the astringent qualities of the plant "*keemit*," with which it is tanned.

96. On account of the steepness and ruggedness of the ground, the patient ass is chiefly employed in carrying burdens, which are invariably packed up in skins, and roughly tied with thongs on the bare back, producing sores and ulcers during the very first stage. The ass is small, hardy, and very frequently of a piebald color. His lot is the same here as in more favored spots of the globe, having to perform the greatest quantum of labour on the least supply of food possible, and the animal must remain in bondage and dreary work among the mountains, until Amhara courage be sufficiently pitched to attempt the subjection of the elephant, whose strength and docility would point him out to any but such a race, as the animal of burden, reared by nature in these parts for the express purpose of transport. The remainder of the farm stock consists of a few fowls, which are allowed to nestle in the interior of the domicile. Although guinea fowls run wild in every copse, no attempt has ever been made to domesticate this useful breed, and pigs and ducks being held impure by these Jew-Christians, are nowhere to be seen in their reclaimed state.

97. The hay is cut with a sickle in October, before the grass becomes withered, and after being well dried is heaped in stacks on the fields; but although clover, trefoil, and many other nutritious grasses grown wild in many situations, and the natives are fully aware of their nourishing qualities, and confess that it would be most desirable to obtain a permanent supply, yet the coarse meadow grass is allowed to remain in the state, in which nature originally covered the field, affording another striking proof of the slowness with which uncivilized man admits of any improvement when contrary to ancient habit and custom.

98. There is little known or attended to in fattening of cattle for slaughter; those intended for the royal table alone have a portion of salt mixed with their fodder, as also the large breed of Galla sheep kept for the like purpose are for a short time fed on roasted barley; but otherwise, the meanness of the national character is fully displayed in choosing the leanest of the herd for consumption, and the craving of the savage is satisfied by the quantity of raw flesh without any refer-

ence to the qualities of the meat, which, however, may be mainly developed in the different methods of civilized preparations.

99. The following table contains the names of plants and trees which flourish wild in the forests and meadows, but which are gradually disappearing before the axe of the wood-cutter, and the plough of the undiscerning farmer. The endote, the cope, the edible fruits and savoury herbs which now grow unreclaimed in the waste, might, by cultivation, be increased in value and specific quality, and many in their improved state, would serve as a pleasant addition to the Abyssinian diet. But in the absence of precept and example, prejudice and disinclination to alter the customs of his ancestors deters the native from progressing in the arts of civil life, and his social state of existence appears even to have retrograded from ancient times, and more especially in the habit, or necessity, which first induced the use of raw meat as the grand aliment of life. On this point he is truly patriotic, and entertains the most sovereign contempt towards all those who reject uncooked animal food. It is, however, remarkable, how little mankind in general are agreed in the matter of food; for the very Abyssinian devourer of raw flesh would allow the quivering morsel to drop in horror from his lips at the sight of a roasted duck, or a well-cooked piece of pork.

100. Table of useful wild plants:—

Amharic.		*Generic.*
Cosse,	Purgative,	Hygenia Abyssinica.
Endote,	Used as soap,	Glinno, Nov. Spec.
Wanzey,	Fruit, edible,	Cordia Abyssinica.
Injore,	Ditto ditto,	Rubrus pinnatus.
Roshim,	Ditto ditto,	Flacourtia Shoa.
Ajam,	Ditto ditto,	Corissa Shoa.
Lozi,	Ditto ditto,	——— ?
Callao,	Purgative,	Rhammus Shoa.
Cuscusso,	Sweet herb,	——— ?
Ensete,	Plantain,	Musa paradisiaca.
Tete,	Timber tree,	Juniperus excelsa.
Lyba,	Ditto ditto,	Tascus elongata.
Weisa,	Ditto ditto,	
Balm,	Clover,	Thyme.
Mint,		Trefoil.

101. There are few edible sorts to be found wild among the fields; and as in other countries possessing a moist and cold climate, the scanty forests produce no abundance of spontaneous fruits. A variety of grasses, however, and many of a superior quality, vegetate on the meadow land. The root of the ensete is held in high esteem among the neighbouring countries, and more especially in Garague, being scraped and preserved in large quantities in excavations under ground; the bread made from this substance is said to be very sweet and nourishing* The bramble berry, the corinda, and a species of the pear flourish on the eastern face of the mountains; but the remaining varieties of wild fruit may be considered, in their present state, more properly the food of the monkey and other denizens of the wilderness, being insipid and unfit for the sustenance of man. Clover and trefoil, balm and mint, luxuriate wild in all the meadows.

102. The houses are larger than savages in general take the trouble to build, but the low and damp condition of the floor, appears remarkable in a country so liable to cold and rheumatism as the upper parts of Shoa. Instead of their being raised above the level of the surrounding surface, the rocks are invariably scooped away, and the descent of a foot from the outside, leads into the interior of the hovel. The house of the husbandman is composed of wattle and dab, and covered by a grass thatch. It is always fashioned in a circular form, having a closed verandah of from four to eight feet all round; there are four apertures into this from the inside; two which lead out of the house, and two into the dark alcoves which are used as dormitories by the heads of the family. The slaves and inferiors repose in a heap on the floor of the inside apartment, where the fire and the few requisite utensils for kitchen and farm purposes, together with the mule and the hens and chickens, form a very lively group. There is no chimney, and the household furniture must be described negatively; no bed, no table, no chair; these the Abyssinian does not reckon among the necessaries of life, as he can make the earth serve him for all three;

*Sed non sine admiratione dicenda est arbor Ensete, Indicae ficui similis duarum oryziarum crassitie. Nam truncata enumeris tot vicibus sponte renascitur: quæ omnes inessunt ut arbor hic alium fructum proferre opus non habeat: tota enim prodere est. Nam consisa abcocta viliorum hominum famem sedat, qui ut folia conclusa cum farina depsunt, ac pullis inserere dant:—*Sobi Ludolfe Hist Aetheop.*

and altogether, the inhabitant of countries where wholesome air and freedom from vermin are ranked a mong conveniences, must object highly to the want of either, under the roof of the Shoan farmer.

103. There is a dreary look of desertion also in the external appearance of all the lone farm-steadings which are scattered over the country, and the absence of all tidiness and comfort in the arrangement of the yards, as well in the interior of the houses further enhances the picture of desolation. The cattle, the farm stock, and the inhabitants, all reside under the shelter of one roof, not particularly to the comfort or cleanliness of any party. The unseemly dunghill, which in other countries is carried far away to improve the soil and the means of the proprietor, is here suffered to accumulate and rot adjoining the entrance to the dwelling, poisoning the atmosphere with its baneful exhalations, until carried by the descending torrents a few yards from the door, to feed the rank weeds which batten in the filth. There is no attempt at the small trim garden or the neat rustic porch; but bare mud walls and slovenly thatch rise from the midst of a straggling wattle stockade, which completely surrounding the premises, is intended to preserve the inmates from the night attacks of the prowling hyena, but which imparts an idea of utter confinement and misery. There are few trees to break the monotony of this rural scene; no busy hum of glad labour; and the want of bustle and noise among the elders, and the sounds of merry games and amusements among the children, appears to the European visitor, strange, savage, and unnatural.

104. Rough-clad and devoid of every finer art and elegance of life, the original proprietor of the sheep still wears but the raw skin of the animal, which is shifted over the shoulders according to the vicissitudes of the weather; a pair of coarse cotton trowsers, barely reaching to the knees, and a scanty cotton waistcloth summing up the remaining articles of the wardrobe; which, however, is perfectly sufficient for the purpose required as the dearly-beloved coat of rancid fat seems to form a most effectual preventive against the extremes of either heat or cold. If but a small portion of this grease, which is so plentifully besmeared over their Christian persons, was more usefully employed in the fabrication of candles, the long, idle evenings might be passed in a more pleasant and profitable manner,

than in the swilling of beer, like hogs, and in those brawling contentions which at present stigmatize their nocturnal meetings.

105. All sleep stark naked, stretched upon bullock hides, and huddled close together for mutual warmth, covered with coarse black cumlies; and as the use of the candle is but imperfectly known, and the use of oil a royal prerogative, when not carousing at a neighbour's house, they hurry soon to repose, and start with the first call of the cock to lounge idly about the premises. Their fear of wild beasts and evil spirits in some measure tends to restrain individuals after nightfall within their own walls. They will on no account touch food in a dark hut, and unless a fire be lighted, refrain for hours from satisfying their hunger, under the strange superstition, that the devil would otherwise enter in the dark, and that there would be no blessing upon the meal.

106. It is the province of the men to plough, sow, and reap, split the wood, and cut the grass; whilst to the women, all the other heavy work is accorded:— making butter and bread, fetching wood, water, and grass, spinning, pounding, and grinding. When released from his immediate avocations the peasant lounges about the village, sits in conversation at a neighbour's house, and amuses himself with a game called "*gebeta*;" and at other times, attends the markets, which are held weekly in various parts of the kingdom, the funeral feasts, and the groupes which assemble in the public square to narrate scandalous stories.

107. He is obliged to follow to the field his immediate governor in all Military expeditions, under a forfeit of eight pieces of salt (20*d.*) which is strictly enforced. Leave of absence is, however, sometimes obtainable by means of a small bribe in cloth or honey; but unless unavoidably detained, the peasant is at all times ready and willing for the foray, although obliged to furnish arms, conveyance and provision without payment whatever from the State; yet there always exists the chance of being able to capture a slave or a flock of sheep, of obtaining honour in the sight of the king, or of satisfying his brutal, inherent, lust for blood of the heathen Galla.

108. The usual food of the Amhara farmer consists of sour bread made from tef, barley, and wheat, and eaten with a strong decoction of onions, pepper and salt; milk, eggs and butter are much in use, but

meat is seldom provided for family use, though constantly to be had gratis at the "*tescars,*" or public funeral feasts, where cattle are slaughtered and devoured in honour of the deceased, and where any one who choose may be a partaker.

109. There is but little relaxation or amusement for the Abyssinian peasant. 'Seed cake,' and "twice a week roast" form no joyous burden to his song, and as yet no discerning poet has addressed himself to the feelings to render more fortunate the lot of the husbandman. Instead of holiday and feasting, saints' days and fasting are the high festivals in Christian Shoa, half the year being strictly reserved for utter idleness, and sternly marked by an exclusion of all meat diet under the fearful penalty of excommunication. Eggs and butter are especially forbidden, and also milk, which is called the "cow's son." There is nothing whatever eaten on these numerous occasions between sun-rise and sun-set; and even at the appointed time a scanty mess of boiled wheat, dried peas, or the leaves of the cow cabbage, with a little vegetable oil, is alone permitted by the bigotted priesthood.

110. Besides Wednesdays and Fridays throughout the year, which are observed as holydays, the fast of the Apostles continues eighteen days, that of the Holy Virgin sixteen, Christmas seven, Nineveh four, and the fast of Lent fifty-six; during which, working-men are strictly prohibited from all employment, and are obliged to live like anchorites, (to the great diminution of their bodily strength,) if they desire their souls to be saved from eternal damnation. Encouraged and tolerated by the king, there is no system so baneful as that of devoting so many precious and full days of the year to idleness and vice, and none forming a more fatal obstacle to the amelioration of the people. When such an awful waste of time is sanctified by the name of religion, how deeply laid must be the foundation of mental indolence! One-half of the year devoted to listless idleness, is indeed an enormous source of evil. The last generation has not added one particle of knowledge to the ignorance of the former; the same gross superstitions exist, the same prejudices against introducing any improvement or novelty, the same eternal reference to ancestral custom; and thus the Abyssinian peasants live and die without adding one jot to their small portion of wealth, or one item to their narrow stock of knowledge.

111. But although not that earthly paradise which Jesuitical fancy had pourtrayed the country to be, and although the majestic palaces, the pillars of porphyry and the Corinthian domes exist only in the imagination, yet still Abyssinia possesses the fresh vegetation of a northern climate, the vivifying ardor of a tropical sun, and the cloudless azure of a southern sky. The palaces and fanes, the gardens and gushing fountains have departed with Prester John and his glories, yet there still remains a fertile country, with most amazing capabilities, a healthful climate, and a race of beings who, having stopped at the satisfying point "of barren bare necessity," are at least less sensible to that desire for filching so peculiarly evinced by the inhabitants of rich and luxurious cities; and though poor as to the state of the country and arts, the inhabitants remain uncivilized without experiencing much comfort even in their highest enjoyment, and possessing no antidote for sorrow in their debased condition; still the contrast between their existence under an absolute and complete despotism is striking, when compared with that of their neighbours, the Adaiel, who pride themselves on being the free citizens of independent tribes. The Abyssinians are, comparatively speaking, numerous, powerful, and somewhat advanced in the arts and improvements of life; whilst the others are barbarous, idle, improvident, and licentious; and bad therefore as absolute power is in itself, there appears something salutary in any dominion over uncivilized minds, which tends so considerably to the ultimate improvement of the savage.

112. But it cannot be expected that Abyssinia should, for a length of time, take rank among those countries which are peculiarly happy, wealthy or abundant, as all the prevailing customs and practices are at utter variance with the laws for the production, consumption and distribution of wealth. A heavy taxation is enforced on the produce of the field; monastic and clerical establishments are fostered to the ruin of the people; the venal judges are paid by fees on the causes which they decide; and popular superstition and imposture have the royal sanction for abuse; whilst, on the other, not a vestige of aught that might be useful is ever taken into consideration. Here are no roads constructed for the conveyance of produce and traffic; no schools founded for the benefit of the rising generation; and fear and prejudice alike prevent the inhabitants from travelling

to foreign countries to enlighten their ignorant minds by modern invention, or to improve their benighted country by a transfer of modern art and science.

Appendix, No. 1.

Table of prices for farm produce and farm stock in the kingdom of Shoa:—

Quantity.	*Names of Articles.*	*Price.*
36 lbs.	Wheat,	2½*d.* Sterling.
55 lbs.	Barley,	2½*d.* ditto.
60 lbs.	Oats,	2½*d.* ditto.
30 lbs.	Tef,	2½*d.* ditto.
45 lbs.	Juwarree,	2½*d.* ditto.
30 lbs.	Gram,	2½*d.* ditto.
30 lbs.	Peas,	2½*d.* ditto.
25 lbs.	Beans,	2½*d.* ditto.
1 lb.	Coffee,	2½*d.* ditto.
1 lb.	Cotton,	2½*d.* ditto.
1 lb.	Honey,	2½*d.* ditto.
1 lb.	Tobacco,	2½*d.* ditto.
5 lbs.	Mustard,	2½*d.* ditto.
1 lb.	Coriander,	2½*d.* ditto.
5 lbs.	Linseed,	2½*d.* ditto.
10 lbs.	Safflower,	2½*d.* ditto.
7 lbs.	Red Pepper,	2½*d.* ditto.
1 lb.	Onions,	½*d.* ditto.
10 stalks.	Sugar-cane,	2½*d.* ditto.
20	Plantains,	2½*d.* ditto.
4	Citrons,	2½*d.* ditto.
200	Limes,	2½*d.* ditto.
4 lbs.	Milk,	2½*d.* ditto.
1 lb.	Butter,	2½*d.* ditto.
1 lb.	Ghee,	2½*d.* ditto.
1	Bullock Hide,	7½*d.* ditto.
1	Goat or Sheep Skin,	1¾*d.* ditto.

Slaves and Farm Stock.

1 Male Slave, ...	34 to 64 Shillings.
1 Female Slave, ...	48 to 100 ditto.
1 Mule, ...	20 to 60 ditto.
1 Horse, ...	4 to 40 ditto.
1 Ass, ...	4 to 8 ditto.
1 Ox, ...	4 to 12 ditto.
1 Cow, ...	4 to 12 ditto.
1 Sheep, ...	5*d.* to 1 ditto.
1 Goat, ...	6*d.* to 1*s.* 6*d.*
10 Fowls, ...	2*s.* to 2*s.* Sterg.
1 Set of Agricultural Implements, ..	2*s.* 1*d.*

Appendix, No. 2.

Extract on the Agriculture of Abyssinia, translated from the works of *Ludolf, Hist. Aetheop.*

The fertility of the soil in Abyssinia is remarkable, for wherever the ground is fit for culture, it brings forth all manner of fruits. The summer of so long duration being exceedingly conducive to vegetation, sowing and reaping are performed together in one spot, and two, and even three harvests are reaped during the year. The Abyssinians have grain and leguminous plants, not only such as are known with us, but others, such as tef, very useful in making bread, which is unknown in Germany. The seed is very minute, even smaller than that of the poppy, but oblong. They do not seem to possess our corn, for when Gregorius first smelt the bread made from it, he said "this is real tef, and has the like flavour." He thought oats unworthy of cultivation, and said, "it is like darnel, despised by my countrymen," for there barley and grass form the food of the horses. The Abyssinians do not sow for the express food of the domestic animals; as in all the more temperate situations grass is very abundant, on account of the perpetual warmth, and the continual moisture running under ground from the mountains. The solid rock does not absorb the rain water, which sinking under their fertile soil wonderfully refreshes the plants; on the contrary, when the moisture subsides into a rock full of holes, the hills remain sterile.

The meadows are evergreen and redolent of flowers; there is plenty of food for the bees, and for this reason an abundance of honey. With

such a plentiful supply of fruits, they neither spare nor keep aught for the following year, probably because they are confident in the fertility of their soil, or because, as yet they have no sheds for its protection.

Nor are they in the habit of bringing in their hay, although this is highly necessary on many occasions on account of the locusts, for that pest eating up fodder and seed, destroys men and beasts with hunger. Herbs of every kind grow there; not only the sweet smelling and medicinal ones of Europe, but others besides of remarkable properties peculiar to the country. *Amadangda*, as Tully says, heals broken or dislocated bones, the contrary of the *ossifraga* of Norway, which breaks the bones of the cattle treading upon it. But all curiosities in the shape of plants are naught when compared to the *assaffzoe*, which is so efficacious against snake poison, that the most noxious serpents touched with this herb are set at rest, and lay as though they were dead, and even more than this, the shade of the plants stupifies vipers, so that you are able to lift them without harm from the ground; and whoever has eaten of the root of this herb, can walk without fear among hydras, and will for many years be secured from their bites. The Abyssinians are well acquainted with the saffron; grains of it were shewn to us by Gregorius as a curiosity. He said, the expressed oil was useful in hypochondria and obstructions of the milk. They have no hops, but brew beer without this addition. The vines and grapes are excellent, although they make no wine, partly because the grapes ripen in summer when fermentation is hastened by the intense heat, and the must is destroyed. They have plenty of sugar, but no pepper, ginger or other aromatic herbs. Plantains grow there, and I strongly suppose this tree to be the *madragora* of Reuben. Another tree is mentioned by N. Godynius, which is very useful against intestinal worms, for these abound from the habit of eating raw meat; but the Abyssinians purge the belly with the fruit of this tree every month, and in that way destroy the worms.

Appendix No. 3.

List of plants used as medicines in Abyssinia:—

Names of Plants.	*Diseases.*
Ashkak Goomun, ...	Epilepsy.
Weynagooft, ...	Ringworm.
Kurrut, ...	Procuring abortion.

Hoolgub, ...	Sore throats.
Tullinch, ...	Styptic.
Baskimmes, ...	Purgative.
Toolt, ...	Procuring abortion.
Yih vuglat, ...	Fever.
Deet, ...	Fomentation.
Darakoos, ...	Fever.
Indehalaloo, ...	Diseased lungs.
Ekoolkussy, ...	Boils.
Luluffee, ...	Ulcers.
Esadefteru, ...	Cracked skin.
Cosha shella, ..	Rheumatism.
Iccoor tullinch, ..	
Ahia endote, ...	Venereal.
Yemendy roomboy,	Venereal.
Dedhie, ...	
Khut khulla, ..	Ringworm.
Chiffey, ...	
Serabuzzoo, ...	Epilepsy.
Gzimeh, ...	
Kumbo, ...	Epilepsy.
Kuklunggemaro, ..	
Toolulut, ...	Fever.
Chickogole, ...	
Misreth, ...	
Kunchul, ...	Venereal.
Kolkqual, ...	
Amararul, ...	Emetic.
Tuccazzee, ...	
Issagoe, ...	Serpent Bite.
Ahmadmadoo, ...	Sores.
Tucksoe, ...	Fever.
Kuffericho, ...	
Yehzemmerkoos, ..	Aphrodisiacs.
Chifferey, ...	
Dague, ...	
Fula Fedi, ...	Cattle Medicine.
Cosso, ...	Purgative.

Report on the Route from Seersa to Bahawulpore, by Major F. Mackeson, *C. B., B. N. I. Officiating Superintendent Bhutty Territory. Communicated by the Government of India.*

From Major F. Mackeson, C. B. *Officiating Superintendent Bhutty Territory, to* R. N C. Hamilton, *Esq. late Agent to the Governor General, on special Mission to Seersa and Bahawulpore.*

Sir,—I have the honor to submit a map of the route surveyed by me from Seersa to Bahawulpore, with an abstract statement of the different stages. From an impression that your mission would be accompanied by a Surveyor, I took no measures to provide myself with instruments for taking observations for latitude and longitude, the survey has therefore been laid down from bearings with a surveying compass, on distances measured by a perambulator, but no care has been spared on my part to make it as correct as the instruments at my command would admit of.

Abstract.

Submits survey of road through the desert, with list of stages.

2. In submitting this survey I beg to offer a few remarks; first, on the general features of the country traversed; secondly, on the nature and capabilities of the road that has been opened, and on the effect its opening is calculated to have on different channels of commerce.

3. The tract of country traversed from Seersa to Bahawulpore, measures in extent, from east by north to west by south, two hundred and twenty-seven miles. The first forty-three miles are through British territory, the next eighty-seven miles are through the N. E. portion of the Hindoo state of Bikaneer, and the last ninety-seven miles are through the Mussulman principality of Bahawulpore. This tract is not, as has been thought, a desert of deep sand: the heavy sand bears no proportion to the hard soil. From Seersa to Bhatner, though void of large trees, the country near the road is covered with underwood of jhand, karil and ban: beyond Bhatner, the stunted underwood is partial, while bare shifting sand hills on a substrata of hard soil are the common feature. The population is scanty. In the British territory the inhabitants met with, are Bhattis, (Mussulmans,) and Bagri Jats,

General feature of the country—its Inhabitants —Towns.

(Hindoos). In Bikanir, the zemindars are Mussulmans from the Nai, and Bagris from Bagar-des. In Bahawulpore, the prevailing caste is Mussulman. The small towns on the road are inhabited by Hindoo merchants. The chief places are Raneeah in the British territory, a Thana and tahseil station, Bhatner and Sooratgurh in Bikanir, and Maroth in Bahawulpore. Sooratgurh and Maroth are the marts to which the scattered inhabitants of the desert resort to dispose of their produce, chiefly ghee, and to purchase in return the necessaries of life. The principal food of the inhabitants of the desert is bajra.

Tract from Seersa to Sooratgurh described—Its capabilities and prospects of improvement.

4. Between Seersa and Sooratgurh, the country bears traces of having once been well inhabited. At no very distant period, the waters of the Guggur river reached as far as Sooratgurh, and old wells are numerous as far west as Bhatner. A large belt of meadow land, four miles in breadth, extends from Seersa to Sooratgurh, which when flooded by the Guggur, is capable of producing crops of wheat, barley, gram and oats, and after the rainy season, rich crops of rice; while the Rohi or high lands, north and south of it, yield excellent crops of bajra, moot and til. The progress of improvement in this district has been much retarded since it came under British sway, by the unjust system that has prevailed in the Putteala and Kaithat states, of bunding the upper course of the Guggur river, notwithstanding remonstrances from the British authorities running through a twelve years' correspondence. Villages that enjoyed the benefit of the Guggur inundation when under Patteala, have within the last six years, since their transfer to us, been nearly ruined for the want of it; yet it is maintained that no new bunds have been constructed. The above tract has, it is seen, great natural advantages if not unjustly deprived of them, and only requires the introduction of capital, and a more industrious race of cultivators to render it exceedingly valuable. It has suffered much from the disorders following the cessation of regular Government, and from the misrule of its late masters, the predatory Bhattis, who lived by plundering their neighbours. The Bhattis checked in their predatory habits by the strong arm of the British Government, are now slowly, but gradually, being displaced by the more industrious Seikh Jaths and Bagris, and they must either bend to necessity, and become cultivators, or retire with their herds of cattle further into the desert and across the Sutlej.

Tract from the Suratgurh to Bahawulpore described—Its prospects of improvement—Canal proposed.

5. As regards the barren waste extending West from the Suratgurh to Bahawulpore, the prospects of reclaiming it are not very promising; not that it is altogether unproductive, for luxuriant crops of bajra, moot and til are raised on the portions of light sandy soil that occur here and there spread over a substrata of hard clay, but these crops depending entirely on the monsoon, which is uncertain, are subject to frequent failures, and the water to be found in wells is at too great a depth, and too brackish in most places, to be of use either for drinking or agricultural purposes. The measure best calculated to change the face of a large portion of this country would be, the digging a canal from the river Sutlej near Roopur, which should pass South of Bhatinda and Farid Koth, and fall into the forsaken bed of an old river called the Slakro near Bhatner. The line of country this canal would pass through is clear of all the rain torrents from the Himalaya range, and the slope continues favorable to within two marches of Bahawulpore, while the rich soil it would pass through in its upper course, should amply repay the outlay.

Remarkable feature in the country traversed—The deserted bed of a former river called the Slakro Ban.

6. There remains to be noticed one remarkable feature in the country traversed to Bahawulpore, which is the traces that exist in it of the course of some former river: and as it is to the forsaken bed of this river that we are indebted for the opening to us of a road through the desert, I shall venture to give a more particular description of it than it would otherwise deserve. On looking at a map of the desert, we find many scattered hamlets and ponds and wells marked on it, which the people dwelling north and south of the desert may have founded and dug either for watering their cattle at graze, or for the convenience of intercommunication and traffic; but in no part of the desert, save to the road from Seersa to Bahawulpore, shall we observe a continuous line of villages traversing its whole extent from E. by N. to W. by S., and their existence on this road must, I think, be attributed to the facilities afforded for settling by the desert bed of the river beforementioned. All the villages and koths, or forts on the road, which since Maroth, have been constructed within the last thirty years, stand either in or close to this deserted channel, and for the reason that wells dug in it are generally found to have sweet water, while the water

of wells dug at a distance from it either North or South, is usually brackish.

Particular description of the channel of the Slakro Ban.

7. The deserted bed of the river alluded to in the foregoing paragraph is known as far East as Seersa by the name of Slakro Ban, and is pointed out by old inhabitants as distinct from the smaller channels in it, confined within which, the Guggur river now flows. The distinction continues to a few miles West of Raneea, whence to Sooratgurh the whole breadth of Slakro is distinctly marked by numerous elevated sites of villages on its banks, although the banks themselves now appear low and ill-defined. At Bannee, the Slakro is joined by the dry bed of the Wār nāli, and at Mānak, four miles east of Sooratgurh, by the dry bed of the Chittang river. From Sooratgurh to Anopgurh its course is well defined by strongly marked lines of high sand hills; those on the south bank being more conspicuous and uninterrupted than those on the north. After leaving Sooratgurh it bears but the one name of Slakro Ban; the names of its feeders, the Guggur and Chittang, being unknown. From Anopgurh to Chapao and Kalepahar, its banks and course are less easily traced; its bed spreads considerably, and divides into branches, exhibiting large expanses of flat hard soil entirely bare, called by the natives of the country, Chitrang or Duhar, and which, after the sun has risen high above the horizon, have the appearance of sheets of water, displaying all the deceptive and varying images of the *Mirage.* The breadth to which the bed of the Slakro attains at this part of its course is such as to favor the idea that it was a larger river than the Sutlej, which it may have resembled in the lowness of its banks, and in its winding and slow current; opposed to the conclusion of its having ever been a permanent stream, is the fact of its principal known feeders, the Guggur and Chittang, having been ascertained to be merely rain streams, taking their sources from within the lower range of the Himalaya. A glance at the map of the Upper Provinces will, however, shew the numerous streams by which the whole country between the Sutlej and the Jumna is drained off into the bed of the Slakro, and it is possible that some of these streams formerly possessed a more permanent character, and that their sources may not yet have been traced. Even if not permanent, the body of water accumulated in these streams in former years may have been sufficient to have

worked for itself a well-defined channel through the desert, the traces of which still remain. Ages have elapsed since this river ceased to flow, and I shall leave to those who care to prosecute the inquiry, to establish the permanency or otherwise of its character, merely observing here, that from excursions made north and south in the desert to a distance of fifteen miles from the river bed, and a comparison of the face of the country met with, with that in the bed itself, I traced to my entire satisfaction the deserted course of a large river as far as the Kalipahar wells. From that point its course was reported to me to continue on the same W. by S. direction, passing Delawur and other forts in the desert, built on its channel; perhaps joining in the end some forsaken bed of the ever-changing Indus, near where that river empties itself in the ocean.

Description of the road from Seersa to Bahawulpore.

8. The road from Seersa to the wells at Kalipahar, within two marches of Bahawulpore follows the dry bed of the Slakro, conforming to its windings. Its direction is West by South; it sometimes runs in the bed, sometimes crosses it, and sometimes runs parallel with it on the right or left bank, never deviating from one or the other of its banks more than four miles. On a comparison with the average run of marches, it is less heavy for wheel carriages than the road from Kurnaul to Ferozepore, and it would continue good at all seasons. It runs through an open country with little or no cultivation, and may be increased to any breadth; camels may march by it fifty abreast on either side of a column of troops.

Supply of water.

9. The present supply of water from wells would suffice for the passage of a *kafila* of three hundred camels, and we have only to increase the number of wells on the road to admit of large bodies of troops moving by it; with the exception of the stage of Bila-chian the water is every where drinkable and generally good.

Supples of all kinds how procurable.

10. There would be no difficulty as to supplies of all kinds on due notice being given. Such as are not procurable on the road, can be brought to any point on it in two days or less from the Ghara river. Gram for horses is not procurable beyond Raneeah, but barley and moot, or bajra may be substituted. Forage for camels, and grass for bullocks and

horses, may be said to be plentiful throughout the march, unless in seasons of unusual drought. The grass is of a kind that requires to be cut with a sickle, and notice should be given to have it cut and stored, if required for troops. Barley-bhoosa and moot-bhoosa are plentiful as far as Anopgurh, but scarce beyond that stage.

11. *Koss-minars* are now being erected at every two miles, to shew the direction of the road by day: for troops marching at night, it would be well to take the precaution of having fires lighted at intervals of four miles, for the road once lost in the desert is not easily recovered. In the march of troops, the strictest orders should be issued and enforced to secure the few people inhabiting along the road from molestation, and all persons employed as guides, for whom at first a great demand will be made, should be liberally paid and encouraged by kind treatment.

Precautions necessary in marching troops by this road.

12. Whether viewed with reference to the march of troops, or to the dispatch of military stores from the heart of our Upper Provinces at Delhi to Scindh, or to a direct line of dâk from Delhi to Sukkur, the advantages of the new road are too obvious to require to be dwelt on. The saving of time in marching troops by this road instead of by Ferozepore would be ten days, to say nothing of the vast expense which has hitherto attended the dragging of fleets of boats up to Ferozepore from Bahawulpore and Sukkur being avoided, The time saved in the conveyance of the dâk would be upwards of three days. The advantages of the road as a channel of commerce will be separately noticed; meanwhile I may observe, that if it be an object with Government to make the road a thoroughfare, much still requires to be done to improve its resources. A greater number of wells must be dug than will barely suffice to supply the wants of travellers and *kafilas*, and encouragement must be held out to people to settle near them. The practice hitherto in force with the zemindars on the road, of exacting payment at discretion from travellers and *kafilas* for watering cattle at their wells, must be put a stop to. The zemindars should receive an allowance on the duties levied from their own Governments; for without remuneration they cannot be expected to draw water from a great depth for other people's cattle which they re-

Advantages of the direct road from Delhi to Bahawulpore through the desert—much still required to be done to draw forth its capabilities.

quire for their own, while if their exactions continue, the road will not be travelled by merchants.*

The effect the opening of the new road will have upon commerce, and first on the commerce between Bombay, Delhi & Amritsir.

13. I have now to remark on the effect which the opening of the direct road from Delhi through Seersa to Bahawulpore will have upon commerce. This effect can only be fully developed when steam boats plying between Bombay and the Mouth of the Indus, and hence to Bhawulpore, shall have rendered the transport of European manufactures and other articles of commerce by that channel both safe and expeditious. We may then expect, from a comparison with the various routes by which the products and manufactures of Europe reach the great marts in the Upper Provinces and in the Punjaub, that the route from Bombay to Bahawulpore by water, and thence by land through Seersa to Delhi, will have the advantage over all others in rapidity of communication and in other respects. In point of safety, it is now much to be preferred to the long land route traversed by *kafilas* from Bombay via Pali to Bhiana and Amritsir, which is seldom free from the apprehension of plunderers. The trade from Bombay by the river route to Bahawulpore, and to the countries North-east of that mart, has hitherto been trifling in amount, a circumstance that may be accounted for by the unsettled state of the countries West of the Indus, since that river was opened in 1832, and by the natural difficulties of the upward navigation of the rivers with the unskilful en-

* Several *kafilas* returning from Delhi within the last month, have gone from Seersa round by Abohar, and along the left bank of the Sutlej to Bahawulpore, alleging as their reason for not taking the direct road through the desert, their fear of exactions from zemindars for watering their cattle. The chief advantage of the desert road for *kafilas* is its directness. The duty levied on it is 8 annas per camel more than by the circuitous route on which the Bikanir territory is avoided. Add to this, that forage though not scarce in the desert road, is more abundant in the circuitous road, as is water; and when we consider how little it requires in the shape of exaction or obstruction to turn trade off its direct channel, it is obvious that the road through the desert must be cleared from all obstacles of this nature before it can successfully contend with roads possessing greater natural advantages, even when all has been done for it, that can be done. Part of the traffic from Afghanistan that would otherwise have come by it, may now since our acquisition of territory at Asafwalla on the Ghara, cross to that place direct from Multan by Pukputtan; thus avoiding the duties to be paid in the Bahawulpore and Bikanir states. At present, however, the duties between Multan and Pukputtan are much heavier than they are between Multan and Seersa by Bahawulpore.

terprize of native merchants unused to the risks of water-carriage. Early in 1836, a firm of our merchants established at Bahawulpore, opened a commercial intercourse with Bombay by the river route; but meeting with some loss from the sinking of a cargo on the outset, they for a time suspended their transactions. For the last three years, however, this firm has annually got up an investment of three boat-loads of goods from Bombay, consisting of Europe long cloths, *(suphedi,)* bars and sheets of iron, spices, cocoanuts, &c.; but they shew a great want of enterprize in selecting for their voyage the season when the river is at its lowest, where there is less risk, and they can load their boats heavily. The consequence is, that their voyage from Bombay to Bahawulpore occupies seven months. They lose the advantage of being first in the market, and much of their profit is eaten up by the wages of boatmen. Goomsai Ram Seth of Luchmungurh, who has branch firms at Seersa and at Bombay, has now sent for an experimental cargo from Bombay, in order to prove in how short a time goods shipped at Bombay, and brought up the river in boats lightly laden, and taking advantage of the season of favorable winds, can be landed at Bahawulpore, and conveyed thence to the markets at Bhiana and Delhi. Should the result of his venture be favorable, his example will no doubt have many followers, and we shall in course of time see this channel of commerce vie with that from Calcutta to Delhi, and in a great measure supersede the long and expensive land route from Bombay via Pali.

2dly. On the Commerce between the marts of Seersa and Bahawulpore.

14. Of the traffic created between the marts of Bahawulpore and Seersa by the opening of the new road, I have little to say. In the outset, the Seersa merchants anticipated a great demand for the groceries which they bring from near Shamli, and export Westwards. Their anticipations have not been realized. The consumption at Bahawulpore itself is not very great, and that place is already well supplied by the channel of the Sutlej, from Lodiana and the Jalindar Dooab; and when our merchants would have sent on their investments to Sukkur where a demand for them existed, they discovered that the heavy duties they would have to pay in clearing out of Bahawulpore, would leave them little or no profit on the investments. To avoid these ruinous duties, they are now put to the inconvenience of sending their goods outside of Bahawulpore to the river side, and there keeping them

until they can hire a boat to take them on to Sukkur; and yet in spite of this drawback my impression is, that when bullock carts come to be used instead of camels on the new road, it may successfully compete with the river route in supplying Upper Scindh with the groceries and drugs in demand there, which can be procured cheaper, and of better quality from the eastward of Seersa, than from the neighbourhood of Loodhiana and Jalindar. The Seersa merchants will also have the advantage of bringing back a return cargo, thus making two profits when the river-going trade only yields one. In addition to sugar, molasses, cotton, and other groceries, the Seersa merchants should be able to export to Bahawulpore the indigo grown about Hansi, which is of superior quality to that now purchased by the Lohani merchants at Bahawulpore and Shudabad for export to the western markets.

15. Another branch of trade that will be more immediately affected by the opening of the new route, is that from Affghanistan to India carried on by the Lohanis. This is so well known, that a detailed account of it is not requisite. The number of camels laden with merchandize that annually pass through Dera Ismael Khan towards India, led by these enterprizing traders, has been estimated at 7,000. Those who bring horses, are compelled by the Sikh government to take the road to Lahore; very few of them come by Multan and Bahawulpore. Those who bring green and dried fruits, madder, assafœtida, and other merchandize, find their way to our frontier from numerous directions, driven by exactions into circuitous routes, and travelling any distance, and undergoing any hardships, rather than pay duties. Besides the Lohani *kafilas* engaged in this trade, there are *kafilas* belonging to Mooltan Affghans, amounting to about 700 camels, that go annually to Candahar, and as far as Lucknow and Cawnpore in our provinces. There are also merchants at Bahawulpore and at Sawulghur in the desert, whose camels, 300 in number, ply between Dera Ismael Khan, Jang Mani, Multan and our provinces, making journies later in the season, and purchasing the goods they import from the Lohanis. The reduction of the duties in the Bahawulpore and Bikanir states, followed up by the removal of all difficulties in the supply of water to caravans, should have the effect of concentrating in the new road a great part of the trade above described; and the Lohanis freed in a great measure from former exactions,

3dly. On the Commerce between Affghanistan and India.

should be able considerably to increase the amount of their imports and exports.

16. It has been suggested, that the opening of the direct road across the desert, would enable the Lohanis to make two journies to India instead of one. The time saved affords no ground for such an expectation, nor is it possible in their present mode of travelling; for they can only cross the Suliman range with their families previous to, or after, the heavy falls of snow, and they must leave their families to spend the depth of winter in Damoun, that is on this side the Passes; but if it has not effected what was impracticable, as a measure facilitating the access of the Lohanis to our marts and the supply of their wants, the opening of a direct road, together with the reduction of duties through two of the three foreign states intervening between Affghanistan and India, must be admitted to have effected much for commerce between those countries. Much eventual benefit will I am persuaded also arise from this measure to the trade between Bombay and the marts of Upper India and the Punjab; and if I might be permitted to suggest a further measure by which commerce by these two channels might be promoted, it should be the revival of an old proposition for the establishment of a mart or annual fair at a convenient position on the frontier, at which the merchants from Affghanistan, from Hindoostan, and from Bombay, might meet and exchange their goods free from the vexatious exactions practised by native governments.

With the reference to the wants of Commerce on the channels above described, suggests the establishment of a mart or annual fair on the frontier.

The inconvenience suffered by our merchants trading between Seersa and Upper Scinde, from the want of an intermediate mart at which they might store or dispose of their goods free of exorbitant duties has been already noticed, and this inconvenience would be more severely felt should the Bombay trade with Delhi and Amritsir follow the new channel. As regards the effect of a mart or fair in the Lohani trade, it may be remarked, that though generally the Lohanis are indifferent to the distance they have to travel to supply their wants, there are many of them, even now, who find it their interest to dispose of their goods at marts nearer home, where they have to pay heavy duties, and their wants are but indifferently supplied. Many of them who cross the Suliman range with the last *kafila* of the season, may wish to

return with the first, and will dispose of their goods at Deera Ismael Khan, at Multan and at Bahawulpore, as has been observed, to the merchants of those places, rather than undertake a long march into Hindoostan. Others again, whose wants are supplied at Jang Miani, Multan, Shujabad and Bahawulpore, never come beyond those marts. At Jang Miani, after disposing of their own goods, they purchase large quantities of a particularly strong coarse cloth, resembling *dosooti*, which, dyed in indigo, is the common wear of the Affghan peasantry. At Shujabad, they purchase indigo, and at Multan and Bahawulpore indigo and coarse chintz, which are exported to Bokhara. It is therefore obvious, that were a mart once established in a convenient locality on the frontier, where no duties should be levied, the number of Lohanis who would dispose of their goods there instead of coming on to India, would be much increased, indeed that the number might be expected to increase in proportion to the ability of our merchants to supply their wants.

17. Should the foregoing remarks dispose you to view the establishment of a mart as a practical object deserving of encouragement, it will not be difficult to determine its position. The town of Bahawulpore, or a site in its immediate neighbourhood, would unite advantages that could not be found in any other place. It is situated both on the high road of the trade from Affghanistan to India, and on what promises at no distant period, and with due encouragement, to become the high road of trade from Bombay to Delhi, or from Europe to the marts in Upper India. It is moreover easily accessible from the capitals of Rajpootana, from Delhi, and from Amritsir, and is near to Multan, itself a great mart.

Proposes Bahawulpore as the best position for the mart.

18. In conclusion, as connected with the subjects adverted to in this letter, I beg to draw your attention to the annexed tabular statement obtained from the Government Native Agent at Bahawulpore, shewing the increase of trade in the rivers Sutlej and Indus, since the opening of those rivers early in 1833. It will be seen, that in the first year the number of boats that descended the river was four, laden with 2700 maunds of merchandize, which, I may observe by the way, was sold at a dead loss, owing to the obstacles opposed to our merchants by the jealous fears of the Ameers of Scindh. In

Submits a short tabular statement.

Of increase o traffic on the rivers Sutlej and Indus above Sukkur, from 1833 to 1843.

the last year, 1843, the number of boats is stated at 1125, and the quantity of merchandize at 2,14,416 maunds. All the 1125 boats, save the three alluded to in a former part of this letter as bringing cargoes from Bombay up the Indus, are downward-going boats, engaged in carrying groceries and drugs from near Ferozepore and Lodiana, and grain from near Sutpore and Mithankote to Scindh. It must be admitted, that the greater portion of the 2,14,416 maunds of merchandize so-called is grain, the demand for which in Scindh arises from the presence there of a large body of our troops; that the trade up the rivers from Bombay is at present trifling; that the population on the rivers is too scanty and too poor to be able for many years to come to purchase any quantity of our Europe manufactures; but I would still draw your attention to the general progress of traffic on the rivers. In 1833, on the course of the Sutlej and Ghara from Loodiana to near Bahawulpore, there were no boats but one or two at each of the ferries, ten or twelve miles apart, used for crossing the river. The use of oars and masts and sails was unknown, and a voyage down or up the river to any distance unheard of. We now see the boatmen of the upper course of the Gharra and Sutlej become expert sailors, and making a voyage to Sukkur and back is a common occurrence, while the actual number of boats between Loodiana and Sukkur has increased from 250 to upwards of 750. These are results which appear to me to justify our entertaining sanguine hopes of one day seeing the neglected rivers to the N. W. of the Indian Continent vie with those to the East, as channels of commerce and civilization.

I have, &c.

(Signed) F. Mackeson,

Pol. Dept. Supt. Office, *Off. Supt. Bhutteeana.*

Bhuttee Territory, Seersa, 15th April, 1844.

Territory.	Civil Authorities.	Names of Stages.	No. of Houses.	No. of Shops.	Distance. Miles.	Furls.	Yards.	Road.	Rivers.	Tanks.	Wells, Pucka & Kucha. No.	Depths of Wells. Water below surface. (Cubits.)	Water in well. (Cubits.)	Intermediate Villages.
British.	Superintendent, Bhuttee Territory at Seersa.	Sirsa, ...	a town	..	..	..	..	..	..	....	..	60	10	Dhemoor on the Cuggur, large jheel.
		Raneea, ...	400	20	12	7	9	good.	..	1 large tank.	5 p.	70	5	Water of wells slightly brackish. Jugmullerah, 40 houses, 3 k. wells, 1 tank, water 80 cubits. Kunjurnallah, 2 kucha wells, 15 houses.
		Bunnee,..	40	2	14	2	100	good, rather heavy.	..	2	1 p.	..	..	Water sweet. Soorewalla, 2 pucka wells, one out of order, 1 tank, 20 houses, grove of trees. There is a hard road to Bhutnere from this via Peerkamreea, distance 13 and 17.
		Teebee, ...	50	1	8	4	30	sandy first part.	..	kucha tanks.	5 p. one in use.	..	..	Water sweet. Mussanee 1 pucka well, 1 kucha tank, 20 houses. Sereka, 1 pucka well, 2 kucha out of order, 70 houses. Kumranee, 1 kucha well, 1 tank, 15 houses. (Water sweet.)

Route from Seersa to Bahawulpore,—(Continued.)

Territory.	Civil Authorities.	Names of Stages.	No. of Houses.	No. of Shops.	Distance. Miles.	Furls.	Yards.	Road.	Rivers.	Tanks.	Wells, Pucka & Kucha. No.	Depths of Wells. Water below surface.	Water in wells.	Intermediate Villages.
												Cubits.		
Raja of Bickuneer's Territory.	Governor General's Agent in Rajpootana at Ajmere.	Bhutnere, ...	200	100 open	10	6	180	Sandy at starting, good.	..	1 1 Tank, the largest on the road down, retains water throughout the year.	52 p. 5 in use.	100	6	A fort, 52 bastions, water sweet. Site of village, (deserted.) Ditto, Mustnath site. Ramser, 2 furlongs of road to S. 10 houses, 1 kucha well, 1 tank. Futtyghur, 25 houses, 1 p. well out of repair, 2 k., water at 100 cubits. Dhinganah, 2 houses. Subjeepoorah, 4 houses inhabited, 1 kucha tank. Buhlolungur, 2 houses inhabited, 1 kucha well, sweet water. Kalee Bunga, 5 houses, 1 k. well in ruins, water sweet, site of a vill. *Note.*—Dablee, a village 8 miles and 6 furlongs from Bhutnere north of Futtyghur, and about 4 miles distant from this road, has 15 houses and 9 pucka wells of drinkable water, and a tank. Gharees sometimes take this road from Bhutnere to Dablee, and thence to Kalee Bunga and Loodhana.

Route from Seersa to Bahawulpore,—(Continued.)

Territory.	Civil Authorities.	Names of Stages.	No. of Houses.	No. of Shops.	Distance. Miles.	Furls.	Yards.	Road.	River.	Tanks.	Wells, Pucka & Kucha. No.	Depths of Wells. Water below surface. / Water in wells. (Cubits.)		Intermediate Villages.
Raja of Bickuneer's Territory.	Governor General's Agent in Rajpootana at Ajmere.	Peelee Bunga, ..	7	..	16	6	120	good.	..	1 small tank.	1 k.	102	..	Water in well sweet. Loodhana, 20 houses, has a large tank, 1 pucka well of good water, 90 cubits from surface.
		Soorutghur, ...	1300	150 shops of kinds.	14	7	120	good.	..	2 tanks, one of which retains water the whole year.	5 p.	86	5	Wells large and water plentiful. Sheopoorah, 15 houses. Nekonah deserted.
		Sirdarghur, ...	41	3	9	5	40	good.	..	1	2k. 1p.	80	..	Water good.
		Belocheea, ...	11	2	19	7	20	good.	..	1	1 k.	81	$3\frac{1}{2}$	Well water very brackish and deficient in quantity. In the straight road over the sand, 2 villages on the road. Dubyal and Roopnasur, the latter 4 houses. Rahur.
		Anoopghur, ...	220	5 open	17	3	200	good, last heavy.	..	....	7 p.	83	$3\frac{1}{2}$	Water good. Site of a village. Boundary of Bahawulpore territory.

A 2

Route from Seersa to Bahawulpore,—(Concluded.)

Territory.	Civil Authorities.	Names of Stages.	No. of Houses.	No. of shops.	Distance. Miles.	Furls.	Yards.	Road.	River.	Tanks.	Wells, Pucka and Kucha. No.	Depths of Wells. Water below surface.	Water in wells.	Intermediate Villages.
												Cubits.		
Nawab of Bhawulpore's Territory.		Hullur or Sirdarghur, ..	100	4	12	..	..	good	..	....	2 p.	76	4	Water good.
		Pholera, ...	400	20	11	6	180	good generally.	..	2 tanks nearly filled up with sand.	4 p.	70	4	Tibah khansur or site of a village. Good water.
		Meerghur, ...	20	4	15	..	..	good.	..	....	1p. 4k.	56	4	Water very drinkable.
		Maroot, ...	250	40	11	6	120	good.	..	....	13 p.	43	6	Jamghur, deserted, a tank and a well, water bad and brackish from not being drawn. Water good and plentiful.
		Chappoo, ...	10	..	9	6	100	good.	..	....	3 k.	40	3	Slightly brackish, a pucka well building by the Nawab.
		Kalleepoor, ...	..	..	12	7	140	Here and there scarcely.	..	....	1p. 3k.	32	4	Do. do. built by the Nawab.
		Pawarewalla, ..	40	..	15	4	80	Heavy full miles last half.	..	....	5 k.	23	5	Sweet water, ditto.
		Bahawulpore, ..	..	..	13	3	50	good.	..	....	..	..	..	Hummutee, 40 houses, 15 wells, 12 kucha 3 pucka, sweet water at 12 cubits below the surface.

(Signed) F. Mackeson, *Officiating Superintendent.*

Statement of number of Boats laden with Merchandise and with quantity of ditto, which have passed down and up the rivers Sutlej and Indus, from Loodeeana, Ferozepore, Bahawulpore, Mithenkote to Sukkur and back, and in each year from A. D. 1833 *to* 1843.

Year.	No. of Boats.	Quantity of Merchandise. M.	S.	C.
From January to December, 1833, ...	4	2,700	0	0
From January to December, 1834, ...	3	2,200	0	0
From January to December, 1835, ...	7	5,800	0	0
From January to December, 1836, ...	9	6,800	0	0
From January to December, 1837, ...	11	8,700	0	0
From January to December, 1838, ...	20	11,000	0	0
From January to December, 1839, ...	350	1,97,525	0	0
From January to December, 1840, ...	500	1,99,764	0	0
From January to December, 1841, ...	650	2,40,476	0	0
From January to December, 1842, ...	495	2,17,385	6	0
From January to December, 1843, ...	1125	2,44,416	0	0

(Signed) F. Mackeson,
Officiating Superintendent.

Note on a recent Fossil Fresh-water Deposit in Southern India, with a few remarks on the origin and age of the Kunker, and on the supposed decrease of Thermal Temperature in India. By Capt. Newbold, *M. N. I. Assistant Resident, Kurnool, Madras Territory.*

The geographical locality of this deposit is in the Kurnool territory, about a mile easterly from the village of Lunjabunda, in about latitude N. 15° 30′ and longitude E. 78° 3′.

It lies in a jungly defile, or transverse valley, crossing the range of hills which, running nearly N. by E. and S. by W. divides Kurnool into two portions. This range commences about five miles S. of the city, and after traversing the whole length of the Kurnool territory, passes below the Zurairoo valley, to the E. of Gooty, where it is connected with the Cuddapah chains, which, curving easterly, terminate near the coast in the Naggery ranges.

These ranges consist principally of the diamond-sandstone and limestone, and comprise within their area the diamond mines of Condapetta, Chinnoor, Ovalumpully, Munimudgoo, Banganpilly, Ramulacota, and others of less note. The fossil deposit rests on this sandstone conglomerate, which at no great distance is seen reposing on granite, with a dip of 10° to the S. of E.

A little to the E. of this, the diamond limestone intervenes between the granite and sandstone, underlying the latter in conformable dip and stratification.

A spring rising from the foot of a mound of conglomerate, composed of fragments of the sandstone rocks cemented by kunker, marks the site of the fossil bed, which lies in a slight depression above this mound, and considerably out of the reach of the spring in its present state. It is only a few yards in extent, and has evidently been deposited by the spring under former conditions, to which I shall allude presently. The imbedding matter is also a kunker, but one of a much harder, compact, and siliceous nature than that at present seen around the margin of the spring, and below the mud at the bottom. Portions of it are sometimes so siliceous, as to give fire with steel and scratch glass; other portions of the rock contain more lime, are less compact, and effervesce freely with acids. The colour is a light brownish-grey; fracture varying from flat-conchoidal to earthy.

The shells imbedded are fresh-water, principally *melania*, with a few small *planorbes*, and are all of existing *genera*. The number of the former is so proportionally great, as to excite surprise in persons who have not studied the segregarious habits of the inhabitants of fresh-water and terrestrial shells. Besides the shells there are impressions and casts of the stems of grasses, reeds, &c. perfectly fossilized by carbonate of lime.

The shells afford instructive examples of the various stages of fossilization. Some of their coats have been completely converted into sparry carbonate of lime; others have been filled with the imbedding paste, which, when the shell is broken off, exhibit a cast with a highly polished exterior. Others again are lined with drusy crystals of quartz; in some, this siliceous crystallization is just beginning to roughen the surface of the interior, and is hardly perceptible without the aid of a lens; thus exhibiting interesting examples of the processes by which fissures in rocks are lined and filled up with minerals which we look in vain for in the enclosing walls; geodes of calcedony and agate, with calc spar and crystals of quartz and zeolite in the midst of calc spar. I have seen a solitary and beautiful pyramidal hexagon of rock crystal, glittering like a diamond in the whitest snow, in a mass of the saccharine marble of Carrara.

None of the shells have lost their carbonic acid, although they have

parted with most of their colour; and some are quite empty as if imbedded but yesterday; most have been evidently entombed in a dead state.

As no trap or other volcanic rock was at hand to account for the silicification of this fresh-water limestone, I proceeded to examine the present deposit of the spring a few yards West of the fossil bed. Its water I discovered to be slightly thermal, having a temperature of 85° 3′ Farht. which is a few degrees above the mean temperature of the spot, isothermally calculated; the height above the sea as roughly approximated by the boiling point of water, is about 1250 feet, and the average temperature of the ordinary wells about 80° Farht.

The present deposit of these waters is a brownish-grey calcareous mud, about six inches thick, mingled with sand, imbedding similar fresh-water shells and a minute specimen of *paludina*. Stems of grasses and leaves were also found in it; some of the latter apparently just decayed, while others are blackened by carbonization; none were fossilized.

Below the mud lay a deposit of nodular kunker, quite distinct in character from that of the fossil bed, being white and earthy, externally pulverulent or chalky, but internally compact and hard. I did not observe any shells or plants in it. The depth of this layer could not be ascertained for want of leisure, and better instruments for digging under water than a geological hammer.

The water of the spring is tasteless, inodorous, and free from gaseous bubbles; and, instead of any free carbonic acid gas, is slightly alkaline, turning reddened litmus paper into a faint greenish blue; oxalate of ammonia, and muriate of baryta produced a considerable white precipitate. That from the muriate of baryta effervesced with dilute nitric acid, shewing the precipitate to be carbonate of lime. A thin slice of gall nut suspended in the water, detected a trace of iron. A minute portion of silica remained after evaporation.

The present layer of mud then, as we have just seen, is more of a mechanical deposit than the subjacent white kunker, which is evidently a chemical precipitate, and concretionary in character, while that which has fossilized the shells and plants, is far more siliceous: so much so indeed, as to resemble in some parts the siliceous tufa deposited by the hot springs of Iceland, more than the common calcareous kunker of India.

The natives declare, that both the volume and heat of these thermal springs, (of which I have within the last two years discovered several in the diamond formation,) are on the decrease. There is no question

that the spring under description is fast drying up, for the *Reddy* of the village pointed out to me land, now waste, which, within the last forty years, had been irrigated by it. It now yields but a scant supply to the cattle and the beasts of the forest. The traditionary accounts of diminishing temperature are by no means so satisfactory, since the Hindoos had no means of measuring warmth or cold.

However, the examination of the deposits in and around the mouth of this spring goes to support what the natives say, assuming that the more siliceous deposit containing the fossils is of an older date than the two at the bottom of the spring, and formed when the spring was more abundant, and its water hot enough to hold a considerable quantity of silica as well as lime in solution, possibly combined. As the heat decreased, the water would lose most of its silica, but still retain the lime; at this period it may be inferred, that the kunker was precipitated as the water cooled on the earth's surface. As the heat still diminished, the portion of lime brought up in solution decreased to the state in which we now see it. That such is the fact appears from the circumstance of the water of two other and warmer springs, which I have since discovered in the same formation, holding considerably more lime in solution than this.

The waters of two other thermal springs in the same formation still deposit lime as a kunkrous incrustation on their sides and on the rocks in their course.

These had a higher temperature; viz. 90° and 91° 3′; the minerals held in solution are similar, but the proportion of lime is greater. One fact is worthy of note, that they were all slightly alkaline, and contained no perceptible free carbonic acid.

In order to ascertain the interesting problem, as indicated by the traditions of natives, and the difference between the quantity and quality of the present and ancient deposits; viz. that the heat of this part of the interior of the globe is decreasing, it would be desirable to keep a register not only of the thermal springs of S. India, but of those far hotter fountains that gush from the great Southern line of dislocation of the Himalayan strata, and the trap hills of Central and Western India.

The heat of the springs might be annually or triennially noted with compared thermometers. After many experiments, I find existing meteorological causes generally affect the temperature of such springs in a sensible degree; and great care should be taken, in

making successive experiments, that the meteorological conditions be as far as possible similar. The time of the year should be the dry season; and the time of day, sun-set and sun-rise.

The plains and valleys of India are often covered with sheets of kunker, sometimes upwards of 70 feet deep, overspreading places where it could never have been deposited by rivers or rivulets; and where now, not a spring or drop of water is to be seen. Along the edges of trap dykes, we occasionally observe mounds of kunker precisely resembling those around the mouths of existing kunker-depositing springs, but we look in vain for the springs that deposited the former.

Still these dwindled remains of springs are generally to be found where kunker prevails at no great depth from the surface, deprived of their heat and of the greater part of their mineral character, which renders the water better adapted for the use of man and animals. Most of the native diggers in boring for a well, consider kunker as almost a sure sign of the vicinity of water. If there can be any doubt after what has been said of the certainty of the vast sheets of kunker at present seen covering waterless plains, and the arid summits of hills of S. India having been formed by springs, many of which are now dried up or diverted, it will be removed on an inspection of a vertical section of the rocks which underlie it. These, whether trap, granite, the hypogene schists, sandstone or limestone, will be found invariably to be penetrated by nearly vertical fissures, through which the kunker appears to rise like trap in a dyke and to overflow the surrounding surface, and like trap, to introduce itself into any horizontal or other seams, imparting the appearance of beds of kunker alternating with gneiss, &c. On a more minute inspection it will be found, that the kunker has in reality been precipitated chemically from the water of springs that now, or formerly, found vent to the surface through these fissures. The thermal waters holding the lime in solution as they cooled in approaching the surface deposited the lime as they ascended.

I had an opportunity in 1840, of studying the formation of travertine in the old volcanic area around Rome, and found it to assimilate that of the Indian kunker in all the leading facts. The calcareous conglomerates at present forming along the shores of the Red Sea and Mediterranean, are little different from the present kunkrous conglomerates of India.

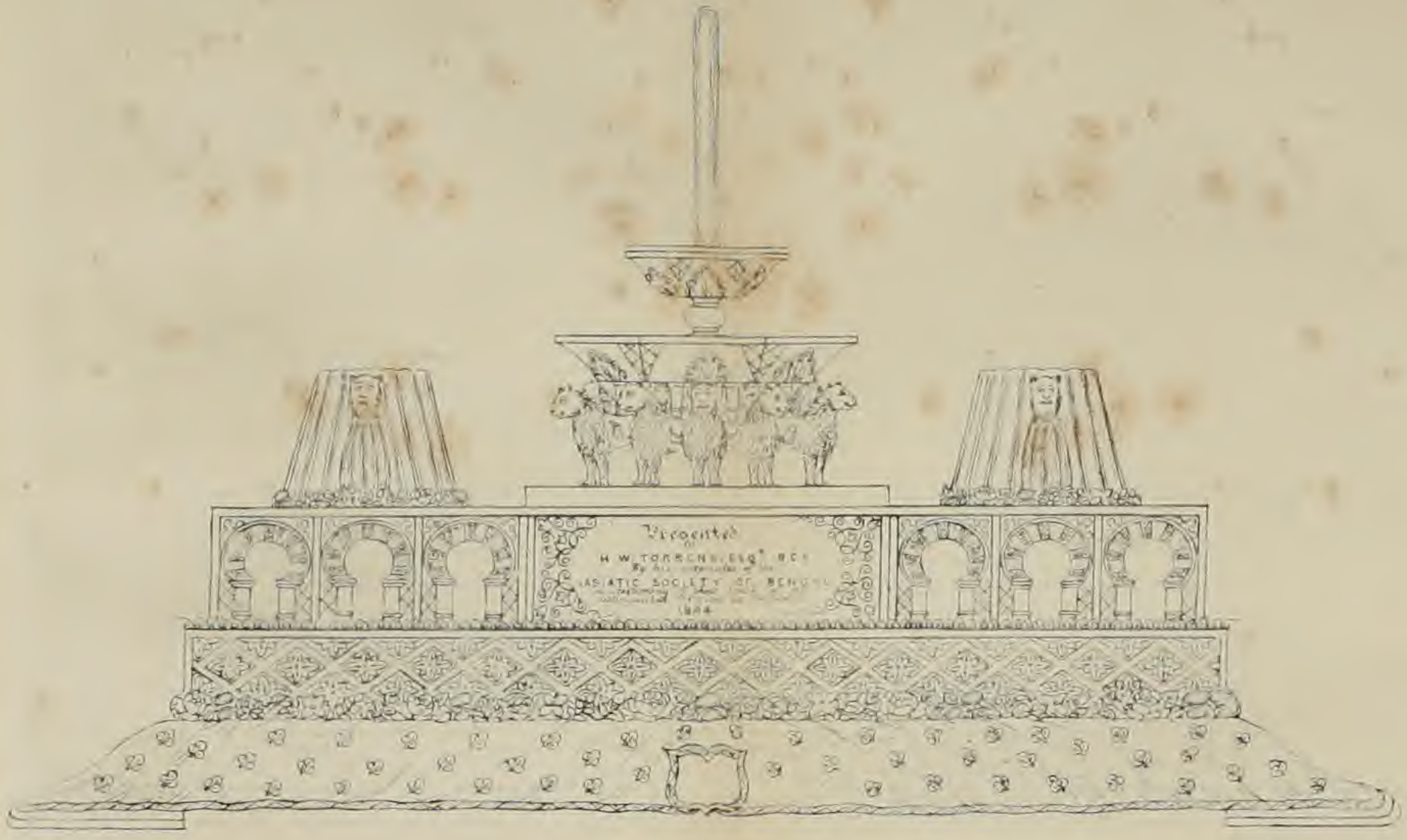
It may also be added, that the surface soils of S. India, whether of the red alluvial, or the black regur, are frequently so strongly impregnated

with muriate and carbonate of soda, as to be utterly unfit for the purposes of agriculture. Many of the springs in such situations are still brackish, holding a portion of these salts in solution ; but are quite inadequate to have caused their diffusion in the superincumbent soil to the present immense amount.

It is difficult to classify a formation still going on, and to fix the period, geologically, when it commenced, as it is seen in all rocks from the granite to alluvium. We have sufficient evidence, however, to divide it into two periods; viz. that immediately prior to the deposition of the regur, which it often underlies in thick beds, and the present formation, going on. The kunker characterized by the remains of the mastodon at Hingoli, and the kunker conglomerate imbedding the mammoth near Nursingapore, like the travertin of Rome, which imbeds the remains of this animal and of existing species of fresh-water shells, may be referred to the post pleiocene period.

Since the discovery of the first fossil bed I have found another near the temple of Hoodelaity on the same range, of considerably greater extent, being more than ten feet thick, resting on the ledge of a precipice thirty feet above the present level of a stream formed by a thermal spring. But not a vestige of the spring that deposited this bed is to be seen. The stems and plants it fossilizes are in a much more distinct and perfect form, and in addition to Melania and Planorbis, I found fragments of Unio, and a shell having the suborbicular shape of Cyrena with the thinness of Cyclas; two forms of fresh-water Conchifer that often pass into each other; the hinge was not visible. A very perfect impression of a leaf, and a number of curious cylindrical bulbiform and reniform bodies, probably vegetable forms, were found. The vertical surface of this cliff presents in its layers all the curved and geodic forms seen in oriental agate, and imbeds solid fragments of a more ancient kunker. The height of the sandstone cliffs forming the sides of the fissure, (probably a fault,) I found, by a trigonometrical observation, to be 75 feet from the bed of the stream.

Specimens of some of the fossil shells, and supposed petrified vegetable forms have been forwarded to the Museum of the Asiatic Society. I have little doubt of the longer and thinner cylindrical bodies being stems of grasses. They are seen in the rock fossilized in clusters upright as they grew, with fresh-water shells half entangled about their roots.



Elevation of the front of the Silver Ink Stand presented by the Asiatic Society of Bengal to H Torrens Esq

3rd April 1844

On Stone by J Bennett 1844

Designed by H Piddington *Printed by P.S.C. Presse's Lt Oriental Lith. Press* *To Silver by Messrs Jacob Brothers & C*

JOURNAL

OF THE

ASIATIC SOCIETY.

Note on the Mijjertheyn Somalees. *By Lieut.* C. J. CRUTTENDEN, *Assistant Political Agent, at Aden.*

The Mijjertheyn Somalees inhabit the tract of country extending from the small port of Bunder Tegadah on the Northern coast of Seef Taweel, a flat belt of land in latitude 6° 30′ N. and longitude 48° 4′ E. (Owen,) on the Eastern side of Africa, where they are bounded by the Hameea tribe. The province of Murregham forms their limit to the South, and the warlike tribes of the Dulbahante and Wursungeli, mark their Western boundary.

The country, generally speaking, is composed of continuous limestone ranges, mostly running E. S. E. and W. N. W., and varying in altitude from 1, 500 to 6,000 feet. In some parts, especially at Bunder Murayah, the mountains near their summits are almost entirely composed of pure white marble; they form naked sheets on which may be seen the "*luban*" or frankincense tree, growing without any visible means of nourishment, or any apparent fissure in the rock to support its roots.

The valleys between these ranges are uniformly well wooded with mimosas and acacias, and exhibit in the rugged water-courses that intersect them, strong proofs of occasional heavy torrents from the hills. An ample supply of pasturage for the flocks is afforded by these valleys during the N. E. monsoon, but during the hot months they are alike destitute of water and grass.

On the extreme Eastern point of Africa, a tract of sandy country extends about nine miles to the North of the range of Jerd Hafoon, (commonly Guardafui,) forming the promontory of Ras Asseyr, which is a limestone cliff perpendicular in its Northern face, and gradually sloping away to the Southward. A few stunted bushes scattered over the sand hills somewhat relieve the eye, and after a few showers of rain, sufficient grass springs up to support a few half-starved goats and sheep. During an excursion that I made up the Jerd Hafoon range, I found the frankincense and gum arabic growing at a very trifling elevation above the sea, certainly not more than 400 feet. At 1,500 feet the dragon's blood tree was found, exactly similar to that of Socotra, and on the summit of the table land, aloes in abundance, with the gum tragacanth, &c.

The tribe apparently know little or nothing of their origin; their traditions indeed give their descent from the noble Arab family of Hasheur, whose grand-son, Jabarti bin Ismail, being obliged to flee from his own country, was wrecked on this coast, and falling in with a fisherman of the Haweea tribe, married his daughter, who with her father embraced the religion of Islam. Their descendants gradually expelled the original tenants of the country, and eventually became masters of the soil.

In speaking of their country, they frequently give it the name of "*Darroad*," which was one of the names of Jabarti bin Ismail, and some two or three houses still exist in Mecca, which the Mijjertheyn affect to consider as peculiarly belonging to the pilgrims from their tribe, on account of their having been erected by their great Arab forefathers.

They repel with scorn the supposition that they were probably at one time a branch of the Galla, but always speak with great complacency of their Arab descent, especially dwelling upon their early acceptance of the tenets of Islam.

This is the only Somalee tribe that I have met with who acknowledge the name of Sultan; and though some years have elapsed since the days when one man governed the entire country, still the title has descended in the direct line of the eldest son, down to its present possessor, a lad of eleven years of age.

As in Arabia, so in this country, the people may be divided into two classes; viz. those who reside at the different Bunders, and employ themselves in trade with India, and the Red Sea; and the Bedouin part of the population, whose only wealth consists in their horses, camels, sheep, &c., and the gums which their mountains produce so abundantly.

Regarding the town's-people, they are precisely the same as the town-Arabs:—the worst specimens of the tribe. Intolerant (from ignorance) in their religion, avaricious to excess, and (if possible) equalling the Dunkali tribe at Tajoora in duplicity and falsehood, they lead a life of utter indolence; their only care being to get a good price for their gums, which the more industrious Bedouin brings from the mountains, and which are carried for them to the Red Sea and Indian markets in *bugalas*, navigated chiefly by Arabs.

We had many opportunities of seeing and judging of this class during our protracted stay on this coast at the wreck of the *Memnon*, and by every one, I think I can safely say, we were more or less deceived.

Though many of them are men of considerable property, they live in the coarsest manner possible; a little *jowari* bread, and a few dates form their common food, varied occasionally by a dish of Mangalore rice and a piece of salt shark. Meat is too valuable amongst them to form a common article of food, but a sheep is generally slaughtered in honor of a guest who may be reasonably supposed to be able and willing to pay for the same by a return present. In the N. E. monsoon they have a tolerable supply of milk, which forms an agreeable addition to their daily fare. They never smoke, but many chew tobacco to excess, and some of them adopt the Dunkali custom of mixing a small quantity of wood ashes with the leaf to increase its pungency.

The Bedouin portion of the tribe are strictly a race of shepherds, with no fixed habitation; and carrying all their worldly goods with them, they much resemble the Arabs of Nejd. The number of their flocks is immense, and they form a large moving population, rarely re-

maining more than three weeks in one place, and regulating their change of pasture so as to leave the table lands untouched until the end of the N. E. monsoon, or about the middle of February, by which time the grass there has become abundant, and if a moderate quantity of rain has fallen, sufficient to last them during the hot season, or about the end of November. They are on an average a mean looking race of men, not to be compared with the Somalees to the Westward, nor have their women much pretension to beauty. The men, generally speaking, are undersized, of slight but compact make, and the fatigue and privation that they will endure without repining is almost incredible. Nominally Mohammedans, hardly one in thirty can correctly repeat the prescribed formula of daily prayer, and the lucky man who has been taught to read and write, steals from hut to hut with a well-thumbed copy of the Koran slung over his shoulders in a leather bag, a huge wooden ink bottle dangling at his girdle, and a dressed goat's skin to do duty as a prayer carpet. One of these learned individuals whom we met at Tohén, was dignified with the title of "Doctor," but with what reason I could not discover.

The Bedouins live almost entirely upon milk, and prefer it to any thing else; so long as they can procure a moderate supply of this article from their flocks they rarely touch any thing else, save when they visit the coast. Rice, jowari and dates are imported in large quantities from India and Arabia, but they rarely use them until the dry season diminishes the quantity of milk. For the same reason, except during the hot season, they are unwilling to part with their flocks, and though we experienced but little difficulty in procuring a sufficient and regular supply of fresh meat, our success I imagine ought to be attributed to the magic influence of dollars instead of rice and coarse dungaree cloth, which form the common articles of barter on this coast. As the season advanced, however, even money began to fail to induce the people to sell their fat sheep and goats, and at the time that I am writing this, we have been compelled to send a man three days' journey to procure them.

The Bedouins rarely drink coffee, and their reasons are rather good. "If we drink coffee once," say they, "we shall want it again, and where are we to get it from."

This abstemiousness amongst them when dependent solely upon their own resources, vanishes as soon as a hearty meal is offered at the expense of any one else, when they will consume an immense quantity of meat, rice and *ghee*, on the prudent principle of profiting by the opportunity; and the man who sells a sheep to a traveller on a journey, always considers himself fully entitled to a share of the same.

We made frequent short excursions inland during the operations on the wreck, and we were never molested by any of these people, though I should not feel disposed to place entire confidence in them. That they are all arrant thieves we found out, certainly to our cost at our camp, where a regular system of plunder went on for a short time. They were all so miserably poor, that any thing like hospitality could hardly be looked for; but we always experienced civility from them if we approached their huts, and entered into conversation with them. A few spoonfuls of sugar to the children generally had the effect of bringing out the females of the *ghurrea*, (a place where the shepherd resides,) and in a few minutes we were the best friends in the world. On one occasion, a girl was brought who had lost her foot and ancle by the bite of a snake, and who was hopping about with the help of two sticks. On Captain Powell proposing that she should have a wooden leg, and offering to get one made, the crowd of listeners at first were lost in wonder, but when the principle and the advantages of the said wooden leg were explained, they were beyond measure delighted, and declaring that so astonishing a conception never would have entered their thick heads, they begged that the carpenter, might be set to work directly; a handsome wooden leg was accordingly made, and under the superintendence of the surgeon, strapped on properly; but what afterwards became of the young lady I never heard.

Ignorant and simple as these people are, it is not surprising that their jealousy should occasionally have been awakened when they saw a strange people, so superior in every way to themselves, wandering about their country without any apparent reason for so doing. Contented as they were with their stony mountains, they naturally felt alarmed at the preference we appeared to shew for them, and the idea that we were about to take the country, was seriously discussed.

I had returned from the Jerd Hafoon range after two or three days' stay there, and where, owing to the heavy rain, I had been compelled to take a tent, and in company with Captain Powell, was on my way to an assemblage of the chiefs at a considerable distance from our camp, when we were overtaken by a party of Bedouins, of whom one, by name Noor, was a chief of some importance at Murayah. Leaning upon his two spears, he in the first place peremptorily ordered us to halt where we were and proceed no farther, which, in-as-much-as all our baggage had gone on, we thought proper to decline. With his eyes flashing and in a towering rage, he then said, "If you are men, we also are men, and therefore it is *wajib* that we should understand each other, and now I wish to be informed by what right you have built three forts on Jerd Hafoon, and what you mean by wandering over the country as if you were the owners of it." We told him that any thing he might have to say, we should be glad to hear at the end of our day's march, and requested him to follow us, to which, after some demur, he consented. On the road, however, he made some inquiries from one of our followers, which apparently made him heartily ashamed of himself, and on our arrival at the halting place, he came into our tent at once, and said, that the Bedouins had seen my tent pitched on the Jerd Hafoon range at three different points, and taking it for a chunamed building, had reported it as such to him. We laughed at him for his folly, and became good friends again.

Though the town's-people affect to despise the Bedouins, and speak of them as a treacherous race, they form the only fighting men in the event of war. Their elders, moreover, are descended from the Sultan, and their voice has sufficient weight at a great national meeting to drown the clamours of the arrogant chiefs who reside on the coast. The name of the Sultan among the Bedouins is highly venerated, and certain customs handed down from time immemorial still exist to remind them of the respect due to the family.

A short account of the division of the country will serve to shew whence these Bedouins derive their power.

Sultan Mohamed, the last chief who governed the entire country, and whose death took place some 300 years ago, at his death divided the country equally between his three eldest sons, Othman, Esa and Omar.

To Othman was allotted the Northern portion, extending from Bunder Ghassim to Ras Hafoon. To Esa, the part between the country of Othman and the Wadi Nogal; and to Oman, the belt of country from Wadi Nogal to the province of Murreyhan.

From Esa and Omar sprung the Bedouin chiefs, whose influence I have just mentioned, whilst the posterity of Othman enjoyed the Bunders and the trade with the opposite coast. From Othman we pass through four generations, which brings us to another, Sultan Mohamed, who died 25 years ago.

The chief had had six wives and 17 sons, of whom 12 are now living. Prior to his death, he portioned out his territory amongst his children, allotting a separate village to the sons by each wife, but enjoining them to pay obedience to the authority of his eldest son, who would be his successor. Bunder Murayah became the residence of the Sultan Othman on the death of his father, and the villages of Aloolla, Feeluk, Geyseli, Gursah and Wurbah were divided between his brothers. Sultan Othman, in conjunction with a Somah merchant named Fatha Abdi, built seven or eight fortified houses at Murayah, and considerably increased the trade of the port.

He died at about the age of 50, and was succeeded by his eldest son Yusuf, who after a turbulent reign of two years, was treacherously slain by an individual of the Ali Seliman branch of the Mijjertheyn, inhabiting Bunder Khor. His only son, a boy of four or five years of age, being too young to be considered of much importance, was dignified with the name of Sultan, which, when he attains to manhood, his great uncles probably will not permit him to enjoy. He is under the guardianship of Noor Othman, his uncle, who has also married his mother, and who in striving to maintain the importance due to the Sultan, has succeeded in causing a bitter and irreconcileable feud with the other branches of the house of Othman.

To account for the large number of children that are frequently found in one family, it must be borne in mind, that polygamy, which to the extent of four wives is *tolerated* by the Mahomedan law, is here in a powerful chief considered indispensable. Four wives are therefore married as soon as possible after he arrives at manhood; any wife proving barren, or who has given over bearing, is at once divorced,

and another substituted. In some cases, especially when a chief has lost several children in battle, a much greater licence is allowed, and the number of wives is unlimited.

I have mentioned that Sultan Mohamed had 17 sons; but if my information is correct, he had also 19 daughters, who in accordance with eastern custom, do not "count" as part of the family.

When the Steam frigate *Memnon* was wrecked on this coast on the 1st of August last, the chiefs of Feeluk, Aloolla, and Geyseli, and from their vicinity to the scene of the disaster, were the people who profited most by plunder, &c., of which the inhabitants of Bunder Murayah could not partake, owing to their being at a greater distance. Unable to induce their greedy brethren to give them a share, they affected a virtuous spirit, and thanked God they were not robbers of strangers who had been cast away on their coast, and that had *they* only been there, not even a copper bolt would have been stolen, but most carefully preserved until the English came for it. The less scrupulous chiefs of Aloolla and the other villages, perfectly content with their rich booty, laughed to scorn the *disinterested* remonstrances of their brothers at Bunder Murayah; but to their great astonishment and chagrin, at the annual meeting that took place at Ghoraal on the Jerd Hafoon range in January last, they were severally fined by the assembled elders and chiefs of the tribe for daring to appropriate to themselves property cast on the shore by the sea, without the consent of the "Sultan's house," and this fine, which consisted of one horse each, they were obliged to pay.

The Mijjertheyn pride themselves upon being a peaceful nation, and are fond of speaking of their country as "*Urdel Aman*," a title which when compared with the Edoor Hebrawul and Esa Somalis, they in some measure deserve. Murder is uncommon, and the "*reesh*," or ostrich feather in the hair,* which to the westward denotes that the wearer has killed a man, is by this tribe considered both unholy (*haram*) and unmanly. The fine for murder, if considered unprovoked, is a hundred she-camels with young, or a corresponding sum of money. Blood feuds are unfrequent; commutation by fine ge-

*Note:—This coincidence in custom with the Abyssinians is one of the most striking of the many proofs of the Arab origin of the latter.—Eds.

nerally being preferred, and are carefully avoided if possible. During their debates, quarrels almost invariably arise, daggers are brandished, spears poised, and a stranger would expect an immediate conflict, but the old men generally step in and prevent the parties from injuring each other, by taking away their arms, which after a decent show of reluctance are given up with much secret satisfaction, as the necessity for fighting "*á l'outrance*" is thus avoided; their arms are two light spears, and a shield of rhinoceros or bull's hide, with a long straight double-edged dagger. Numbers of the lower class of Bedouins carry a bow and quiver of poisoned arrows, and some few are to be seen with marvellously ill-looking swords. Matchlocks being beyond their reach, they affect to despise, as cowardly, weapons that kill from a distance; that very quality, however, considerably enhanced the respect paid to our rifles and double-barrelled pistols; and one of the chiefs was so captivated with a revolving 6-barrelled pistol belonging to an officer of the *Constance*, that he offered him a horse in exchange.

Their arrows are tipped with an iron head, just below the barb of which they fasten a black glutinous substance made of the pounded bark of a tree and the white milky juice of one of the Cactus tribe, which forms a deadly poison. I made many fruitless efforts to procure a specimen of this tree, which grows chiefly in the lofty ranges of the Jibel Wursungeli.

Armed with these tiny weapons, like the Bushman of South Africa, the Bedouin posts himself in a thick bush near the haunts of the large antelope, called here the *gurnook*. A companion with a camel takes a wide circuit, looking out carefully for game, which when he sees, he contrives to drive up by degrees towards the ambush, always taking care to keep under the lee of the camel. The antelope disliking a camel, gradually retreats without being alarmed until within 20 feet of the bush, when the spin of the unerring arrow through the shoulder brings down the quarry, which dies in three minutes. In this way the Bedouins frequently provide themselves with an abundant supply of fresh meat; many of these antelopes weighing 70 and 80 pounds.

The effect of this poison on a man is the dropping off of his hair and nails, and his speedy death. The deep excisions and sears from burning that are so common on the limbs of the men, sufficiently attest the dread in which they hold this deadly poison. The instant a

man is wounded by an arrow, the part injured is cut out with a dagger, and fire applied to the wound as soon as possible; and yet when an antelope is killed with one of these arrows, they content themselves with merely cutting away that part of the flesh to which the arrow adheres, and which on the specimen that Captain Powell and I saw, had a deep purple appearance. Marriage with the men takes place at about eighteen or twenty, and with the women at fourteen to sixteen. A young man of property wishing to marry, and not finding a wife to suit him in his neighbourhood, sends a trusty messenger to another tribe, who selects a fitting maiden, and demands her in marriage in the name of his master. If the terms are accepted, the young lady is sent to her future husband's encampment, under the escort of the messenger, and on her arrival there, is treated with all respect by the family, and her friends and relations are invited to celebrate the marriage feast, which generally lasts seven days. The sum paid to the father of the bride, frequently amounts to 150 dollars, given partly in money, and partly in kind. The bride is required to provide mats for the hut and bed, with a few wicker bowls gaily ornamented with white couries for milk. Her wedding finery, consisting of a few beads, is contributed by her friends. In the absence of the *cazee*, any person who can read the *koran*, officiates; and frequently to spare the modesty of the bride, her brother or some near male relation acts for her during the ceremony, as *wakeel* or proxy.

In the event of the husband dying, his brother is expected to marry the widow, and by many the obligation is considered so imperative, that one of their own wives is divorced to make room for the new comer, and yet strange to say, marriage between cousins is strictly forbidden amongst these people. Divorces are common, and not considered disgraceful. The triple oath sworn in the presence of two witnesses is sufficient, and at the expiration of three months the woman is at liberty to marry again. On the birth of a child, the mother is compelled to seclude herself for a period of seven days, after which she resumes her ordinary daily employment. Circumcision takes place at seven years, and they affirm, that it was practised before the *Hejira*, which is most improbable. The duties of the women consist in watching their flocks of sheep and goats, fetching wood and water and doing all the drudgery. The she-camels are under the care of the men entirely, whose only

other employment is gathering gums in the hot weather. Great care is required in tending the sheep and goats, on account of the number of *cheetas* that prowl about in the neighbourhood. On one of the savage animals being seen, the alarm is instantly given, and the men sally forth well armed to dislodge the intruder. A desperate fight takes place which ends in the death of the tiger, after he has fearfully clawed one or two of his assailants.

Some of the principal Bedouin chiefs possess upwards of a thousand she-camels, which may be valued at two or three dollars each, located in different pastures many days distant from each other, and under the care of one of the wives, and a few followers belonging to the family. They are generally found in droves of 50 to 80. The sheep and goats are divided in the same manner, a man rarely keeping more than 500 in one place, and thus the life of the chief is spent in continually wandering from *ghurreea* to *ghurreea*, visiting his different folds as well as his different wives. The number of sheep and goats exported from this coast, though not one-tenth so great as from Kurreem and Berbura, is still enormous, and not less than 15,000 head per annum; but the sheep for export generally come from the Wadi Mogul, and the fertile plains bordering on the province of Murreyhan.

They have large droves of horned cattle, the milk of which is almost entirely used for the purpose of making *ghee*. They are fine animals, and one that we purchased at Ras Assey weighed above 300 pounds.

Horses are abundant amongst them, and highly valued. The best description frequently selling for 150 dollars, (in kind.) They are of a small breed, and so villainously treated, that whatever beauty they may have when very young, completely disappears by the time they are five years old. To ride violently to your tent three or four times before finally dismounting is considered a great compliment, and the same ceremony is observed on leaving. Springing into his saddle, (if he has one) with his spears and shield, the Somali cavalier first endeavours to infuse a little spirit into his half-starved hack, by persuading him to accomplish a few plunges and capers, and then his heels raining a hurricane of blows against the animal's ribs, and occasionally using his spear point as a spur, away he gallops, and after a short circuit in which he endeavours to shew himself off to the best advantage, returns to his starting point at full speed, when the heavy Arab bit "brings up"

the blown horse with a shock that half breaks his jaw, and fills his mouth with blood.

The affection of the true Arab for his horse is proverbial; the cruelty of the Somali to his, may, I think, be considered equally so.

During the hot season, the men and boys are daily employed in collecting gums, which process is carried on as follows:—

About the end of February, or the beginning of March, the Bedouins visit all the trees in succession and make a deep incision in each, peeling off a narrow strip of bark for about five inches below the wound. This is left for a month, when a fresh incision is made in the same place, but deeper. A third month elapses, and the operation is again repeated, after which the gum is supposed to have attained a proper degree of consistency.

The mountain sides are immediately covered with parties of men and boys, who scrape off the large clear globules into one basket, whilst the inferior quality, that has ran down the tree, is packed separately.

The gum when first taken from the tree is very soft, but hardens quickly. The flame is clear and brilliant, and the traveller is frequently amused by seeing a miserable Bedouin family cowering under a wretched hovel, or hole in the rocks, eating their scanty meal by the light of half a dozen frankincense torches. Every fortnight the mountains are visited in this manner, the trees producing large quantities as the season advances, until the middle of September, when the first shower of rain puts a close to the gathering that year.

On my first arrival here, I made many inquiries regarding the quantity of gums annually shipped from this coast for the Red Sea and Indian markets, but the accounts I received were so surprising, that I placed no confidence in them. As I became more acquainted with the merchants here, I was able to make more minute inquiries. I first ascertained the number of boats belonging to the tribe, and their owners, I then, by visiting the different ports, found out how many boats had taken cargoes of gums at the opening of the fair season, and by comparing their statement with different accounts that I got afterwards from the shippers, I was enabled to form a tolerably just estimate, in round numbers, of the large quantity annually exported from this coast, and which export trade is almost entirely in the hands of those never-failing speculators, the banians of Porebunder and Bombay.

At the close of the N. E. monsoon, a party of these banians arrive on the coast, and settle at Feeluk, Geyseli, Bunder Murayah, Wurbah, and Bunder Khor. The Bedouins from the interior immediately visit them, and as there is no one to compete with them, they manage to engross the greater part of the trade. As the season draws on, the Bedouin finds that his gums are finished, and he is fain to purchase food to last him through the hot weather, before the setting in of the grass, on credit, and thus a running account is carried on from year to year, which of course the wary creditor takes care never to settle. The people are perfectly aware how much they are pillaged, and earnestly hope that some of the ships that they so frequently see passing along their coast, might be induced to come in and trade with them. A small vessel might easily do this; but to ensure her cargo being ready for her, an agent must be established on shore. The articles that should be brought for the purpose of barter are rice, both coarse Mangalore and Bengal, in gunnies; dates from the gulf; Surat tobacco; double dungaree, and coarse white American sheeting cloth, with a few Surat blue striped turbans and *loongees*, and a small quantity of the iron called *hindiwan*. Money should also be forthcoming if preferred. German crowns (without holes in them) are the only coin; though during our stay, rupees were often accepted. A vessel arriving at Bunder Murayah about the end of September, would be enabled to fill up a cargo of gums in three or four days, if the agent had been moderately diligent during the hot weather.

I annex a list of the boats employed, and the quantity actually shipped in each; and I now offer a rough estimate of the quantity shipped this year, taking the weight of the *bahar* at 10 to the ton. Between the 1st September 1843 to the 1st March 1844, the quantity of gums exported was as follows:—

To Bombay,	.. ..	3,770 *bahars.*
,, the Red Sea,	..	2,350 ,,
,, the Arab Coast,	...	1,200 ,,
Total,	..	7,320 *bahars* which
at 10 to the ton, gives	..	732 tons.

The season of 1843 was considered as very unfavorable, owing to the drought, and the crop of gums not more than half the average quantity, and I was assured that three years ago the export exceeded 20,000 *bahars;* but taking every thing into consideration, I think from 900 to 1,000 tons may be set down as a fair estimate.

The trees that produce the *luban*, or frankincense, are of two kinds; viz. the *luban meyeti*, and *luban bedoui*, of these, the *meyeti* which grows out of the naked rock, is the most valuable, and when clean, picked, and of good quality, it is sold by the merchants on the coast for $\frac{1}{4}$ dollar per frasila of 20 pounds. The *luban bedoui* of the best quality, is sold for 1 dollar per frasila of both kinds; the palest colour is preferred. The trees vary greatly in height, but I never saw one above 20 feet, with a stem of nine inches diameter. Their form is very graceful, and when springing from a mass of marble on the brink of a precipice, their appearance is especially picturesque.

The gum arabic, or *summuk*, is of three kinds; viz. the *ad-ad*, *wadi* and *aukokib*, of which the *aukokib* is considered the best. It sells at Bunder Murayah for $1\frac{1}{2}$ dollar per frasila of 20 pounds. The tree is found on the mountain sides, in a good red soil, and varies in height from 10 to 20 feet.

The inferior qualities of gums of course are sold at a much lower rate, but when it is remembered that the merchant who resides at the Bunder, purchases two pounds of frankincense for one pound of dates, and one pound of *summuk* for two pounds of dates, the profits may be easily imagined; for instance, a man purchases a bag of Muscat dates weighing 120 pounds for $\frac{1}{4}$ dollar, with this he purchases 12 frasilas of *luban*, which he sells to the traders, who sell for it at the rate of one frasila per $1\frac{1}{4}$ dollar.

Myrrh is brought from Wadi Nogal, and from Murreyhan and Agahora; some few trees are found on the mountains at the back of Bunder Murayah, about 50 miles from the Levant. It is sold at Bunder Murayah, when well picked and clean, at 4 pounds for a dollar. I sent inland when at Bunder Murayah, and succeeded in getting two specimens of the tree, which is I believe, but slightly known.

The quantity of the *ghee* that is brought down for sale is too trifling to merit any remark. It is, however, singularly clear and good,

perfectly free from the disagreeable smell that distinguishes the *ghee* from Kurachee, though the major part of that originally comes from Berbura. The banians from Pore Bunder, who regularly attend the Berbura fair, carry back immense supplies of *ghee* for the Indian market, and as the Somahs are celebrated for melting down sheep's tails and mixing the fat with the *ghee* to increase the quantity, the disagreeable odour that attends "*ghee*, Kurachee 1st sort," may perhaps be accounted for.

Of the countries to the South and West of the Mijjertheyn tribe, nothing is as yet known, and as what little information I have been able to pick up would only swell the mass of *hearsay evidence* that already exists without establishing any fact, I refrain from making any remark on the rivers, &c. that have afforded such field for discussion. Of the practicability of exploring the course of these rivers, I have no doubt, nor should I apprehend any hostility on the part of the natives, if the traveller was only duly attended by a Mijjertheyn chief. Repeated offers were made to me to visit the stream generally called the "Wabi," (Wabi or Webbi in the Somal language means a river,) and I only regretted that I was unable to do so.

Since this was written, I have met a gentleman, Mr. Angelo of Zanzibar, who has recently sailed above 200 miles up the Jub, and suffered no ill-treatment.

A most interesting journey might be made from a few miles South-west of Hafoon, along the Wadi Nagal to Kurrum on the Berbura coast. In this valley the best kinds of myrrh grow, and as the inhabitants are of the Mijjertheyn tribe, no danger need be apprehended.

My principal reason for offering this brief memoir to Government is to point out the advantageous trade that might be carried on with this hitherto imperfectly known country, and I much regret that I was unable from other duties to visit the interior. I would wish to make one concluding remark. Though the general character of the Somalis is by no means good, I much doubt if a vessel were wrecked on any other coast inhabited by perfect savages, such as the Mijjertheyn, whether the crew would have fared as well as that of the steam frigate *Memnon*. During a residence of six months amongst them we experienced no opposition, and were finally allowed to quit the coast on our own terms, and in perfect friendship with all.

(Signed) C. J. Cruttenden, *Lieutenant,*
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Number of boats laden with gums during the season of 1843, and their owners.

To Bombay.

Robea bin Salem, ...	700
Lalla, ...	600
Mahri, ...	600
Kyeti, ...	300
Alli Myjee, ...	500
Ayal Rocknah,...	300
Shea Khan, ...	300
Aial Tarba Hersee, ...	270
One name unknown, ...	200
	3,770

To the Red Sea.

Shermakhi, ...	800
Bon Saloom, ...	250
Adthiya bin Ahmed, ...	200
Doongoorna, ...	200
Several small Vessels, ...	700
	2,350

To the Arab Coast.

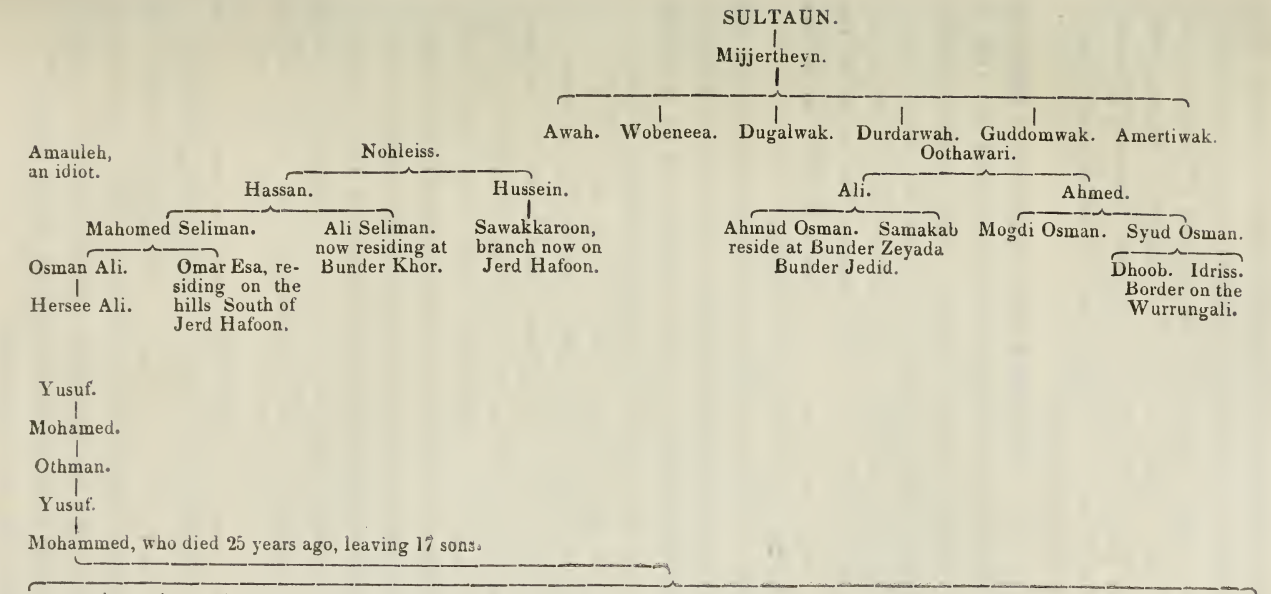
Vessels owners residing at Shahr and Maculla, ...	1,200

Grand Total, ... 7,320 *bahars*, which at 10 to a ton,.. 732 tons of gums.

List of Boats owned by the Mijjertheyn tribe.

Aloolla, ...	2	Boats,	1 Alli Yoosuf, 1 Esa Tyah.
Geyseli, ...	1	"	Esa Dohel.
Gursah, ...	1	"	Shermarkhi Fyah.
Marrayah, ...	1	"	Tatha Abdi.
Bundi Khor,... ..	1	"	Tarha Kersee.
Bunder Baad,. ...	1	"	Abdulla Farha.
Bunder Ghassim, ...	1	"	Ahmed Shabhah.
Bunder Zeyadal, ...	1	"	Shermarkhi.
Bunder Zeyadal, ..	1	"	Abdialli.
Bunder Zeyadal, ...	1	"	Mahammed Woorsuma.
Bunder Zeyadal, ...	1	"	Nahleyah Bon Beker.

(Signed) C. J. Cruttenden.



Note.—D means, that this son is dead.

(Signed) C. J. Cruttenden,
Assistant Pol. Agent, Aden.

Examination of a remarkable Red Sandstone from the junction of the Diamond Limestone and Sandstone at Nurnoor in the Kurnool Territory, Southern India. Received for the Museum of Economic Geology, from Capt. Newbold, *M. N. I. Assistant Commissioner, Kurnool. By* Henry Piddington, *Curator Museum of Economic Geology of India and of Geological and Mineralogical Departments, Asiatic Society Museum.*

It is with many good writers, and I think with justice, a subject of regret that the chemistry of geology is so little attended to. One of the reasons for this may perhaps be, that the results are often unsatisfactory, or at least offer nothing striking, and we are thus much tempted when we have bestowed our labour in researches of this kind to put them aside, being unwilling to obtrude them on the notice of the scientific world, which has indeed so many more brilliant and at first sight more interesting things to occupy its attention.

It may however be doubted whether in so doing we do rightly and well; for although our results may be always, as results, of little moment, (and this is not always certain,) yet if we consider that by recording our own work, even when obtaining mere negative results, we may save work to others we might perhaps oftener do so, and this with that amount of benefit to science which arises from sparing the labours of our brother workmen, and informing them where our researches *quantum valeant*, may have failed to elicit any thing striking, though appearances might lead us to suspect that a rock did contain more remarkable constituents. It is from this motive then that I have thought it right to place upon record my examination of this remarkable sandstone, which would certainly attract the attention of any geologist or mineralogist, who might meet with it *in situ*. Its geological position, in the diamond tracts, also adds something to the interest of the specimen.

Capt. Newbold thus describes it, and I quote his description as one conveying very faithfully, as far as it goes, the appearance of the rock: "Examining it hastily, the rock appears to be composed of a dark red earthy and sometimes spongy-looking mineral, veined and streaked with a dark green chert, and imbedding curious crystals of a flesh-like-looking mineral with a fracture resembling that of rock crystal."

I should further add, as to appearance,

It appears "peppered" over with minute black grains, which by the magnifier are seen to be little nests of protoxide of iron, and exteriorly it is covered with a red, and in some places a black varnish, which is often somewhat shining. Where the stone is weathered, below this varnish, it is a reddish grey sandstone, evidently shewing traces of lamination in the line of the chert laminæ and veins.

The foregoing are its most remarkable appearances as to sight. I proceed now to describe it more regularly.

Its fresh fracture has but a little fresher colour than the internal part of the hand specimen. It gives out a peculiar faint odour when broken, which resembles that of iodine (or seaweed ?) more nearly than any thing which occurs either to Capt. Newbold or myself; the fracture is somewhat splintery and angular rather than cubical. It has no disposition to break in laminæ.

It is opaque, the streak a dirty yellowish, or orange, white. It does not soil: hardness about that of Fluor. It is not tough, except about the cherty veins, and is easily powdered. It does not adhere to the tongue. It feels meagre but greasy on the external varnish.

It specific gravity is 2.64 at Temp: 84°

Its smell I have described above.

Its taste to the tongue is very earthy, and it gives an earthy odour, though not strong, when breathed upon.

It is pounded with tolerable ease, scarcely shewing the hardness of silex, except in a few grains at the last.

In washing off, the first water is of a dull brick red, like the usual ferruginous mineral washings, the residuum is a dull greyish and denser powder, which by long rubbing also diffuses in the water, but is, especially the last portions, of a very bright (almost vermillion) red.

This powder however gives nothing but oxide of iron.

The whole washings being mixed and allowed to settle.

Blowpipe.

Open tube.—Very little or no smell, and that rather turfy and peaty than iodic; no sublimate.

Bulb tube.—Water abundant. Litmus paper discolored; turmeric paper not affected; smell that of peat, but not strong; silver leaf is discoloured, shewing the presence of sulphur, probably from some peaty mixture with it when deposited.

In the forceps—Fuses into a metallic looking slag at the edges.

With Soda on Charcoal.—Fuses with considerable ebullition, and a part is reduced, giving bright white, and soft, metallic grains and streaks in the mortar; these dissolve quickly in nitric acid, but give no precipitate with mur: acid. With prussiate of potass, dark blue precipitate and are therefore iron.

The powder of the washing before the Blowpipe, with Soda on Platinum Wire.—Fuses with effervescence into an opaque and dirty olive green wrinkled bead, which in the reducing flame becomes speckled with dark spots. With more soda the same. In the reducing flame greyish. The bead allowed to deliquesce takes a bright olive (or grass) green, and in the mortar gives metallic traces as before.

Via humida.—Powder boiled in mur: acid, the red colour changes to a dull yellow or dirty orange, with a white powder at bottom. When cool and settled, the acid is of a clear yellow orange; tested by prussiate potass. Dark blue.

Tinct. Galls.—A clear brown which by the addition of lime water, becomes purple and black.

Hydrosulph. Potass.—A dirty black brown.

Hydrosulph. Ammonia.—The same.

The solution filtered left a greyish white powder which was silex.

The solution was evaporated, re-dissolved and precipitated by benzoate of ammonia. The precipitate was of a light buff colour and the solution left clear. This solution and the precipitate gave no trace of titanium, but a little iron was found in it; the benzoate of ammonia not having, apparently, precipitated the whole of the oxide.

For Iodine.—The powder heated gradually with concentrated sulphuric acid evolved no vapour, and before the blowpipe with microcosmic salt and oxide of copper gave also no trace of Iodine.

The sulphuric acid solution gave no trace but of iron.

The cherty-looking Veins.—A vein giving both with the soft iron of a knife and a steel edge-tool, a greenish metallic streak, was selected.

A small triangular fragment fuses into a black slag at the apex, the assay becoming black and iron-like. Fused with soda an olive coloured bead, with borax clear pale-green glass, shewing only silica and iron.

Result.—The rock is a red ferruginous sandstone, with pure silica in grains, and protoxide of iron (Hæmatitic ?) in little black specks and

nests, and chert, (hydrate of silica,) in veins and spots. It is slightly impregnated with peaty matter, and its smell is probably owing to this and to the minute proportion of sulphur which peat contains, and which in the specimen just discolours silver foil in the neck of the bulb tube.

H. Piddington.

Report of a Journey from Herat to Simla, via Candahar, Cabool and the Punjaub, undertaken in the year 1838, *by order of His Excellency* John McNeill, Esq. *H. B. M. Envoy Extraordinary and Minister Plenipotentiary at the Court of Persia. By* Major Todd, *Acting Secretary of Legation.*

The circumstances under which this journey was undertaken, the short time (sixty days) which it occupied, and the disturbed state of some of the districts on my route, prevented my taking more than a hasty survey of the countries through which I passed, or obtaining any information beyond what chance threw in my way.

The following rough notes were mostly jotted down either on horseback, or after being in the saddle from twelve to fifteen hours out of the twenty-four.

I left the Persian camp before Herat, on the 22nd May, and arrived at Simla on the 20th of July.

The city and valley of Herat have been minutely described by successive travellers. It may, however, be required, that I should say a few words on the defences of a place which, garrisoned by a small band of determined men, had up to the date of our latest authentic intelligence, successfully resisted the whole concentrated power of Persia for upwards of seven months.

The strength of the besieging army may be estimated at from 12 to 15,000 regular infantry, 7 or 8,000 irregular horse, and about 50 pieces of brass ordnance, 24, 18, 14, 12, 6 and 4-pounders, about half being of the two last mentioned calibres, with half a dozen 5½-inch mortars. I do not think that the besieged mustered more than 2,500 fighting men, actually under arms. They had no artillery, and their horsemen had been sent away to Korook, Subzawaur, and other places soon after the commencement of the siege.

The city of Herat is of an oblong shape, about 1,600 yards in length and 13 or 14,000 yards in breadth. The place is encircled by an artificial mound of earth, varying from 40 to 60 feet in height, on the summit of which stands the wall of the town. There are about thirty bastions on each face, circular and built of unburnt brick ; those at the angles of the place being much larger and higher than the intermediate ones. The height of the bastions, and walls about the mound, varies from 25 to 35 feet.

The following rude section of the defences will illustrate my description of them :—

a. The artificial mound mentioned above, which forms the real circle of defence.

b. The walls of the place.

c. c. Trenches cut in the mound, or what may be called the exterior slope of the rampart, about $6\frac{1}{2}$ or 7 feet deep, and running entirely round the place. These are called the upper and lower Sheer Hajee, or Sheerazah, and in them are stationed nearly the whole of the garrison. The Sheer Hajees communicate with one another and with the town by subterranean passages, and since the commencement of the siege, they have been partly traversed.

d. The ditch.

e. The town.

I saw the ditch only at two points, at the S. E. angle of the place it was about nine yards broad, with water in it, but not filled. The Affghans had established a covered way, or place of arms on the counterscarp, communicating with the scarp by means of a plank thrown across the ditch. The Persians had worked up to within ten or twelve yards of this work, and both parties were incessantly engaged in mining and countermining. I also saw the ditch between the S. W. angle and the Candahar gate, which is situated in the centre of the southern face. It was dry at this point, and about twelve yards broad. The Persians had here advanced a covered gallery half way across the ditch.

The exterior slope of the artificial mound or rampart is at an angle of from 35 to 45, forming in most places too steep an ascent for men encumbered with arms, in face of a determined enemy. The breadth of this mass of earth, at its base, may be from 90 to 100 feet. There

are some places where the ascent is not so steep, and at one of these, the Persians, in a late attempt at assault, clambered up to the upper Sheer Hajee, of which they kept possession for some time.

The citadel of Herat is built upon a mound at the northern end of the town, surrounded by a wet ditch, said to be of considerable depth, and about 36 feet wide, and flanked by large massive towers of burnt brick, 60 or 70 feet high. The position is a strong one, and might be held for some days, or even weeks, after the fall of the town. The only entrance to the citadel is on its Southern face, over a bridge, which might be destroyed in a few minutes.

On the northern face of the town, an outwork has of late years been constructed, called the Ark-i-no, or new citadel. This covers the citadel, and one of the gates of the town.

From the above rough sketch of the defences of Herat, some idea may be formed of its strength. It would be very difficult, if not impossible to breach it with artillery, and the immense quantity of powder which would be necessary in order to establish such a mine as would effect a practicable breach, may be estimated from the dimensions of the rampart above given. From the size of the place, it would require an army of 25 or 30,000 men to invest it effectually.

Herat is not, however, without its weak points. The ruined walls of houses and gardens surround the place, and afford shelter to the besiegers, almost up to the edge of the ditch. On the northern side of the town is an immense mound called the Tull-i-bunjee, which was thrown up I believe by Nadir Shah, about 4 or 500 yards from the walls, and behind which a couple of regiments might be encamped, completely screened from the fire of the town. The very size of Herat is also a weakness: it would require a garrison of at least 10,000 men to defend it against an active and enterprizing enemy.

The Sheer Hajees are not traversed throughout their whole extent, and might therefore by an enfilading ricochet fire be rendered in some places, untenable.

Nearly all the weak points above-mentioned, might, however, be remedied by a skilful engineer, and if time were allowed for this, the place supplied with guns, and a sufficiency of ammunition, and the works defended with common bravery, the capture of Herat even with European troops, would be a tedious and difficult enterprize.

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Herat, .. .	..	..	On leaving the town, the road to Candahar leads due south, through a succession of gardens and fields, intersected by numerous water-courses. About three miles from the town, the Herirood or Pul-i-Malarun river is crossed. Formerly a fine bridge of burnt brick spanned the stream at this point, but the river has formed for itself a new channel, and now flows round one end of the bridge. The breadth of the river, at the place where I crossed, was about 150 yards, the stream was exceedingly rapid, and water reached to our saddle flaps: several fatal accidents had lately occurred to persons who had attempted to ford the stream, when it had been swollen by a fall of rain in the adjacent mountains. To the south of the river is a fine tract of pasture land, thickly studded with villages and gardens.
Houz, ... (reservoir of water,)	14	S.	Situated in an opening of the range of hills, to the south of the town.
Meer Daoud,	4	S.	Caravanserai in good repair, with a fine stream of clear water from a kahreez or succession of wells, connected by an underground passage, which conducts the stream from its source.
Shah Beg,..	12	S.	Ruined caravanserai; abundance of water.
Meer Allah,	12	S.	Ruined caravanserai, $5\frac{1}{2}$ miles beyond Shah Beg a spring of sweet water on the left of the road. The caravanserai of Meer Allah surrounded by cultivation, and a fine stream of water runs under the walls.
Rood-i-Guz,	6	S.	A rapid stream 15 or 20 yards broad.
Rood-i-Adruscund,	5	S.	Stream one mile beyond Rood-i-Adruscund, a rocky pass with springs of fresh water.
		S.	
Khajeh Ourieh.	6	S.	A Ziaret-gâh, or place of pilgrimage. A ruin perched on the summit of a rocky

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Khajeh Ourieh. *(continued.)*	6	S.	hill, at the foot which runs a stream slightly brackish.
	4	S.	Road turns off to Subzawaur, leaving that which leads direct to Candahar on the left.
Houz, ...	7	S. W.	Reservoir of water ruined.
Subzawaur,	10	SS. W.	A small mud fort, 200 or 250 yards square, with seven circular bastions, on each face one gate. On the Southern face scarcely any ditch, the walls in a state of dilapidation. A small ark or citadel, the residence of the Prince governor in the centre of the place. Subzawaur is a place of no strength, and might be taken with little loss by a *coup de main*. It is situated in the midst of a richly cultivated tract of country studded with innumerable villages, which are inhabited by Noorzyes. Each village is about sixty yards square, surrounded by a mud wall, with towers at the angles. A range of hills of inconsiderable elevation to the south of the town, distant about two miles. The road between Herat and Subzawaur is good and level, and passable for wheel carriages of every description. Abundance of fresh water in every part of this route ; but provisions are not procurable at any point between Herat and Subzawaur. Shahzadeh Iskunder, a son of Shah Kamran was nominally the governor of this district. When I passed through it, he possessed, however, little weight or influence anywhere, and none beyond the walls of his fort ; he seemed to be a half-witted and imbecile person. He had made no attempt to succour his father, or even to divert the attention of the Persians. The surrounding country was in a state of utter disorder. Bands of plunderers were roving about in every direction,

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Subzawaur, *(continued.)*	10	SS. W.	and those men were described as acknowledging neither God nor king.
	13	E.	At this point, the road from Subzawaur joins the main road between Herat and Candahar. The range of hills to the south of Subzawaur terminates four miles from the town in a long spur, upon which the remains of an extensive fort are visible. This is called the Kulla-i-Dookhter, or maiden's castle, and at a short distance from it, on a mound in the plain, are the ruins of another castle called Kulla-i-Pisr, or the youth's fort ; the plain is thickly studded with villages and *khails* (encampment) of Noorzyes. Abundance of water, road perfectly level.
Kharuck, ..	30	S. E.	A grove of *khunjuck* trees, with a fine stream of water situated under a range of hills running W. S. W. and E. N. E. Wells or springs at every six or eight miles, but no provisions procurable. For the last 4 or 5 miles, the road hilly and difficult for wheel carriages ; but a road which is described as being good and level, strikes off to the right three miles before Kharuck, and after turning the Kharuck range crosses the plain to Dowlutabad, where it again joins the road which I followed. Encampments of Noorzyes are occasionally formed in the vicinity of Kharuck, but these cannot be depended on for furnishing supplies even to a small force.
Summit of Pass.	3	S.	Road or rather pathway impassable for wheel carriages.
Dowlutabad,	15	S. E.	A ruined fort on the right bank of the Furrah, and several large encampments in the vicinity. The valley of the Furrah road runs from N. E. to S. W., and is said to be richly cultivated in the vicinity of the town of Furrah, about 40 miles below Dowlutabad. Supplies to almost any extent and every description might be drawn

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Dowlutabad *(continued.)*	15	S. E.	from the district of Furrah. A son of Kamran, with the title of Saadut-ool-Moolk, resides at Furrah, and is the governor of the district. He, like the Subzawaur prince, has not attempted to aid his father.
Checkaub,	22	S. E. by E.	On the 29th of May, the river was fordable at a point where it was divided into five streams about 300 yards above a large solitary tree which stands on the water's edge, and is remarkable as being the only tree near Dowlutabad. Checkaub is the name given to a fine spring of water, near which was an encampment of Noorzyes. The road from Dowlutabad passable for wheel carriages. No water between the Furrah road and Checkaub, except a few brackish streams. Abundance of water, and a good deal of cultivation, wheat and barley, in the immediate vicinity of Checkaub.
Largebur Kahreez,	9	E.	Gardens $\frac{1}{2}$ mile to the right of the road, with abundance of water. Some encampments of Atchikzyes in the vicinity.
Carwan Cazee,	4	S. E.	Water.
Toot-i-Gusserman,	10	E.	Several encampments near some mulberry trees, which are said to mark the half way distance between Herat and Candahar. Abundance of water and cultivation. Road from Largebur Kahreez hilly and stony, difficult for wheel carriages.
	8	S.	
Gunnee-murgh,	6	E.	Gardens and encampments of Atchikzyes near a fine stream ; country hilly, but road good.
Ibrahim-joee River.	7	S.S. E.	We turned off the main road at this point, and ascended the right bank of the stream.
Tull-i-Kuman.	7	N. E.	Mud fort belonging to Meru Khan, a chief of Noorzyes, on the left bank of the stream. There are about thirty other forts higher up the stream inhabited by the

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Tull-i-Kuman. (*continued.*)	7	N. E.	Baderzyes branch of the Noorzyes. There are two branches of the Noorzyes, the Chulakzyes and the Baderzyes. The head of the former is Mahomed Haleem Khan, (at present in the Persian camp before Herat; he was with Sheer Mahomed Khan when Ghorian was given up to Mahomed Shah,) and Hassan Khan, at present in Herat, is the head of the latter. It is said that the two branches of this tribe muster from 600 to 700 families. There is no such fort as Killa Suffeed, as mentioned by Lieutenant Conolly, and inserted in Arrowsmith's map; but I was told that the Tull-i-Kuman was built upon the site of what has once been the Killa Suffeed, which like all the other Killa Suffeeds, is assigned to the days of Rustam and the white demon. The Tull-i-Kuman is surrounded by encampments, and is used as a keep for the flocks and herds of the chief and his people. In times of danger, these people retire to caves and hiding places in the adjacent hills. The Tull-i-Kuman and its dependent forts are nominally under the authority of the Syfool Moolk, (a son of Shah Kamran,) who resides at Ghore, said to be about 35 miles north of Toot-i-Gusserman, but he has not been able for a long time past to extract any thing from them in the shape of revenue or taxes, and they enjoy their fields and their flocks, without paying any regard to the constituted authority, which is too weak to enforce its demands.
	9	E. S. & S.	Came again upon the high road; abundance of water on the road between the Tull-i-Kuman and this point; passed several gardens and encampments.
Khaushrood River,	6	E. S. E.	A fine stream 20 or 30 yards broad running from the north, fordable; this is the

Names, of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Khaushrood River, (*continued.*)	6	E. S. E.	boundary between Kamran's territory and that of the Candahar sirdars.
Washeer, ..	14	E.b S.	Four forts situated on a fine stream, and surrounded by rich cultivation and gardens.
Byabanck, .	24	E.	Village with a stream from a *kahreez*. The road in some places rugged, but passable for wheel carriages. No fresh water during the first 10 or 12 miles. This road is to the south of that followed by Conolly, which leads through the villages of Poosand and Numzand.
Dooshaukh,	5	E.	Village surrounded by a mud-wall and towers.
Lur, ..	$3\frac{1}{2}$	E.	Deserted fort with a stream from *kahreez*; no encampments in the vicinity.
	7	E. S. E.	Stream near a deserted fort, and some encampments of Barukzyes. Road perfectly level.
	4	E. S. E.	Fort small, but strong and in good repair. This fort was built by Futteh Khan Barukzye for his mother, who is said to have held a petty court here. Abundance of water.
Girishk, ..	21	S. E.	The fort of Girishk is built upon a mound about two miles from the right bank of the Helmund. Girishk is a place of considerable strength, and if properly garrisoned, would require a force of three or four thousand men, with a small train of artillery, (4 iron guns and 2 or 3 mortars would be sufficient,) to ensure its capture. There are four or five old guns in the fort, but they appeared to be in an unserviceable state. Between the river and the fort is a fine *chummun*, (pasture land,) intersected by water-courses, and dotted with gardens, and graves, and villages. The country round the fort might be easily flooded, and the approach to it thus rendered exceeding-

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Girishk, .. *(continued.)*	21	S. E.	ly difficult to a besieging force. Mahomed Siddick Khan, a clever intelligent young man, one of the sons of Sirdar Kohundil Khan, (the eldest of the Candahar brothers,) rules at Girishk, and is the governor of the frontier district. He is attempting to form a corps of infantry, to be drilled and disciplined after the European manner. I saw about a hundred of his recruits, armed with sticks in lieu of muskets, being drilled by a fellow who looked very much like a runaway sepoy dressed in a gay English uniform. When I passed through Girishk, Mahomed Omar Khan and Mahomed Osman Khan, two sons of Kohundil Khan, were encamped in the vicinity, with about two hundred followers, on the way to join the Persian army before Herat. The measure was most unpopular, and it was given out that after a sufficient force had been collected, the young chiefs would in the first instance undertake a plundering expedition against Furrah and Subzawaur.
Rood-i-Helmund, .. (River,)	2	E.	The *Etymander* of the ancients. Broad and exceedingly rapid river not fordable at this season. The distance between the banks is about a thousand yards, but in spring it is said to spread itself over the low ground on its right bank, and sometimes to approach within a few hundred yards of the walls of Girishk. The Helmund takes its rise in the mountains to the west of Cabool, and after a course of 600 miles, during which it is joined by several considerable streams, the principal of which are the Turnuk, the Urghundab, the Shah Bund and the Khaushrood, it falls into the lake of Tumah. There is usually a small boat at this place, by which travellers cross the river when the stream is not fordable; but this

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Rood-i-Helmund, (River,) (*continued.*)	2	E.	had been destroyed a short time before our arrival, and we crossed the river on an elephant, the water being in some places about seven feet deep, 3d June.
Khak-i-Chanpan,	24	E. S.E.	A grove of mulberry trees with a small stream; there is no water between the Helmund and this place.
Kooshk-i-Nakhood,	7	E.b S.	A great deal of rich cultivation, and several fine groves and gardens in the vicinity. Abundance of water. The ruins of an ancient fort called the Killa-i-Nadir, which must have been a place of considerable strength in its day, about 2 miles to the west of Koosh-i-Nakhood.
Houz i-Muddud Khan.	14	E.	A large tank on the right of road.
Candahar,	26	E.	The Urghundab, a fine stream about half a mile to the right of road, the banks of the river thickly studded with gardens and villages. The Urghandab after passing Candahar, takes a westerly course as far as the Houz-i-Muddud Khan, and then turns to the South, not as it is laid down in Arrowsmith's map. The road from the Houz to Candahar passes through a succession of fields, and gardens, and villages, which cover this fertile and delightful valley, the breadth of which varies from 3 to 9 miles. Nearly the whole of the water of the Urghundab is taken off by canals, for the purpose of irrigation. The route by which I travelled from Herat to Candahar, was nearly the same as that followed in 1828 by Lieutenant Conolly, to the accuracy of whose statements and descriptions, I can bear ample testimony. I calculated the distance to be 380½ miles by the average rate of a fast-walking horse, which I found to be 4 miles an hour on level ground. The journey is performed by horsemen in ten and sometimes in nine days, but ca-

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Candahar, (*continued.*)	26	E.	ravans of laden mules are usually from sixteen or eighteen days between Herat and Candahar. The country is occupied by pastoral tribes, chiefly of the Noorzye, Atchikzye and Barukzye branches of the Dooranee Affghans. They are possessed of numerous flocks and herds, and in the vicinity of their *khails* or encampments, they raise a sufficiency of grain for their own consumption. These *khails*, which generally consist of from fifteen to fifty tents, are scattered over the face of the country, and as they are usually at some distance from the road, it is impossible for a mere traveller even to make a rough guess at the extent of population, or the amount of the resources of the country. To the South of the route above described, is another which passes through Bakwa, and which was followed by Forster in 1783, since which time I believe no European has travelled it. The Southern, or Dilaram road, as it is usually called, is described as being perfectly level, and not more than forty or fifty miles longer than the Northern or more direct one; but there is a scarcity of water on it, some of the halting places being upwards of thirty miles apart. It is however travelled by caravans and horsemen, and for an army it would have the advantage of passing within a short distance of Furrah and Subzawaur, from which places supplies almost to any extent are procurable.

The city of Candahar is of an oblong shape, the length, North and South, being about 2,000, and the breadth 1,600 yards. The city is enclosed by a mud wall with circular bastions at regular intervals. The height of the walls may be about thirty feet, the ditch is dry, and from ten to sixteen feet deep, and fifteen broad, in some places less. A

wall loopholed for musquetry, about six feet high, runs round the scarp of the ditch, between which and the main wall, is a level place or *fausse braye*, eight or ten feet in breadth; the works are in tolerable repair.

Candahar is surrounded by gardens and enclosed fields, which would afford cover to a besieging force almost up to the edge of the ditch. About a hundred yards from the S. W. angle, is a large walled garden, which was taken possession of by Shah Shooja in his attempt upon Candahar in 1834, and which formed a strong advanced post for his troops.

Candahar is a place of no strength, and might be taken by escalade; but should this be deemed a hazardous experiment, four iron guns 12 or 18-pounders, would effect a practicable breach in the course of a day's firing.

Three or four mortars (8 and $5\frac{1}{2}$ inches) should be added.

Supplies almost to any extent may be drawn from the surrounding country.

Names of Stations, &c.	Distance in Miles.	Direction.	Remarks.
Kulla-i-khalek-dad Khan,	13	E. and E.N.E.	A half ruined village. Road for the first two or three miles led through gardens and cultivation, after which we travelled over an open uncultivated plain. Good level road free from stones; water only amongst the gardens and cultivation.
Kulla-i-Azim Khan,	3	E b N.	A small fort in tolerable repair, with a stream of clear water.
	8	E b N.	Opening in a low range of hills.
Khail-i-Akhoond, or "Dominie's" Khail,	7	E.N.E.	Road good, but stony.
	..	N.E. b E.	A few houses built round the tomb of a sainted school-master, situated on the right bank of the river Turnuk. The course of the Turnah, (N. E. and S. W.) is marked by a green line of tamarisk trees. A good deal of cultivation round the village.

Names of Stations, &c.	Distance of Miles.	Direction.	Remarks.
Bivouac on the right bank of the Turnuk,	20	N. E.	Road excellent. Cultivation the whole way, but no villages or *khails* to be seen, the people having retired from the vicinity of the highway, to avoid the extortions of the great men who frequent the road.
Teer Andaz,	4	N. E.	A minaret about 40 feet high on the right of the road, said to mark the spot where an arrow of Ahmed Shah's fell, when that monarch was shooting from an eminence, which is pointed out on the left of the road.
Khower Taneh,	16	N. E.	No habitation to be seen. Bivouac on the right bank of the Turnuk, in the district of Khower Taneh, two or three miles beyond the minar, at a place called "Jalloogeer," or "the bridle full," the road bad and stony; for a short distance with this exception, the road perfectly level and good, following the right bank of the Turnuk. The valley of the Turnuk is now, (12th June,) a sheet of waving corn ripe for the sickle.
Julduk, ..	4	N. E.	A village surrounded by gardens, about a mile to the left of the road.
Ford, ...	8	N. E.	Crossed the Turnuk near a mill, which marks the boundary between the country of the Dooranees, and that of the Ghiljees.
			Here we diverged from the direct road, which leads along the right bank of the Turnuk, and passes Kelat-i-Ghiljee, but which is now seldom taken by travellers, in consequence of its being infested by robbers, or lawless Ghiljee chiefs, who either send their followers to attack caravans, or levy contributions themselves, under various pretences. The principal of these are, the sons of one Shaabadeen Khan, and are considered as the chiefs of this part of the country. They are upwards of twenty in number, and are seldom mentioned by their own names, being gene-

Names of Stations, &c.	Distance of Miles.	Direction.	Remarks.
Ford, ... (*continued.*)	8	N. E.	rally called "Buchachaee Shaabadeen," the sons of Shaabadeen. They reside at Kelat-i-Ghiljee and in the forts of this district, between the territories of the Ameer and the Sirdars, and are uncontrolled by either, although nominally their country is under the rule of the latter.
Kulla-i-Ramazan Khan, ..	8	E.b N. E.N.E.	A small fort. Our route from the river lay amongst low hills—road stony, but passable for wheel carriages. Black mail was levied of us at this place by Shaabadeen's men, who had heard of our being in the vicinity.
Koorrum, ..	22	N. E.	Small garden and *khareez* in the district of Koorrum. Passed several forts and *khails* with slips of cultivation. At the 14th mile Deewalik, a ruined fort, which is said to have been once a considerable place. As far as Deewalik the country is inhabited by the Hotukee branch of the tribe of Ghiljees—the district of Koorrum is inhabited by *Takhees.* The river Turnuk two and three miles distant behind some low hills to the westward.
Kulla-i-Jaafferee,	30	N. E.	Several forts; the road from Koorum over undulating ground, passable for wheel carriages. *Khails* and forts on either hand, but at some distance from the road. At the 8th mile, *Gloondee,* said to be a large village. We passed it in the dark, the residence of one of the sons of Shaabadeen. At the Kulla-i-Jaafferee, we again entered the valley of the *Turnuk.* Forts and *khails* are seen in every direction—rich fertile tract of country on the banks of the stream.
Ford, ..	11	N. E. WNE.	Crossed the Turnuk, water reaching to horses' knees.
Gadh or Ghar,	1	..	The first fort of the district of Mookoor, which forms a part of the government of Cabool.

Names of Stations, &c.	Distance of Miles.	Direction.	Remarks.
Source of the Turnuk, ..	16	NNE.	Several fine springs under a range of hills; road for the last ten miles lay through fields of waving corn, (wheat and barley,) clover and *madder*. Forts thickly spread over the country, and abundance of water at every step. These forts form the district of Mookoor. Road level and free from stones.
Kareez in the district of Obeh or Oba,	14	NNE.	Road sandy. Obeh is a pastoral district, the whole plain covered with flocks of sheep and goats, and droves of camels, but few forts are to be seen. Some *khails* under the hills, on either side of the road, at the distance of 6 or 8 miles.
Chardeh, ..	16	NNE.	One of the thousand forts of the fertile district of *Karabagh*, which is chiefly peopled by Hazarehs. The whole country as far as the eye can reach, one large field of wheat. The harvest is gathered in, early in July.
Khareez, ..	6	N. E.	Good level road.
Khareez, ..	2	N. E.	Road execrable, sandy and large round stones.
Water Mills,	16	..	In the district of Nanee. Between this district and Karrabagh is that of Moorakee, which is said to be very populous, and to contain many forts, but I saw nothing of it, as I passed it in the dark.
Chehl Buchagân, ..	8	N. E.	Fine grove; a place of pilgrimage, road good, numerous villages chiefly on the right, inhabited by the Underee division of the Ghiljees; the whole plain covered with green wheat and fine clumps of trees. Abundance of water.
Ghuznee, ..	4	NNE.	The present town of Ghuznee is a small place, not more than 400 yards square, said to have been the citadel of a former town. It was built by the Jagatars 400 years ago, and is situated on the Southern slope of a hill, to the S. W. of two minars, which are said to mark the spot upon which, or near which, stood the bazar of

Names of Stations, &c.	Distance of Miles.	Direction.	Remarks.
Ghuznee, .. (*continued.*)	4	NNE.	Sultan Mahmood's city. The walls of modern Ghuznee are lofty, and stand upon a *khahreez* or *fausse braye*, of considerable elevation, but the ditch is narrow, and of no depth, and the whole of the works are commanded by some hills to the N. E. and N. of the place. At the Northern and upper end of the town is a hill, upon which has been constructed a small citadel, forming the palace of the governor, (Gholam Hyder Khan,) a son of Ameer Dost Mahomed. I saw one large unmanageable gun and four smaller ones, as I passed from the gate of the town to the citadel. I had no opportunity, however, of examining their state. The approach to Ghuznee from the South is highly picturesque, and the citadel, from its great height, looks formidable. The river of Ghuznee flows from the North under the Western face of the town; it supplies the place and the surrounding country with an abundance of water. Ghuznee may contain 900 to 1000 families of Taujiks, Dooranees, and Hindoo shopkeepers and merchants. As Ghuznee commands the high road between Candahar and Cabool, it would be necessary that a force advancing from the former upon the latter place, should take possession of it; but this could be easily accomplished, as the works are of no strength, and are commanded as above-mentioned.
Tomb of Sultan Mahomed,	2	N. E.	This celebrated place of pilgrimage is situated in the midst of a large village, surrounded by fine gardens with several running streams.
	6	N. E.	Narrow defile, called the Tung-i-Sheer, a very strong position, but I believe it may be turned.
	$1\frac{1}{2}$	N. E.	End of Pass.
Shushgao,..	$2\frac{1}{2}$	N. E.	Village, water, and cultivation.
Sydabad, ..	23	W.	Village. The country between Shushgao

Names of Stations, &c.	Distance of Miles.	Direction.	Remarks.
Sydabad, .. (*continued.*)	23	W.	and Sydabad highly cultivated, a fine valley between low hills, villages at every step, abundance of water. Road good, but stony in some places.
Logur River,	4	..	Bridge called the Pull-i-Shaikhabad. The Logur river runs here from N. W. to S. E. crossing the valley, and entering some hills to the Eastward.
Top, ..	6	N.	Village.
River of Cabool, ..	12	N.	Ford. Rapid stream, about 20 yards broad, water at this season (June) stirrup deep. The Cabool river comes from a break in the hills to the N. W. of this point, and runs in a South Easterly direction, through a similar break called the Tung-i-"Lullunder," in the Eastern range.
Mydân, ..	½	N.	A collection of villages to the left of the road, rich cultivation, abundance of water. The country between Ghuznee and Mydân is chiefly inhabited by Wurdeks, who claim descent from the Imaum Zeinalabadeen; they number about 12,000 families, and pay 90,000 rupees to government; they are divided into three branches. 1. Malyar Chief,.. ....Koorum Khan. 2. Noaree ditto .. .. ..Tein Khan. 3. Meer Khail ditto ..Jan Mahomed Khan.
Urghundee,	9½	EN. E.	Several fine villages forming the district of Urghundee, about a mile to the North of the high road.
Cabool, ..	14	E.	Half way from Urghundee, the village of Kulla-i-Hajee. From this place to the city, the road passes through a succession of gardens and fields; the whole country intersected by water-courses, brought from the river of Cabool; road excellent, villages and gardens as far as the eye can reach. The approach to Cabool from the West, is through a narrow defile, which forms as it were the Western gate of the city; and

Names of Stations, &c.	Distance of Miles.	Direction.	Remarks.
Cabool, .. (*continued.*)	14		through this defile, runs the river of Cabool, which afterwards flows through the centre of the city. The hills on both sides have been fortified with lines of wall, flanked at regular intervals by massive towers; but the works which have fallen to decay, are too extensive to be properly defended, and the height may be easily turned. The citadel or Bala Hissar, situated at the Eastern extremity of the city, is a place of no strength, being commanded by heights in the vicinity. There are about 40 guns in Cabool, most of which are in a serviceable state. The route between Candahar and Cabool above described, is generally blocked up by snow during four months of winter, but at the other seasons good, and passable for all descriptions of wheel carriages. Water is abundant, and supplies are procurable at any season, for an army of 20 or 30,000 men. A caravan travels between Candahar and Cabool in fifteen days, but horsemen perform the journey in 8 days, and couriers in 6. I estimated the distance at 317 miles, but the direct route via Kelat-i-Ghiljee is shorter by about ten or fifteen miles.
Cabool Bool,	12	E.b N.	Village—road good, through gardens and fields.
Khak Teezee, ..	25	S. E. & E.	Ditto, situated on the skirt of a range of lofty hills. At the 4th mile, entered a defile called Tung-i-Khoord Cabool, about 3 miles in length. Ascended a small stream, which is crossed by the road every 50 yards. After passing the defile, the road enters an open country, the village of Khoord Cabool two miles to the right. Twelve miles beyond Bootchak, another defile. Road hilly and stony; in some places impassable for guns.

Names of Stations, &c.	Distance of Miles.	Direction.	Remarks.
Khak Teezee, .. (*continued.*)	25	S. E. & E.	Between the second defile and Teezee, the road passes over the *Huft Kothul,* or seven Passes. Khood Buksh Khan is the chief of this district.
Hissaruk, (Pissaruck of Arrowsmith's map?)	17	E. b S.	Cluster of villages on the Soorkhrood stream. After leaving Teezee, steep ascent for about 5 miles, mountains covered with pine and holly oak, magnificent scenery, road impassable for guns, abrupt descent for about two miles; the road or pathway in the bed of a mountain stream. The Soorkhrood flows from a break in the mountains to the East of Hissaruk. The skirt of these mountains, covered with gardens and villages.
Ishpan, ...	4	E.S.E.	Village on the left of the road. Between Cabool and this place the country is inhabited by Ghiljees, but we here enter the districts peopled by *Khogianees.* Forded the Soorkhrood, clear rapid stream near Hissaruk, water at this season (June) stirrup deep, and about 20 yards broad. The Soorkhrood after being fed by numberless mountain streams, which come down from the ranges called *Suffeed Koh,* joins the Cabool river near Jellalabad.
Mookoor Khail,	12	E. b S.	Large village. Abundance of water; fine cultivation, road stony, but passable for wheel carriages, crossed several mountain streams, running from South to North.
Wurzeh, ..	14	E.S.E.	Village in a valley running down from the Suffeed Koh. Abundance of water, gardens and cultivation. After leaving Nookoor Khail, the road descends into a valley with a mountain stream flowing through it. Road stony and bad; villages and gardens on the Southern side of the valley. At the 6th mile passed the celebrated garden of *Neemla,* about a mile to the left; at the 10th mile, villages and gardens on the skirts of the Suffeed Koh range.

Names of Stations, &c	Distance of Miles.	Direction.	Remarks.
Agaum, .	7	E.S.E. & S. E.	Village, situated in a valley similar to that of Wurzeh. Fine stream, gardens, and rich cultivation. Villages as far as the eye can reach. Road stony, but passable for guns. Sirdar Mahomed Akbar Khan, a son of Ameer Dost Mahomed Khan, was encamped with his troops in the valley of Agaum. This young man although not the eldest, is said to be possessed of more power and influence than any of the other sons. He has acquired a high character for courage, and he certainly displayed this quality in the affair of Jumrood. The government of Jellalabad has been entrusted to him, and if he is not greatly respected by the people, he is certainly the least unpopular of the family. His immediate dependents are said to be devoted to him. His troops were scattered in the different villages near Agaum, when I passed through that place, but I believe he has twelve guns, chiefly 6-pounders, in a serviceable condition; a corps of about 1500, Jazayurchees, a fine body of men armed with long heavy guns which are fired from a rest, and will carry a ball four hundred yards with precision, and two or three thousand good horses.
Jellalabad,	24	NNE.	Village. The road or rather pathway for the first six miles led through gardens and rice fields, the whole country flooded for the purpose of irrigation, impassable for guns. There is, however, a gun road, which makes a circuit of some miles between Agaum and Jellalabad, the remainder of the road passable for wheel carriages.

Jellalabad is situated on the right bank of the Cabool river, which is here a stream of considerable volume, and about half a mile broad. Round Jellalabad are the remains of a wall of considerable extent, but the place is now reduced to a mere village, surrounded by extensive ruins.

The various routes between Jellalabad and Peshawur have been already minutely described. At this season of the year (June,) the river route is generally followed, as being the safest and most expeditious. Rafts are formed of splinters of wood, which hold together from twenty to a hundred inflated bullock skins, and an accident rarely happens during the months of May, June and July, when the water is of sufficient depth to cover the rocks, which are dangerous at other seasons. Near Jellalabad, the river runs in a broad bed with low banks on each side; distant hills with snow on their summits on either hand. The space between the foot of these hills and the river, covered with villages and green fields. Fine groves of trees scattered along the banks. The stream, when I passed down, was running at the rate of six or seven miles an hour. A few miles below Jellalabad, the Cabool river is joined by a broad and rapid stream of considerable volume, called Durya-i-Koower. The distance between Jellalabad and Peshawur by the river route, is about 90 miles. This distance is performed on a raft of 25 skins, impelled by two large oars, in about twelve hours. Half way is the large village of Lalpoor, situated on the left bank of the river, the residence of Saadut Khan, chief of the Momund tribe, which is said to number 4,000 families. After passing Lalpoor, the river flows for about thirty miles in a deep narrow channel, walled in by precipitous rocky mountains of great height. In this part of the river are most of the whirlpools and dangerous places. One called the *Shutr Gurdun*, or camel's neck, 26 or 27 miles below Lalpoor, is particularly dreaded by the raftsmen, and is considered even in the best season a place of peril. Two or three miles below *Shutr Gurdun*, the river debouches from the mountains, and enters an open cultivated country. At the village of Muchnee, on the left bank, tolls are levied on rafts passing down the river. From Muttee, a small village on the right bank of the river, seven or eight miles below *Shutr Gurdun*, Peshawur is distant about 14 miles. The country was overflowed for the purpose of irrigation, and the road which passed through a succession of rice fields, was scarcely passable to laden ponies.

I need say nothing of the present state of Peshawur, or of the route through the Punjaub from that place to Loodhiana, both having been minutely described by others.

Appendix to Mr. Blyth's Report for December Meeting, 1842.

[Continued from vol. XII, p. 1011.]

Mynahs.—In Vol. XI, p. 178 *(bis)*, I thought it necessary to describe the two Hill Mynahs of India (genus *Gracula*, v. *Eulabes*, Cuv.), and I have now approximated to these my *Ampeliceps coronatus* (vide XI, 986): perhaps an enumeration of the other Indian Mynahs will not be unacceptable. These vary considerably in form and habit, and may be resolved into different minor groups. The genus *Pastor*, Temminck, apud G. R. Gray, is typified by *P. roseus*; and *Acridotheres*, Vieillot, by *Acr. tristis*. I shall begin with the more bulky, heavy-formed species, which seek their food chiefly or wholly on the ground. Of these, the two first are distinguished by having a large naked space under and beyond the eye.

1. *Acr. tristis*, (Gm.) Vieillot; *Pastor tristoides*, Hodgson, mentioned in *J. A. S.*, V. note to p. 773. (Common Mynah.) Everywhere abundant throughout India in the vicinity of human abodes and cultivation, and remarkable for its familiarity. It rarely nidificates except in the cavities of buildings.

2. *Acr. ginginianus*; *Turdus ginginianus*, Latham; *Gracula grisea*, Daudin; *Cossyphus griseus*, Dumeril. (Bank Mynah.) Common in Bengal (though not in the immediate neighbourhood of Calcutta), Nepal, Assam, and in the Tenasserim provinces; but has never been observed by Mr. Jerdon in the Indian peninsula. It frequents the vicinity of water, at least during the breeding season, when it builds in holes in river-banks. The frontal feathers are erectile, forming a slight crest less developed than in the two next species, and those on the sides of the head are directed towards the median line. The young are plain greyish-brown, much as in the immature *Sturnus vulgaris*, but exhibit a whitish wing-spot and tips to the tail-feathers, and the plumage of the sides of the crown is disposed as usual. This species may generally be obtained of the Calcutta dealers.

The two next retain the bulky form of the preceding, but have no naked space on the face, and the frontal feathers stand up, forming a short and laterally compressed crest.

3. *Acr. cristatellus; Gracula cristatella*, Lin.; *Pastor griseus*, Horsfield; *P. cristalloides*, Hodgson, *J. A. S.*, V, note to p. 773. (Sub-crested Mynah.) Common in Bengal, Nepal, and eastward to the Chusan Archipelago, also in the Burmese and Malay countries; but replaced in Southern India by the next species. Always nidificates in the hollows of trees.

4. *Acr. fuscus; Pastor fuscus*, Temminck, apud Griffith's work; *P. Mahrattensis*, Sykes. (Dusky Mynah.) Closely allied to the last, but smaller, with the upper-parts inclining to brown instead of ashy, and the irides greyish-white instead of bright yellow. Southern India.

Acr. fuliginosus, Nobis. In a collection of bird-skins procured in the vicinity of Macao, are two specimens of a Mynah allied to *Acr. cristatellus*, but obviously distinct in species, though being in a transitional state of feather from the immature to the adult garb, the latter cannot be fully described at present. Length about ten inches, of wing five and a quarter, and tail three inches; bill to gape an inch and a quarter, and tarse an inch and a half. The new feathers of the upper-parts were coming dusky-cinereous, of the breast and flanks a purer dark cinereous, resembling in hue the fore-neck and breast of *Acr. cristatellus*: the belly and vent are uniformly coloured with the rest of the under-parts, and the lower tail-coverts are blackish, whereas in both the preceding species these are nearly or quite white at all ages: the nestling plumage of the head is blackish, and the form of the feathers indicates that these would be slender and elongated in the adult, which has probably a slight frontal crest less developed than in *Acr. cristatellus;* the new feathers of the wings are bronzed black, except the base of the primaries and the coverts impending them, which are white: tail wholly blackish: the beak is less compressed than in *Acr. cristatellus*, and the tip of the upper mandible is more distinctly incurved and emarginated; the colour of both mandibles would seem to have been orange at base, and white for the terminal half: the legs apparently have been yellow. There is no naked skin upon the face; and its superior size, with the total absence of white upon the tail and its under-coverts, distinguishes this species readily from *Acr. cristatellus* of any age.

The next are smaller and lighter-formed, more allied to *Sturnus*, but having a shorter and more compressed bill. Their habits are much

more arboreal, as they seek their food upon trees, and are very rarely seen on the ground. They constitute the *Sturnia* of Lesson.

1. *St. pagodarum ; Turdus pagodarum*, Lin. (Brahminee Mynah.) Body greyish, the ear-coverts, neck, and under-parts, bright buff, with mesial streaks to the feathers of different texture ; the cap black, and bearing a long pendent crest of slender pointed feathers ; thighs, lower tail-coverts, and tips of the outer tail-feathers, white. Female rather less deeply coloured, with the crest not quite so long: and young yellowish-grey, inclining to pale buff on the throat and breast ; the cap at first concolorous or nearly so, afterwards dusky-black and not crested. An abundant species in the Carnatic, and occasionally observed in other parts of Southern India: in Lower Bengal it is chiefly met with towards the close of the cool season, frequenting the arboreal cotton then in blossom. It may often be obtained of the Calcutta birddealers.

2. *St. Malabarica : Turdus Malabaricus*, Gm., but not *Pastor Malabaricus*, apud Jerdon, *Madr Jl.* XI, 22, which refers to the next species.* (Grey Mynah.) Upper-parts grey, the forehead and throat whitish, the former occasionally pure white ; and entire under-parts from the fore-neck ferruginous-buff, deep and bright-coloured in old males, and comparatively very faint in the younger females; primaries slightly green-glossed black and tipped with grey, and the middle tail-feathers greyish, the rest dusky, successively more broadly tipped with deep ferruginous. The wings and tail, and in fact the plumage generally, are quite those of a typical *Sturnus*. Young pale greyish, lighter underneath, with rufous tips to the outer tail-feathers. There are few birds which abrade their plumage so much by the time the moulting season comes round : the colours fade, and even make a near approach to uniformity. It is very common in Bengal, Nepal, and Assam, but apparently rare or perhaps local in the peninsula of India.

3. *St. dominicana (?) ;* olim *P. malabaricus* apud Jerdon.† (White-headed Mynah.) Closely allied to the preceding, but dis-

*According to Mr. Jerdon, the *Pastor nanus* vel *Gracula cinerea* of Lesson's *Traité* appears to refer to this species.

† No doubt the *Pastor dominicanus* apud Lesson, *Voy. de Bélanger*, stated to be tolerably common on the Continent of India ; but its identity with the Philippine species so named, remains I suspect to be ascertained. In a letter just received from Mr. Jerdon, that naturalist remarks that "*Pastor dominicanus*, as described by Lesson [in his *Traité ?*] can never be my *malabaricus*."

tinguished structurally by its longer tail, and in colour by having the whole head, neck, throat and breast, silky-white, the back of a more albescent grey, and the primaries plain black; the flanks, belly, lower tail-coverts, and a portion of the tail, being alone rufous. Inhabits Southern India, and especially the lofty jungles of the Malabar coast, so that the name *malabaricus* is better applicable to this species than to the preceding one. Gmelin, it may be remarked, in his long and heterogeneous list of species assigned to the genus *Turdus*, has described two very different species by the appellation *T. malabaricus*, namely, the preceding bird and the *Phyllornis (v. Chloropsis)* modernly so named (XI, 957).

St. elegans; Pastor elegans, Lesson, *Voy. de Bélanger*, p. 266. This is a beautiful species of the present group, inhabiting Cochin China and the Malay peninsula. Colour glistening grey, the forehead, lores, and throat, medial part of wing, rump, tail-tip, with the belly, flanks, and lower tail-coverts, bright golden-ferruginous; fore-part of wing white, and the hinder half, brightly bronzed black; base of tail also black; bill lead-coloured, and tarsi yellow. According to M. Lesson, "this species was named *P. Chinensis*, by Temminck, in Kuhl's Catalogue of Daubenton's *Planches Coloriées*; it is both *Oriolus Sinensis*, sp. 44, and *Sturnus sericeus*, sp. 8, of Latham; and Daubenton's figure, pl. DCXVII, where it is termed *Kink* of China, is so bad as to give a false idea." More or less of this is certainly erroneous. I have now before me specimens of both sexes of the true *Sturnus sericeus*, Latham, received from Chusan, being evidently that described as such by Shaw and in the *Dict. Class.* It is a larger bird than any of the preceding members of this group, with a stronger bill less laterally compressed at tip, and may be thus distinguished:—

St. sericea. Length nearly nine inches, of wing four and three-quarters, and tail two inches and five-eighths; bill to gape an inch and one-eighth, and tarsi an inch. Upper parts of male fine glistening ashy, the wings and tail bronzed green-black, excepting the coverts of the primaries which are white; entire head, throat, and fore-neck, a silky subdued white, the feathers of the crown slender and elongate: rest of under-parts somewhat paler ashy than the back, the middle of the belly, under tail-coverts, and fore-part of the under surface of the wing, white: bill coral-red with a black tip; and legs

bright yellow. Female rather smaller, having the ash-colour of the male replaced by brown, pale on rump, and the head and throat dingy whitish, passing into ashy-brown on the occiput. A handsome species, with delicate silky plumage.*

St. cana, Nobis. I can only describe this species from an imperfectly moulted specimen received from Macao. Length about seven inches, of wing three inches and seven-eighths, and tail two inches and three-eighths; bill to gape an inch, and tarse seven-eighths of an inch. Colour of the new feathers of the crown and back plain brownish-ash, and of those of the breast and flanks the same but much paler and delicately tinted, all being rounded as in the nestling plumage, not slender and elongate as usual in this group; throat and belly albescent: the unshed nestling feathers are uniformly of a paler or browner grey above, and lighter-coloured below: wings and tail darker, the primaries and middle tail-feathers glossy nigrescent: some of the larger coverts upon each wing towards the scapularies are white in the specimen, which however I conceive to be partial albinism, and not to be a constant character; but the coverts of the primaries are also white for the greater part of their outer web, which is more probably normal: tertiaries brownish and pale-edged, and the outer tail-feathers whitish towards their tips: bill yellowish, mixed with dusky; and legs appear to have been sullied yellow. This is obviously a distinct species from any of the foregoing.

The *Pastor tricolor*, Horsfield, *Lin. Trans.* XIII, 155, v. *P. melanopterus*, Wagler, is probably another species of this group inhabiting Java.

According to Mr. G. R. Gray (*List of the Genera of Birds*, 2nd edit.), the type of the genus *Pastor* is *P. roseus*, (Lin.) Tem., which is very common in many parts of India, but visits the neighbourhood of Calcutta only towards the end of the cool season, when flocks of this species and of *Sturnia pagodarum* are not unfrequently observed upon the arboreal cotton then in blossom. Nearly related to this, according to M. Lesson, is a Peguan species, *P. peguanus*, Lesson,

* In Mr. Strickland's catalogue of some Chinese birds exhibited in London (*Ann. and Mag. Nat. Hist.*, *Sept.* 1843, p. 221), the above species is termed *Acridotheres sericeus*, with the remark, that it "is quite distinct from *A. dauricus*, Pall., with which it is united by Wagler." To which of the minor groups this *A. dauricus* should be referred, it is not easy to divine from the description of it.

having "*les plumes capistrales courtes et serres*,": it would seem to connect the present form with *Sturnia*. Mr. Eyton has described a Mynah from the Malay peninsula as *Pastor Malayensis*, *P. Z. S.* 1839, p. 103; and the *Turdus ocrocephalus*, Gm. (Tem., *pl. col.* 136), said to inhabit Ceylon and Java, is referred to the group of Mynahs by Stephens.*

The ordinary Indian Starling, *Sturnus contra* and *capensis*, Auct., *Pastor jalla*, Horsfield, and apparently *P. auricularis* of the *Dict. Class.*, constitutes Mr. Hodgson's division *Sturnopastor:* and the Himalayan Starling, considered to be identical with *St. vulgaris* by most authors, certainly differs considerably from the European bird in the form of its beak, which is longer and more compressed at tip, being drawn out to a much finer point, besides that this organ never turns yellow as in the European Starling: considerable numbers are sometimes sold alive in Calcutta, brought from the hilly regions of Bengal (as Monghyr, &c.), observation of which has led me to conclude that the distinctions above-mentioned are permanent, and therefore to follow Mr. Hodgson in styling this oriental analogue of the common European Starling *St. indicus*.

Finally, there remain two oriental species of *Sturnidæ*, which, though by no means nearly allied, have both been referred to the genus *Lamprotornis*. One is *Calornis cantor*, (Latham) G. R. Gray, v. *Turdus chalybeus*, and *T. strigalus*, Horsfield, which the Society has received from Arracan and the Tenasserim provinces, where it would seem to be very common. What are probably once-moulted females, rather than the young of the year, have the under-parts yellowish-white, with green-black central streaks to the feathers; and in one specimen before me are some mingled under tail-coverts, of an uniform glossy green-black as usual. The other species is *L. spilopterus*, Vigors, figured in Gould's *Century*, an inhabitant of Nepâl and the hill ranges of Assam, upon which Mr. Hodgson founds his genus *Saroglossa*, referring it to the *Meliphagidæ*, and which he characterises as follows:—

* In Griffith's edition of the *Régne Animal*, VI, 422, is described *P. temporalis*, Tem. "Cheeks naked, red; head and streak over eyes pure white; collar black; another near the back white; scapularies and wings black-brown; chest and belly white; wing-coverts white-edged; tail-ends white. Length eleven inches. Bengal," undoubtedly, however, from some other locality.

"Genus *Saroglossa*, H. Bill *Chloropsian*, but stouter. Tongue cartilaginous, flat, furnished with a full brush forwards. Wings considerably acuminated and firm, 1st quill bastard, 3rd longest, 2nd and 4th equal, and rather less than the third. Tail firm, stoutish, subfurcate. Legs and feet strong, arboreal, and subrepatory. Tarsus (to sole) exceeding the mid-toe and claw: heavily scaled to the front; smooth to sides, and cultrated behind. Toes medial, unequal; the hind one large and depressed. Nails acute, well curved, suited for creeping or clinging.

"Type, *Lamprotornis spilopterus*, Vigors.

"Habits monticolous and arboreal, feeding like *Chloropsis*, to which genus and to *Hypsipetes*, *Brachypus*, &c., it has most affinity, both of structure and manners, seeming to represent the Sturnine birds in its own group." I still prefer to retain it among the *Sturnidæ*.

Another group requiring elucidation, and which has strangely been referred by several authors to that of the Mynahs, is the genus of Doomrees (*Malacocercus*, Swainson), and its various allies. This genus was founded on a Ceylon species, identified by Mr. Swainson with the *Gracŭla striata* of the Paris Museum (or *Cossyphus striatus*, Dumeril), and figured by him in his 'Zoological Illustrations' as—

1. *Malacocercus striatus*. It closely resembles one from Southern India, and another from Bengal, Nepal, and Assam; but is distinguished from the first by the absence of the pale longitudinal markings of the feathers of the back and breast, and from the second by the obvious striation of its tertiaries and tail. A Cingalese specimen presented to the Society by Willis Earle, Esq., corresponds exactly with Swainson's figure; the cross-striæ being much more conspicuous than in its Bengal representative, and consisting of rays of a deeper colour seen at all angles of reflection: the under-parts also are more deeply tinged with rufous. Length about nine inches and a half, of wing ten inches, and middle tail-feathers four and a quarter, the outermost an inch and one-eighth less: tarse an inch and one-eighth: the bill to gape an inch only.

2. *M. terricolor*, Hodgson; mentioned as *Pastor terricolor*, H., in *J. A. S.*, V, 771, and also classed by Dr. Pearson among the Mynahs in X, 650. Resembles the preceding species, excepting that all its colours are less brought out, the cross-rays on the tail being faint and inconspicuous, and barely discernible on the tertiaries; a very

weak tinge of fulvous on the abdominal region. Bill an inch and one-eighth to gape. This is one of the most common birds of Bengal, and it is only after examining a considerable number of specimens, that I consider it may be safely separated from *M. striatus*. It extends into Nepâl and Assam.*

3. *M. Somervillei; Timalia Somervillei*, Sykes, *P. Z.* S., 1832, p. 89. The general colour of this species is somewhat darker, with distinct pale mesial streaks on the feathers of the back and breast, which are seen also on the upper-parts of the next species; its tertials are but very obscurely striated, but the tail distinctly so, as in the first: tarse somewhat shorter than in the two preceding. Mr. Jerdon agrees with me in considering this distinct from *M. terricolor*, which it represents in the Indian peninsula, extending northward, according to Dr. Royle's list, to the plains nearest Saharunpore; but the species of this group approximate so very closely, that it is necessary to be most cautious in identifying them. Indeed, the present one is not improbably the original *striatus*, although not that of Mr. Swainson.

4. *M. griseus; Turdus griseus*, Latham; *Timalia grisea*, Jerdon, *Madr. Jl.* No. XXV, 258. This is another peninsular species, also closely related to the foregoing, but readily distinguished by its inferior size, yellowish-white crown or whole top of the head, and dark throat. Common in the Carnatic, and found sparingly in the more open portion of the West Coast.

A race allied to this was met with in the Southern Mahratta country by Mr. Elliot, being described by him to have whitish legs and feet, instead of yellow (vide *Madr. Jl.* No. XXV, 259). Mr. Jerdon has never observed *A. griseus* above the Ghauts.

* No doubt the *M. striatus* of a catalogue of Bengal birds published in the *An. and Mag. Nat. Hist.* 1843, p. 447.—It is also, I perceive from Edwards's *description* of his "Brown Indian Thrush," which was "brought from Bengal in the East Indies," decidedly the species intended by him: the figure, too, being chiefly faulty in attitude, while the colouring of it is enough to mislead any one. Upon this figure and description is founded *Turdus canorus*, Lin., and the "*Ianthocincla canora*, (Lin.)", of Mr. Strickland's list of some Chinese birds exhibited in London, *An. and Mag. Nat. Hist.* 1843, p. 221, is meant to refer to it, but doubtless indicates some other species, probably the *Turdus chinensis*, Osbeck, which Linnæus considered identical with the bird of Edwards. The specific name *canorus* has accordingly the priority for this species, but must be rejected from its extreme inappropriateness: the bird having a most particularly harsh voice *(atch, atch)*, and no pretensions whatever to be musical, in the least degree.

In the following species, the tail is more elongated, narrower, and more graduated:—

5. *M. Malcolmi; Timalia Malcolmi*, Sykes, *P. Z. S.* 1832, p. 88; *Garrulus albifrons*, Gray, in Hardwicke's Illustrations. Elevated lands of Southern India. Cawnpore (?), apud Hardwicke.

6. *M. Earlei*, Nobis. Allied in form to *M. subrufus*, but the beak more compressed, and plumage very different. Length nearly ten inches, of which the middle tail-feathers measure five, the outermost two inches less; wing three and a half; bill to gape an inch and one-eighth, and tarse an inch and a quarter. Upper plumage much as in *M. chatarrhœa*, the frontal feathers however more defined, and less inclining to rufescent, having similar dark central streaks; transverse striæ of the tail-feathers scarcely, if at all, discernible: neck and throat dull-reddish fulvous, the feathers margined paler, and having faint dark central lines: rest of the under-parts dingy albescent-brown. Beak yellowish, and legs also light yellowish. Common in heavy reed and grass jungle in Bengal, and described from a specimen shot in the vicinity of Calcutta by Willis Earle, Esq., to whom the Society is indebted for numerous zoological contributions. Mr. Hodgson has since sent it from Nepal, and Mr. Barb from Tipperah; and it has likewise been procured by Mr. Earle in the Rajmahl district. A young one shot near Calcutta is clad in the flimsy nestling plumage, having the markings generally less distinct, except upon the forehead, and the throat and breast of a clearer pale ferruginous. One of the drawings of the late Dr. Buchanan Hamilton appears to represent this species, and I would have adopted his specific name for it, had this only been a little more euphonious.

7. *M. chatarhœa; Timalia chatarhœa*, Franklin, *P. Z. S.* 1831, p. 118: *Cossyphus caudatus (?)*, Dumeril, vide *Dict. Class: Megalurus isabellinus*, Sw., "Menag." Inhabits bushes and grass-jungle in the peninsula, also, according to Mr. Frith, the extensive reedy tracts covering the churrs in the large rivers of Bengal. Sir A. Burnes obtained it in Scinde.

8. *M. subrufus; Timalia subrufa*, Jerdon, *Madr. Jl.*, 1839, p. 259: *T. pœcilorhyncha*, de la Fresnaye, *Rev. Zool. de la Soc. Cuv.* 1840, p. 65. Tail broader and softer than in the preceding species. Neilgherries.

9. *M. (?) pellotis ; Timalia pellotis,* Hodgson, *As. Res.* XIX, 182. Nepal.

10. *M.* (?) *nipalensis ; Timalia nipalensis,* Hodgson, *loc. cit.* Mr. Hodgson has forwarded two skins as examples of his *T. pellotis* and *T. leucotis,* which latter would seem to be only another name for his *nipalensis,* which is stated by him to have the entire cheeks pure white ; the state of the specimen does not permit me to distinguish it from *T. pellotis,* to which, at all events, it is very closely allied.*

The true *Malacocerci* have been considered peculiar to India, but the *Crateropus Jardinii* of Dr. Andrew Smith's 'Zoology of South Africa' appears to me to belong decidedly to the present group, rather than to *Crateropus v. Garrulax ;* and I should also place here the *Malurus squamiceps* and *M. acaciæ* of Ruppell. The *Timalia hypery-thra* of Franklin, though of very diminutive size, is so closely allied to *M. subrufus,* that I almost think it should be ranged with it:† and of the other reputed *Timaliæ* of Southern India, *T. hypoleuca,* Franklin, is the type of Mr. Hodgson's genus *Chrysomma,* being, I think, separated with propriety, and Mr. Frith informs me that there is a second species of this form in Bengal, additional to *hypoleuca* (vel *Horsfieldi,* Jardine and Selby), from which it differs in being about half larger : the *T. platyura,* Jerdon, approaches more to *Sphenura* than aught else, but cannot well rank therein, its bill much resembling that of *Sph. striata, (J. A. S.* XI, 603,) but the vibrissæ being less develop-ed :‡ and lastly, the *T. poiocephala,* Jerdon, I refer to an extensive Malayan group, exemplified by *Malacopteron,* Eyton, which is my *Trichastoma,* XI, 795, and is hereinafter subdivided, the species in question falling under my division *Alcippe,* p. 384.

Gampsorhynchus, Nobis, *n. g.* Allied to the long-tailed *Malacocerci,* and also to *Sphenura,* but the bill intermediate in form to those of *Turdus* and *Lanius,* and the gape conspicuously armed with straight vibrissæ : it is nearly equal to the head, moderately compressed, the ridge of the upper mandible obtusely angulated, and its outline curv-

* The *Malacocerci* appear all to lay bright blue eggs, at least such is the colour of those of *M. terricolor, griseus,* and *chatarhæa,* in the Society's Museum ; and the *Oxylophus serratus,* which lays a nearly similar egg, but having a greenish cast, resorts to their nests to deposit it in.

† The crest of this species allies it to *Stachyris,* Hodgson, p. 378.

‡ Vide p. 374.

ing towards the tip, which is strongly emarginated, and forms a distinct hook, overhanging the extremity of the lower mandible; nostrils oval, pierced in the fore-part of the nasal membrane; wings and tail graduated, the first primary two-fifths the length of the fifth, which is equal to the sixth and seventh and longest: feet formed for perching, the tarse rather longer than the middle toe with its claw, and the claws but moderately curved: tail elongated.

G. rufulus, Nobis. Length about nine inches, of which the tail is four and three-quarters, and bill to gape above seven-eighths of an inch; wing three inches and a half; and tarse an inch and one sixteenth. Colour of the upper-parts uniform olive-brown: and the head and entire under-parts probably wholly ferruginous; but the only specimen examined is a partial albino, having the head and under-parts white, with a few ferruginous feathers intermixed: bill horn-coloured, the upper mandible dusky above, and the lower pale; and feet light brown: under-surface of the wings pale fulvescent, which also margins the basal portion of the inner webs of the large alars: tail much graduated, its feathers more or less tipped with albescent; rictorial bristles black. Received from Darjeeling.

Orthorhinus, Nobis, *n. g.* General structure of *Pomatorhinus*, but the plumage still more lax and open, the wings more bowed or hollowed, and the feet more decidedly adapted for progression on the ground, having the claws larger and straighter: the bill is less elongated than in the more typical *Pomatorhini*, and is much less compressed, its upper mandible shewing scarcely more than an indication of a curve, and the gonys of the lower mandible ascending posteriorly to the junction of its rami, by which a distinct angle is there produced.

O. hypoleucos, Nobis. Length about ten inches, of which the tail measures four; wing four inches and a quarter; bill to gape one and a half; tarse rather more; hind toe and claw an inch and a quarter. General colour fulvescent olive-brown above, the lower parts white, with traces of dusky terminal spots on the breast; streak backward from behind the eye, and the sides of the neck posterior to the ear-coverts, bright fulvous; sides of the breast ashy, with white centres to feathers: the bill dusky, a little whitish at tip, and beneath the lower mandible: legs pale: the feathers of the crown a little squamose. Inhabits Arracan.

Another Indian genus referrible to the same great series, is *Pellornium* of Swainson, v. *Cinclidia*, Gould; and the only species—*P. rufi-*

ceps, Sw., *C. punctata*, Gould, and *P. olivaceum*, Jerdon,—appears also to claim *Megalurus ? ruficeps* of Sykes as a synonym ; at least his description of the plumage agrees precisely, only he states that the tail is equal and narrow, whence it may be that the outermost pair of *rectrices* were wanting in his specimen. The admeasurements which he assigns, also, are improbable for a bird of this group, whence I suspect that there must be some typographical error ; the minute description of the colouring coincides exactly.* The Society has received specimens of *Pellornium ruficeps* from Mr. Hodgson and from Mr. Jerdon. Very different is the

Megalurus palustris (?), Horsfield, (which is *Malurus marginalis*, Reinwardt ;) *Turdus toklao* of Buchanan Hamilton's drawings, *J. A. S.* XI, 603. This, I believe, is a genuine *Megalurus*. It has a long and much graduated tail, and is remarkable for the considerable difference of size between the male and female. Length of the male about nine inches and a half, of which the tail measures four and three-quarters, its outermost feathers two inches and a quarter less ; wings three inches and three-quarters, and their spread twelve inches ; bill to gape an inch, and tarse an inch and a half: female eight inches and a quarter, of which the tail measures four and a quarter ; expanse ten inches and a half, and closed wing three and one-eighth ; bill to gape seven-eighths of an inch, and tarse barely one and a quarter. Colour much as in the British *Locustella Raii* ;† the feathers becoming extremely worn prior to their renewal, and tail much rubbed away. In new plumage the upper parts are bright olive-brown, with a mesial broad black stripe to each feather of the back and scapularies ; margins of the wing-feathers also brown, their inner portion dusky ; crown rufescent, with mesial dark lines to the feathers, tending to become obsolete towards the front, these coronal feathers being small, rigid, and appressed ; a pale streak over the eye ;

* In a valuable communication from Mr. H. E. Strickland, that naturalist remarks, of Col. Sykes's specimen,—"*Megalurus ruficeps*, Sykes, is not a *Megalurus*, but seems to me to belong to Gould's Australian genus *Hylacola*." The latter would seem, however, from the description in *P. Z. S.* 1842, p. 135, to come very close upon *Pellornium*, and I should not be surprised to learn of their identity. Gould's illustrated work on the 'Birds of Australia,' I have not at present an opportunity of referring to ; but *I think* I can recollect the figures of his two *Hylacolæ*, and that they do closely approximate the *Pellornium*.

† The *Locustella* is indeed more allied to this and proximate genera than to the birds with which it is usually arranged.

and the under-parts are dull whitish, tinged with brown, the breast usually more or less speckled with small linear dark spots; tail brown without markings: bill horn-coloured, the lower mandible chiefly pale, and inside of the mouth light yellowish, with merely a black spot at each posterior angle of the tongue,—but during the breeding season the interior of the mouth is wholly black, and the bill is then of a livid colour, suffused above with blackish: legs dull purplish-brown. In worn plumage, the black portions of the feathers have faded to dusky-brown, and their brown lateral margins have more or less disappeared, what remains of them having faded in hue. The young nearly resemble the newly moulted adults in colouring, but have a strong tinge of yellow on the eye-streak and under-parts, and the lower mandible is chiefly bright yellow; their crown also is devoid of any rufous tinge. The different size of the sexes is very conspicuous when they leave the nest (which is during May). In many respects, this bird resembles the *Sphenura*, but the beak is considerably more slender and elongated, the rictorial bristles are inconsiderable, and the tarse is larger and stronger, with proportionate toes and claws. Both genera have remarkable freedom of action of the legs, enabling them to sprawl widely as they clamber among the reeds and grass-stems, and the black interior of the mouth during the breeding season is common to both, the entire beak also becoming black in the *Sphenura*.*

Of the latter genus, I now suspect, from analogy with the *Megalurus*, that the two supposed species noticed in XI, 602-3, are merely male and female of the same, notwithstanding the considerable discrepancy of size. In all other respects they agree precisely; and of four specimens of the large size which I have now obtained, all proved to be males, while the only example of the small size which I have yet succeeded in procuring, was a female. Mr. Jerdon has lately procured two or three of the small size in the vicinity of Nellore, and it remains to ascertain whether all of these were females. The large measure eight inches and three-quarters long, by eleven across; wing three and a quarter; middle tail-feathers three and three-quarters; bill to gape seven-eighths of an inch, to forehead under five-eighths; tarse

* Mr. Frith informs me, that the *Megalurus* ascends singing, with a fine flute-like voice, to some height above the reeds which it frequents, and then suddenly drops down among them.

an inch and three-sixteenths. The small female gave seven by nine inches; wing two and seven-eighths; tail eight inches, and tarse an inch and one-sixteenth. Mr. Frith has well suggested that the very remarkable ant-orbital bristles of this genus are admirably adapted to protect the eyes when the bird is forcing its way through the dense tufts of high grass and reeds, among which both it and the *Megalurus* are constantly found.

Following the *Sphenura* should rank Mr. Jerdon's *Timalia platyura*, for which I have suggested to him the generic name *Schœnicola;* but I have not a specimen now by me wherefrom to draw up its particular characters. Another allied but distinct form may be designated

Eurycercus, Nobis. General form diminutive of *Sphenura*, but proportionally much less robust; the bill weaker, slenderer, and more compressed; the rictal bristles feeble and inconsiderable: the feet and claws resemble those of *Sphenura*, but are somewhat less elongated: the wings also are shorter and more rounded, having the fourth, fifth, and sixth primaries subequal and longest, the third equalling the ninth, and the first being half the length of the fourth: the tail-feathers are much broader and softer, and extremely graduated; plumage lax and soft.

Eu. Burnesii, Nobis. Length six inches and a quarter, of which the middle tail-feathers are three and three-quarters, the outermost two and one-eighth less, and breadth of middle tail-feathers above half an inch; wing two inches and one-eighth; bill to gape five-eighths of an inch; and tarse three-quarters of an inch. Upper-parts coloured as in the *Malacocerci* generally, or brownish-grey with darker central streaks to the feathers, chiefly apparent on the scapularies and inter-scapularies; tail very faintly barred, only discernibly so in certain lights, having no subterminal band or white tip; under-parts whitish, tinged with fulvescent on the flanks; a shade of the same also on the sides of the neck, where the mesial streaks to the feathers are tolerably distinct; under tail-coverts ferruginous: the upper mandible of the bill is dusky-horn above, the lower yellowish-white; legs yellowish-brown. Inhabits the Indus territories, where obtained by the late Sir Alexander Burnes and Dr. Lord.*

* Both this and the preceding genus are distinct from *Sphenœacus*, Strickland, founded on the *Fluteur* of Levaillant, figured as *Malurus africanus* in Swainson's 'Zoological' Illustrations. *Sphenœacus* should be placed next to *Sphenura*.

The *Suya criniger*, Hodgson, (*As. Res.* xix, 183,) may next be introduced, a form which connects *Sphenura* and its allies with *Prinia*, being again much related to *Malacocercus chatarrhea*: and hereabouts should probably also range the *Cossyphus minutus*, Dumeril, briefly described in the *Dict. Class.* to have "the upper-parts brown; head rayed longitudinally with rufous and brown; under-parts fulvous-grey, with a white throat: length four inches and a half:" and inhabiting India.

The various Indian *Priniæ* are perfectly identical as a group with the African *Drymoicæ* of Swainson, numerous species of which are figured by Dr. A. Smith and by Ruppell, and two or three by Levaillant. Ruppell, or rather his editor Dr. Cretzschmar, adopts *Prinia* (in the 'Neue Wirbelthiere'); but Dr. Smith employs *Drymoica* for the whole series, including the *Pinc-pinc* of Levaillant, upon which Swainson founded his *Hemipteryx*. Referring to Mr. G. R. Gray's 'List of the Genera of Birds', 2nd edit., I find *le Capocier* of Levaillant (*Sylvia macroura*, Lath., v. *Malurus capensis*, Stephens,) cited as the type of the genus, and the date given so far back as 1827; but this must be a typographical error for 1837, when *Drymoica* appears to have been first defined by Mr. Swainson in his classification of Birds published in Lardner's Cyclopædia; at least, there is no mention of the group in Swainson's remarks on the *Sylviadæ* in the 'Fauna Americana-borealis,' II, 201, (1831,) nor in the notice accompanying his figure of *Prinia familiaris*, Horsfield, in the "Zool. Ill.," 2nd series, Vol. III, (1832-3.) In the 'Classification of Birds,' the same author suggests that *Prinia familiaris*, Horsf., is probably an aberrant species of *Orthotomus*; and gives, as the types of *Drymoica*, firstly, *Sylvia cysticola*, Tem., and secondly, Levaillant's *Capocier*: but the former of these, if considered separable, (and if 1837 be the true date of *Drymoica*,) must rank as *Cysticola schœnicola*, (Bonap.) Lesson, who elevated it to the rank of a subdivision in 1831; and the latter would appear to be a true *Prinia*, Horsfield, (1820,) whence the name *Drymoica* becomes inadmissable. To judge from the coloured figures, it would seem that the various African species effect a complete transition from *Prinia* into *Cysticola*, which latter is rather an aberrant form of *Prinia* than a distinct natural group, the particular aberration attaining its ultimatum in *Hemipteryx*, Sw. I shall follow Dr. A. Smith in uniting the entire series,

as Mr. Jerdon and others have done with the Indian species, which are as follow:—

1. *Pr. sylvatica,* Jerdon, *Madr. Jl.* XI, 4. This is one of the most *Timalia*-like, having the bill comparatively deep and compressed. It inhabits the Neilgherries.

2. *Pr. socialis,* Sykes, *P. Z. S.* 1832, p. 89. Indian peninsula. Probably also Bengal, as it is figured in one of Buchanan's drawings, by the name *Sylvia kalaphutki, i. e.* 'Black *Phutky* (or *Foodkey*, apud Latham,) a name by which this tribe is generally known to the natives of India.

3. *Pr. flaviventris; Orthotomus flaviventris,* Delessert, *Souv.* pt. II, 30. Neilgherries; Bengal, Tenasserim, Singapore.* The *Motacilla olivacea,* Raffles, *Lin. Trans.* XIII, 313, is probably allied to this.

4. *Pr. inornata,* Sykes, *P. Z. S.* 1832, p. 89. Very common in the Indian Peninsula, in Bengal, and also in Nepal. The wing varies in length from an inch and three-quarters, or even less, to two inches, and this in specimens from the same locality. That described as new in XI, 883, is, I now think, but a variety of the present species.

5. *Pr. Franklinii,* Nobis; *Pr. macroura,* Franklin, *P. Z. S.* 1831, p. 118, but not *Pr. macroura,* (Latham,) founded on the *Capocier* of Levaillant. "Closely allied to the last, though perfectly distinct; differing in the more reddish or fawn tint of the brown, and the more rufous tint of the white. It is much more rare than the last, and prefers more jungly and wooded places." Jerdon. *Non vidi.*

6. *Pr. Buchanani,* Nobis; *Pr. rufifrons,* Jerdon, *Madras Jl.* XI, 4, but not of Ruppell. Southern India. Probably also Bengal, as it is figured by Buchanan Hamilton.

7. *Pr. Hodgsonii,* Nobis; *Pr. gracilis,* Franklin, *P. Z. S.* 1831, p. 119, but not *Malurus gracilis* of Ruppell, (figured also by Savigny,) which pertains to the present group. A Nepalese specimen forwarded by Mr. Hodgson, appears perfectly identical in species with one from Southern India presented by Mr. Jerdon.

8. *Pr. lepida,* Nobis. A delicate little species, with the colouring of a *Malacocercus.* Length four inches and three-quarters, of which the

* At least, M. Delessert's description of the Neilgherry bird applies to specimens from the vicinity of Calcutta and from Tenasserim and Singapore; and M. Delessert, to whom I have shewn the latter, thinks them identical in species: but actual comparison is still necessary to confirm this.

middle tail-feathers are two and a half; wing an inch and three-quarters; bill to gape half an inch, and tarse five-eighths of an inch. Upper parts light brownish-grey, with central dark lines to the feathers; wing-coverts and tertials edged paler, the latter faintly rayed: tail distinctly rayed and tipped as usual: a whitish streak over the lores; and the whole under-parts slightly yellowish white: bill dark brown; legs pale. Indus territories. Sir A. Burnes.

9. *Pr. cysticola* (?); *Sylvia cysticola* (?), Tem.; *Cysticola schœnicola* (?, Bonap.) Lesson; *Prinia cursitans*, Franklin, *P. Z. S.* 1831, *p.* 118.* In Griffith's 'Animal Kingdom,' VI, 467, the *Sylvia cysticola*, Tem., is mentioned to inhabit "India (Gen. Hardwicke)," as well as Southern Europe: and previously to observing this statement, I had provisionally identified the present species with it. It varies a good deal in length of wing. Mr. Jerdon gives this as two inches, and such is the measurement of the wing of one specimen sent by Mr. Hodgson, while that of another from the same quarter barely exceeds an inch and three-quarters, and the wing of one sent by Mr. Jerdon is only an inch and five-eighths in length: these three have the crown longitudinally striated like the back; and Mr. Jerdon's bird is more fulvescent than the others, especially on the under-parts. In another from Mr. Hodgson the striation of the crown is less distinct, the wing measuring two inches; while in three others from the same naturalist the crown is almost uniform brown, and the rump of these is brighter fulvous; the wing of one measuring as much as two inches and a quarter, and of the other two inches. I incline to consider all identical in species;† but should Mr. Hodgson's prove distinct, he proposes the specific appellation *subhemalayana*.

In immediate contiguity to these *Priniæ*, ranges the genus *Orthotomus* (or Tailor-bird), whereof I believe there is but one Indian species, the adult of which was termed *O. Bennettii* by Sykes, while the young constitutes his *O. lingoo*: this bird, following Mr. Strickland, "should be called *O. longicauda*. I consider it," he adds, "to be the *Motacilla longicauda*, and *sutoria* (imperfectly described), of Gmelin;

* A figure of this species is given in the 1st No. of Mr. Jerdon's 'Illustrations of Indian Ornithology.'

† A contrary opinion is expressed in XI, 884, at the period of writing which, I had fewer specimens whereupon to found a conclusion.

Sylvia guzuratta, Lath.; *Orthotomus sphenurus*, Swainson; and *Sylvia ruficapilla*, Hutton," Elsewhere he remarks, of the Malayan species, "according to my observation, the *Edela ruficeps*, Lesson, (*Orthotomus edela*, Tem. *p. c.* 599, *f.* 2,) is the same as *Motacilla sepium*, Raffles, but is not the *Orthotomus sepium* of Horsfield.*

The true *Timaliæ*, with which the *Malacocerci* have been often arranged, are chiefly a Malayan group, and several presumed new species from Singapore have been described by me in *J. A. S.* XI, 793 *et seq.*† One common Malayan species, *T. pileata*, Horsf., extends into Assam, Nepal, and Bengal generally; and there is also one allied to *T. gularis*, Horsf., (which latter is common in Tenasserim,) the *T. chloris*, XI, 794, this being the type of Mr. Hodgson's *Mixornis*, and, as I suspect, the *Motacilla rubicapilla*, Tickell, *J. A. S.*, X, 576. I am aware of no other Indian species of true *Timalia*, unless *T. hyperythra*, Franklin, be retained in it; but the following group is considerably allied:—

Stachyris, Hodgson. Beak moderately slender, straight, compressed, and tapering sharp to the extremity, where the tip of the upper mandible has a very slight downward inclination, with little or no trace of a notch; nostrils almost closed by an impending scale; and rictus nearly smooth. Tarse of mean length and strength, the outer and inner front toes subequal; and claws moderate. Wings rounded, the 5th, 6th, and 7th primaries equal and longest: exterior three or four pairs of tail-feathers graduated. Crown subcrested, the feathers of this part semi-erect and more or less divergent.

1. *St. nigriceps*, Hodgson. Length five inches and a half, of wing two and a quarter, and tail two inches: bill to gape eleven-sixteenths of an inch; and tarse above three-quarters of an inch. Upper-parts

* *Ann. and Mag. Nat. Hist.* 1842, p. 371, and 1844, p. 35. Accordingly, the Indian Tailor-bird would rank as *O. longicauda*; that of Sumatra as *O. edela*; the Javanese species as *O. sepium*; and Mr. Swainson describes a fourth, from the S. W. coast of Australia, as *O. longirostris*. Mr. Strickland, who has recently examined the specimens upon which Col. Sykes and Dr. Horsfield founded their descriptions, writes me word; that "*Orthotomus lingoo*, Sykes, seems to be the young of his *O. Bennetti*; but I may be wrong," he adds: and he mentions that "*O. sepium* has the whole head and chin rufous, breast olive-brown, belly cream-colour, upper-parts olive:——not *Mot. sepium*, Raffles."

† One or more of these are probably identical with the Sumatran, *T. lugubris*, *T. mitrata*, or *T. striolata*, of M. M. Müller and Temminck, *Tydschrif voor natuurlyke geschiedenis*, &c. (44 to 1835,) the descriptions of which I have not seen.

olive-brown, the lower paler and rufescent; crown, throat, and face, dusky-black, the coronal feathers laterally margined with whitish-grey; chin somewhat albescent, and a white moustache from the base of the lower mandible: bill dusky-horn above, the lower mandible whitish; and legs pale. Nepal.

2. *St. pyrrhops*, Hodgson. Length about five inches, of wing two inches, and tail the same: bill to gape five-eighths of an inch; and tarse three-quarters of an inch. Upper-parts slightly greenish olivaceous, tinged with rufous on the head; below rufescent, more or less brown; lores and chin black, a pale line impending the latter: beak brown; and legs pale, probably greenish. The young differ only in the looser texture of their feathers. Nepal.

3. *St. chrysæa*, Hodgson. Length four inches and a quarter, of wing two inches, and tail an inch and seven-eighths: bill from gape nine-sixteenths of an inch, and tarse eleven-sixteenths. Upper-parts yellowish-olivaceous, the lower bright yellow; wings and tail dusky, margined with the colour of the back; forehead and crown yellow, the latter with black central streaks to the feathers; lores black; bill plumbeous; and legs pale yellowish. Nepal, Arracan.

4? The *Ægitalus flammiceps*, Burton, *P. Z. S.* 1835, p. 153, may perhaps belong to this group.

Erpornis, Hodgson. Combines the bill and crested crown of the preceding with the wings and tail of *Iora*.*

* Mr. Hodgson sends the following diagnostics of his genera *Stachyris*, *Erpornis*, and *Mixornis*.

"*Stachyris*, Mihi. *(Certhianæ? Leiotrichanæ? Parianæ?* [I do not hesitate to place it as above.—E. B.] Bill equal to head, very strong, pointed, and trenchant; tips equal and entire; its form conico-compressed and higher than broad, with culmen raised between prolonged nareal fossæ. Nares basal, lateral, with ovoid posteal aperture, the front being closed by the very salient rude scale above. Gape smooth. Frontlet rigid. Tongue cartilaginous, bifid, simple. Legs and feet very strong, suited to creeping and climbing in inverted strained positions. Tarse very stout, longer than any toe or nail. Toes short, unequal, depressed, basally connected, the hind stoutest and exceeding the inner fore. Nails very falcate and acute. Wings short, feeble, the first four primaries much graduated, the four next subequal. Tail medial, simple, firm.

"Type *St. nigriceps*. Sylvan, shy; creeps among foliage, buds and flowers, like *Zosterops* and *Orthotomus;* feeds on minute hard insects and their eggs and larvæ. Habitat, hills exclusively, central region chiefly. Sexes alike.

"*Erpornis*, Mihi (ερπω, to creep]. Close to the last form. Bill medial, conico-compressed, strong, straight, scarpt, pointed; the tip of the upper mandible rather

Erp. zantholeuca, Hodgson. Length about five inches, of wing two and a half, and tail an inch and seven-eighths: bill to gape five-eighths of an inch, and tarse the same. Entire upper-parts light olive-green, the lower dull white; coronal feathers elongated and spatulate: bill dusky yellowish-brown, and feet pale. Young having looser feathers, those of the crown not spatulate, and general colour of the upper-parts weaker and somewhat rufescent. Nepâl; common in Arracan, and occurs also in the Malay peninsula.

Iora, Horsfield. There are three distinct species of this genus, which have been erroneously considered identical; viz.

1. *I. zeylonica; Motacilla zeylonica*, Gmelin; *I. meliceps*, apud Horsfield, *J. A. S*, X, 50. Inhabits the Indian peninsula, and is at once distinguished by the jetty-black cap of the male, with more or less of this colour margining the dorsal plumage; tail also margined with yellowish-white, with often traces of green towards the extremities of the feathers.

2. *I. typhia; Motacilla typhia*, Lin. Inhabits Bengal, Nepal, Assam, and Arracan, being somewhat rare in the last-named province. Has no black except on the wings and tail of the male, though a dusky tinge is often perceptible on the crown and back of the male. One specimen only, of many dozens obtained in the vicinity of Calcutta during the height of the breeding season, has the hinder half of the crown

longer and notched. Nares elliptic, lateral, free, and placed in a membranous groove, with small process above the aperture. Tongue cartilaginous, simple. Wings medial, round, acuminate, firm, the fifth primary longest, first small. Tail subfurcate, simple. Legs and feet strong and repertatory, feebler than in *Stachyris*, but otherwise similar.

"Type, *Erp. zantholeuca*. Hab. central region. Sexes alike. Structure and habits passing from those of last towards those of *Zosterops*, by the notched bill, stronger wings, shorter feet, and furcate tail.

"*Mixornis*, Mihi (μιξις, compound]. Still near the last, but tending to *Iora*. Bill rather plus head, elongate, conic, but culmen and commissure inclining to arch: base subdepressed, gradually attenuated to blunt tip: upper mandible barely longer, or notched. Tomiæ scarpt, erect, entire. Nares ovoid, free, fossed, shaded behind by fossal membrane. Wings submedial, rounded, the fifth and sixth primaries subequal and longest; four first consecutively graduated. Tail medial, rounded, simple. Legs and feet suited to creeping and clinging. Tarsus smooth, strong, rather plus any toe. Toes short, unequal, depressed, basally connected: hind large, and in length equal to outer fore. Nails highly curved and acute.

"Type *M. chloris* [*Timalia* and *Iora chloris*, XI, 794; closely allied to *T. gularis*, Horsfield]. *Hab.* Lower hills. Sexes alike. Shy and exclusively arboreal. Essentially linked to the two last by its powerful bill and creeping feet, but leans towards *Iora* and Sylvian forms in the depression of the base of the bill."

black, with but a slight admixture of yellow, and appears as if it had been assuming the colouring of *I. zeylonica* by a change of hue in the feathers; but there is reason to suppose that this may have been a hybrid between the present and the preceding species. Mr. Jerdon, to whom I suggested their identity, upon the authority of the specimen in question, remarks, that "I think your first opinion of their distinctness will still hold good, at least the males have always some black here [in the South of India], though at one time I thought not," by which I presume he means some black upon the head. Certainly, I have tried much, in vain, to obtain a second specimen thus characterized. The females have the tail of the same colour as the back, more or less infuscated, and the dark portion of the wings merely dusky. I do not perceive that they can be distinguished with certainty from the females of the preceding species, though the darkened tail is a tolerable criterion, so far as I have observed.

3. *I. scapularis*, Horsfield. Inhabits the Malay countries. Colour considerably greener than in the others (as represented in Dr. Horsfield's figure), especially upon the head; and the white on the wings less developed. I have only seen females.

Another genus which appears to me to belong to the great *Timalia* group, is the *Cutia* of Mr. Hodgson, *J. A. S.*, V, 771, as was first suggested to me by Mr. Frith: and there is a difficult series of species with more Thrush-like or Warbler-like bills, but which are likewise referrible to the same subfamily, exemplified by the genera *Brachypteryx*, Horsfield, *Macronous*, Jardine and Selby, and *Malacopteron*, Eyton, all of which much require elucidation.

The genus *Brachypteryx* (*Lin. Trans.* XIII, 157,) was founded on two Javanese species, to the first of which it has since been restricted; and though several others have been referred to it by different authors, (as *Br. nigrocapitata*, Eyton, *P. Z. S.* 1839, p. 103,—*Br. atriceps*, Jerdon, and *Br. bicolor*, Lesson, *Rev. Zool.* &c. 1839, p. 138,) it would appear that all of these, with the *Br. sepiaria* of Dr. Horsfield, exhibit more of the characters of *Malacopteron*, Eyton, (*P. Z. S.* 1839, p. 102), with which Mr. Strickland identifies my *Trichastoma* (*J. A. S.*, XI, 795). To the same group must likewise be assigned the *Timalia poiocephala* of Jerdon's Supplement. In the first edition of Mr. G. R. Gray's 'List of the Genera of Birds,' the name *Brachypteryx* is

stated to have been pre-employed in Entomology, and *Goldana* is substituted for it; but in the second edition of that work, the former appellation is restored to Ornithology.

The very curious species upon which the genus *Macronous* was founded, has more the character of the true *Timaliæ* than any of those which follow, and has been described in *J. A. S.* XI, 795.

Next to it, I had arranged a bird which has recently been described by Mr. Strickland by the name *Malacopteron macrodactylum* (*Ann. and Mag. Nat. Hist.* 1844, p. 417), but I still consider it to merit separation, from the general robustness of its conformation, and the great strength of the tarse and of the middle and hind toes. The bill closely resembles that of *Macronous*. I designate it

Turdinus, Nobis. Form somewhat Meruline, thick-set, with large strong legs and toes, and rounded wings and tail. Bill as long as the head, moderately stout, straight, compressed, the ridge of the upper mandible angulated, its tip emarginated, and curving over that of the lower mandible; nostrils oval, and pierced in the fore-part of the nasal membrane, at some distance from the frontal feathers; rictus well armed: legs stout, the tarse equalling the middle toe with its claw; outer and inner toes equal, and proportionally small, their terminal joint reaching only to the penultimate joint of the middle toe; hind toe strong, and furnished with a rather large claw, but moderately curved: wings much graduated, the fifth to the ninth primaries inclusive subequal and longest, the first about half their length; tail also graduated externally, and hollowed underneath; plumage lax and scale-like, at least on the upper-parts, very copious and puffy over the rump.

T. macrodactylus, (Strickland) Blyth. Length about seven inches (making allowance for the manner in which the skins which I have seen have been prepared), of wing three and a half, and tail two and a half; bill to gape an inch; tarse an inch and one-eighth; hind-toe and claw seven-eighths. Colour a rich brown above, generally darker on the crown, the centres of the feathers paler, and their margins black; rump inclining to rusty, and devoid of marking: wings and tail also plain rusty-brown, darkening on the latter: throat white, with the shaft of each feather blackish, terminating in a slight spot more developed towards the breast; rest of the under-parts confusedly mottled,

the abdominal feathers dull white, laterally marked with greyish, the breast and flanks nearly resembling the back, and the under tail-coverts rusty-brown: bill dark horn-colour, and legs and toes brown, the claws pale. Brought from Singapore.

Malacopteron, Eyton, *P. Z. S.* 1839, p. 103, founded on two species, *M. magnum* and *M. cinereum*, Eyton, to which, according to Mr. Strickland (*An. and Mag. Nat. Hist.* 1844, p. 35), my *Trichastoma rostratum* and *Tr. affine*, *J. A. S.* XI, 795, must be referred; an identification which I suspect holds true in neither instance, further than as regards the genus. With the series of species before me, I find it necessary to restrict the group *Malacopteron* to those species which, as stated by Mr. Eyton, have the bill about equal to the head in length.

1. *M. magnum*. Eyton. Described to have the forehead and tail ferruginous, the neck black, the back, and a streak across the breast, cinereous; wings brown, and bill yellow. Length six inches; of bill seven-twelfths of an inch, and tarse nine-twelfths. Female smaller, with the head and neck ferruginous, spotted or mottled with black. Inhabits the Malay peninsula.

2. *M. ferruginosum*, Nobis. Bill somewhat thicker and more Fly-catcher-like than in the others, and the wings comparatively longer. Length about seven inches, of wing three and a quarter, and tail two and three-quarters: bill to gape an inch; tarse an inch and one-sixteenth; hind-toe and claw three-quarters of an inch, the latter very large, being double the size of the middle front claw. Colour of the upper-parts ferruginous-brown, purer dull ferruginous on the crown and wings, and much brighter ferruginous on the tail; coronal feathers of different texture from the rest, being somewhat broad, with disunited webs, inconspicuously squamate: under-parts much paler, the throat and belly white; lores albescent, contrasting with the rufous hue of the crown. Bill dusky-brownish above, pale and yellowish below; and legs light brown. Probably from Singapore.

3. *M. rostratum*; *Trichastoma rostratum*, Nobis, *passim*. I have nothing to add to the description before given of this species, to which that by Mr. Eyton of *M. magnum* does not apply. Its form is less robust than that of the preceding species.

Alcippe, Nobis. Has the bill much shorter than the head, approaching nearly in form to that of *Leiothrix:* in other respects resembling the foregoing; but the toes generally are small and proportionate.

1. *A. cinerea?* (Eyton). A species which, from the name, I suspect must be this, differs from the next in its predominating more ashy tinge, having the crown, neck, and back, uniform dusky greyish-brown, the wings and rump tinged with fulvous, tail darker and inclining to dingy maronne, but still fulvescent in some lights, and the under-parts whitish, tinged on the throat and breast with ashy; bill light horn-colour, and feet pale. Length about five inches and a half, of wing two and five-eighths, and tail two and a quarter; bill to gape eleven-sixteenths of an inch, and tarse three-quarters of an inch. The tail, also, is less rounded, and the tips of its feathers are less wedge-shaped, than in the next species. Received from Singapore.

2. *A. affinis; Trichastoma affine*, Nobis, *passim*. Distinguished from the preceding by its darker crown, paler nape, the more rufescent hue of the back and rump, and deep ferruginous tail-feathers; the under-parts are whiter, with a distinct brownish-grey band crossing the breast. This species could scarcely have been designated *cinerea*, which name is appropriate in the instance of the preceding one.

3. *A. poiocephala; Timalia poiocephala*, Jerdon, *Supplement to Catalogue*. This considerably approaches *Siva nipalensis*, Hodgson, of the *Leiotrichane* series; and has the rictal bristles less elongated, and the feet stouter, with a more robust hind-toe, than in the foregoing. The colour is olive, passing to dark russet on the rump, tail, and wings; the crown ashy; and under-parts pale rufescent. Inhabits Southern India.

4. *A. atriceps; Brachypteryx atriceps*, Jerdon. Rictal bristles still shorter; the crown and ear-coverts black; the rest of the upper-parts fulvescent-brown, and under-parts white, passing into brownish on the flanks. Legs apparently have been lead-coloured. Inhabits Southern India.

The two next would seem to approach the second species, but cannot well be identified with it, nor with each other. The length of both is given as five inches only.

5. *A.* (?) *sepiaria; Brachypteryx sepiaria*, Horsfield. "Olivaceo subfulvescens, subtús dilutior, gula abdomineque medio albidis. Remiges

et rectrices badio-fuscæ, externæ fere badiæ; rectrices duæ mediæ concolores. Crissum badio testaceum." Hab. Java.

6. *A. (?) bicolor; Brachypteryx bicolor*, Lesson, *Rev. Zool. de la Soc. Cuv.*, 1838, p. 138. "Corpore supra, sincipite, genis caudaque brunneo-spadiceis; gula, collo, thorace, abdomineque albo sericeo; tibiarum plumis castaneis. Rostro livido; pedibus *subincarnatis*." Hab. Sumatra.

The *Brachypteryx nigrocapitata*, Eyton, is rather a peculiar species, intermediate in development of bill to *Malacopteron* and *Alcippe*, but having the lengthened rictal vibrissæ characteristic of those divisions little more than rudimentary. It is described in *J. A. S.*, XI, 796.

Setaria, Nobis. Very close to *Alcippe*, but cannot exactly be arranged therein. Bill shorter than the head, moderately stout, somewhat depressed at base, a little compressed beyond the nostrils, the upper mandible slightly emarginated, its ridge angulated throughout, and the tips of both distinctly accurved: rictus armed with large setæ, which are particularly strong and firm towards their base, offering much resistance; the frontal feathers also are erect and rigid to the feel, and especially those which surmount the loral region. Wings of mean length, having the fifth and sixth primaries longest: tail also of mean length, a little graduated externally. Feet moderately stout, the outermost toe exceeding the inner one in length, the hind toe and claw large and strong, equalling in length the middle toe with its claw, and all the claws moderately curved. Plumage lax, but squamate upon the crown, copious and puffy over the rump.

S. albogularis, Nobis. Length about five inches and a quarter, of wing two and three-quarters, and tail two and a quarter; bill to forehead half an inch, to gape eleven-sixteenths of an inch; tarse three-quarters of an inch; hind toe and claw above five-eighths of an inch. Upper-parts olive brown, tinged with rufous on the rump; head, including ear-coverts, dark ash-colour, with a white streak over but not beyond the eye, and meeting its opposite above the base of the bill; lores black; throat white; an ash-coloured band across the breast; flanks and under tail-coverts rufescent, and belly white slightly tinged with the same: bill black above, beneath whitish; and feet have probably been greenish. Received from Singapore.

The following very distinct form among the Flycatchers is also believed to be from the same quarter.

Iole, Nobis, *n. g.* Allied to *Muscipeta*, and especially to my *M. plumosa* (*J. A. S.* XI, 791), but the beak much less widened, being nearly similar to that of *Trichastoma ferruginosum* (hereinbefore described.) Bill of moderate length and strength, undepressed, and scarcely compressed, narrowing evenly to the tip, the ridge of the upper mandible angulated throughout, and its tip slightly overhanging that of the lower mandible, and distinctly emarginated; nostrils fissured in the lower part of the nasal membrane; gape well armed. Feet as in *Muscipeta*, but rather stouter, the outer front toe and claw barely exceeding in length the innermost. Wings of mean length, graduated, the fourth, fifth, and sixth primaries subequal and longest, and the seventh exceeding the third: tail slightly rounded. Plumage soft, and excessively dense and copious over the rump; the crown (at least in the species described,) subcrested, with pointed feathers much as in *Hypsipetes*.

I. olivacea, Nobis. Length about six inches and three-quarters, of wing three and a quarter, and tail three inches; bill to gape seven-eighths of an inch; tarse five-eighths of an inch; hind-toe and claw seven-sixteenths. Colour of the upper-parts deep olive-brown, with a slight greenish tinge, which latter is wanting on the tail, and is scarcely visible on the subcrested head: under-parts much paler, passing into dull yellowish-white on the belly, and darker on the sides of the breast. Bill dark corneous above, the lower mandible pale; and feet light brown.

Muscicapa leucogastra, Nobis. Length about six inches, of wing three, and tail two and a quarter; bill to frontal feathers half an inch, and tarse nearly five-eighths. Head, throat, front and sides of the neck, ear-coverts, and breast, glossy-black; nape, scapularies, interscapularies, wings and tail, dusky greyish-brown; the rump purer grey; and belly and under tail-coverts white, slightly tinged with fulvous. Bill black; and legs, in the dry specimen, dusky. Probably Malayan, but perhaps Chinese.

M. rubecula, Nobis.* Length six inches and a half, or more, of wing three and five-eighths, and tail three and one-eighth; bill to frontal feathers above half an inch, and tarse five-eighths of an inch. Head, including ear-coverts, glossy dull black; scapularies

* The *M. rubecula*, Sw., is a female *Cyornis*, vide p. 390.

and interscapularies ashy-brown; the rump dark grey; wings and tail dusky-brown, the outermost feather of the latter slightly albescent: throat, fore-neck, and breast, bright ferruginous; the belly and under tail-coverts fulvescent-white. Bill dark horn-colour, and legs appear to have been leaden-brown.

A supposed young female is smaller, having the wing but three inches, and tail two and three quarters. The nestling garb appears to be retained about the nape, where the feathers are of open texture, and of a light brown colour. Crown and ear-coverts dark ashy; and the colours generally are less deep, the breast being of a much weaker ferruginous, still more diluted on the throat. Bill imperfect, and what remains of it induces me rather to doubt the specifical identity of this with the preceding specimen. Both, with *M. leucogastra*, have the bill remarkably broad at base, and approximating the *Muscipetæ*.

Vanellus leucurus (?); Charadrius leucurus (?), Lichtenstein, mentioned in Griffith's work to inhabit Tartary, as well as Egypt and Nubia. I have obtained a single specimen in the Calcutta bazar of a species which I doubt not is the Tartarian bird here alluded to,* but whether perfectly identical with the African species is more doubtful. As compared with the figure in the great French work on Egypt, this Asiatic specimen differs in having no trace of the rufous-isabelline tint represented, beyond a mere blush of this hue on the abdominal region, and there is no defined grey patch on the breast. Length (of a female) eleven inches, by twenty-three inches in alar expanse; wing seven inches; tail two and three-quarters; bill to forehead an inch and one-eighth; tarse two inches and five-eighths. Irides reddish-amber; bill black, and legs and toes bright yellow, the claws black. General colour brownish-grey, with a reddish-purple gloss on the mantle, extending over the tertiaries; head and neck browner and glossless, the throat and around the bill white; breast more ashy, the feathers margined paler; rest of the under-parts, with the tail and its upper coverts, white, the belly and flanks conspicuously tinged with dull rosy, or a roseate-cream hue; primaries and their coverts black, the secondaries and their coverts largely tipped

* Here may be mentioned that I have likewise procured a beautiful fresh specimen of the *Anas formosa*, Gmelin, shot on the salt-water lake near Calcutta, which species is described to frequent Lake Baikal, and was unknown to Mr. Hodgson who had never met with it in Nepal. The tracheal bony vesicle is but slightly developed.

with white, and having a black bar above the white; rest of the wing-coverts like the back.

The general colour of this species approaches that of the *Lobivanellus cinereus*, Nobis (XI, 587), which latter is perhaps the *Vanellus keptuschka*, Tem., of a catalogue of Bengal birds published in the *An. and Mag. Nat. Hist.* 1843, p. 447, as it sufficiently agrees with the brief description of *Charadrius keptuschka*, Lepech., in Griffith's work, where, as synonyms, are attached the *Tringa fasciata*, Gmelin, as the female, and *Ch. gregarius*, Pallas, as the young. The same synonyms are, however, annexed in a paper by Prof Brandt, 'On certain Siberian birds described by Latham,' published in the *An. and Mag. Nat. Hist.* 1843, p. 114, where it is added that the 'Black-sided Sandpiper' of Hardwicke's published drawings "seems to belong to this species," being, on the other hand, very different from my *cinereus*. Cawnpore is mentioned on Hardwicke's plate as the locality where his two specimens were obtained, and Mr. Frith tells me, that he also has met with the same species in Bengal; but it has not hitherto occurred to me, nor to Mr. Jerdon in the South of India. In the same list of Bengal specimens, *Vanellus cristatus* is also mentioned, a species which is common along the Indus, and is included in Mr. Hodgson's MS. catalogue of Nepalese birds; but this also I have not yet met with here, neither have I hitherto obtained the *Hoplopterus ventralis* in this vicinity; but I have procured two examples only of *Sarciophorus bilobus**: *Lobivanellus goensis* is very common, and *L. cinereus* far from rare. For an arrangement of this Lapwing group, vide *P. Z. S.* 1841, p. 42.

Totanus brevipes, Vieillot (apud Drapiez, *Dict. Class. d'Hist. Nat.* III, 572. "Patrie inconnue"). The Society possess an old specimen of a Sandpiper which I think may be referred to this, though rather superior in dimensions to those assigned in the work cited. It is not very unlike the Green Sandpiper (*T. ochropus*), but is larger, with no white over or upon the tail, and remarkably short legs. Length about nine inches and a half; of wing six inches, and tail two and a half; bill to forehead an inch and a half; and tarse under an inch and a quarter. Colour of the upper-parts uniform dingy olive-

* Recently, (in September and October 1844,) several fresh examples of this species have occurred.

brown, the small wing-feathers having a subterminal faint dusky bar, and slightly tipped with albescent; primaries dusky-brown: throat, fore-neck, and breast, paler than the upper-parts; the belly and under tail-coverts white: a whitish line also from the beak to the eye above it, and a darker one bordering it below on the lores. This specimen (with the two *Muscicapæ* just described,) formed part of a collection made at Macao, but comprising many Malayan species; and it is probably Chinese. Eight inches (French) is stated to be the length of M. Vieillot's species; but I have little doubt that the present specimen is correctly referred to it.

T. solitarius, Vieillot, apud *Dict. Class.* This is another little-known Sandpiper, from the western coast of South America, intermediate to *T. glottis* and *T. fuscus*. Length about fourteen inches, of wing seven and a half, and tail three inches; bill slender, and two inches and three-eighths to forehead, its tips much accurved; tarse two inches and three-quarters. Upper-parts olive grey, the feathers laterally margined with dusky-black and whitish alternately, forming the extremities of transverse bars which are obsolete in the medial portion of the feather; crown dark, the feathers laterally margined with whitish; neck streaky, the dark colour predominating behind, and the white in front; above the lores, the throat, and the under-parts from the breast, pure white, having some dark streaks and broken bars on the pectoral feathers; primaries dusky; the upper tail-coverts chiefly white; and tail closely barred white and dusky, the colours of its middle feathers blending except on their lateral margins. Bill dark; and the legs appear to have been greenish. Inhabits Chili.

P. S.—It is so long since the foregoing Report, and the former portion of its Appendix, were published, that I have now a few further elucidations to offer on some of the groups treated of.

Vol. XII, p. 930. For *Erythrospiza rosea*, read *E. erythrina*, vide Strickland in *An. and Mag. Nat. Hist.*, 1844, p. 38. It is a typically formed species.

P. 933. *Corvus rufus*, Lath., is identical with *Crypsirina vagabunda*. *Temnurus leucopterus* seems to be allied to the Drongos, and like them would appear to have only ten tail-feathers.

P. P. 941, 1007. Genus *Cyornis*, Nobis. Add, as a fifth species, *Muscicapa pallipes*, Jerdon; and probably as a sixth, *M. indigo*,

Horsfield. The *M. rubecula*, Swainson, would appear rather to be the female of *C. Tickelliæ*, Nobis, than of *C. banyumas*, in which case the name *rubecula* must stand for the former.

P. 944. *Chrysococcyx lucidus* has now been also received from Arracan: and I have just seen a fine adult from the hilly district of Monghyr, in Bengal.

P. 945. *Centropus dimidiatus*, Nobis. Lately received from Cuttack, and may yet probably turn out to be the final plumage of *C. lepidus*.

Phœnicophaus lucidus, Vigors, "described in Lady Raffles' Memoir, p. 671," is identical, as I am informed by Dr. Horsfield, with the species No. 18 of my Monograph of eastern *Cuculidæ*, XI, 923, and XII, 246.*

* Mr. Strickland has favored me by examining certain specimens of *Cuculidæ* in London, and otherwise aided in reducing the synonyms of the group. "The *Cuculus flaviventris*, Scop., v. *radiatus*, Gm." (vide XI, 900), he informs me, "is a good species. I have a specimen from Malacca, exactly agreeing with Sonnerat's description, except that the tail is not even, but very slightly rounded, with the outermost pair of feathers an inch and a quarter shorter than the rest. It is of the size of *C. fugax*, the beak rather more slender." (Can it be the *C. tenuirostris*, Lesson, referred by me to *C. fugax*, vide XII, 943? In such case, it would doubtless have been confounded with *C. fugax*.) Of the Javanese specimen referred to *C. canorus* by Dr. Horsfield (vide XI, 902), Mr. Strickland writes—"Apparently the same as the European, but I had not a European one to compare with it at the time. It is not the *micropterus*, nor the *fugax*, both of which are at the India House.—*C. pravata*, Horsfield,=*C. Sonneratii*, Lath.,=*C. rufovittatus*, Drapiez" (XI, 906, 911). "I have seen many specimens from Malacca, all in the same plumage, but I never saw any *adult-looking* bird to which it could be referred. It has a broader beak than any other Cuckoo of the same size.—*Cuc. lugubris* is, I suspect, the same as *dicruroides*. I have a forked-tailed one with the wing four inches and three-quarters long, and an even-tailed one from Malacca with the wings five inches and a quarter, being the reverse of the supposed distinctions between them." To this (vide also XII, 244), I may remark, that several Malayan specimens which I have seen have all been smaller than the Indian ones; and the same relation holds between the Malayan *C. flavus* (of which *C. pyrogaster*, Vieillot, *J. A. S.* XI, 912, is probably a synonym,) and the Indian bird which I referred to *C. niger* (XI, 908, XII, 940 *et seq.*, 944), but which I now think cannot be the *C. niger*, Lath., founded on the "Black Indian Cuckoo" of Edwards, which, if his figure and description can be depended upon, would seem to be a small species of Coël (*Eudynamys*); though in that case I should doubt its occurrence in Bengal. Of *Eudynamys*, too, I must remark that the Australian Coël, referred to *Eu. orientalis* by Messrs. Vigors and Horsfield (vide XI, 913), is considered distinct by Mr. Swainson, who styles it *Eu. australis* ('Menag.', p. 344), and

P. 948. Genus *Garrulax*. *G. rufifrons*, No. 3. There is also a *Crateropus rufifrons*, Sw. ('Menag.',) which is probably identical with M. Lesson's species.

No. 11, *G. melanotis*. Capt. Phayre sent two specimens with black ear-coverts, such as I have never seen among numerous examples of *G. pectoralis* from the Himalaya; but a third, forwarded subsequently, has an admixture of white on the ear-coverts, though less than in the Himalayan specimens: and hence I now think that the Arracan bird had better be regarded as a variety only of *G. pectoralis*.

Nos. 13, *G. lunaris*, and 14, *G. ruficollis*, are identical, and will retain the latter appellation. The Society has received fine specimens from Tipperah.

No. 29, *G. Delesserti*, is nearly allied to *G. gularis*, No. 8.

Nos. 25, *G. lineatus*, and 26, *G. setafer*, are also, I greatly suspect, identical, in which case the former name must be preserved.

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assigns to it considerably larger dimensions. Lastly, I have to observe that the alleged Chusan specimens referred to *Cuc. flavus* in XII, 944 (note), and the *Chrysococcyx chalcites* of the same page, and *Centropus dimidiatus* of p. 945 (note), were obtained, as I have now much reason to suspect, from the vicinity of Singapore, although the former localities were given to me with much positiveness; certainly the specimens were prepared as the Singapore bird-skins usually are, and one in the same lot which was stated to be South American, proves to be the Malayan *Turdus modestus*, Eyton, which Capt. Phayre has since procured in Arracan. But to return to Mr. Strickland's notes: the Malayan *C. flavus*, he remarks, "should more properly stand as *C. merulinus*, Scopoli; and the Australian *C. cineraceus*" (XII, 242) "is very distinct from *merulinus*, being much larger and longer in the wing," &c. For the Indian bird he retains the name *tenuirostris*, Gray. "*Cuculus basalis*, Horsf., is identical with immature specimens of *Chrysococcyx lucidus*, from Australia. *Phœnicophaus melanognathus*, Horsf., has the nostrils narrow, and the lower mandible black:—not *Cuc. melanagnathus* of Raffles, your *Ph. viridis*" (XI, 927), "which has round nostrils, and a red spot on the lower mandible. The *Cuculus sumatranus*, Raffles, is also distinct from *Ph. Diardi*," (No. 24 of my monograph, XI, 928, vide XII, 246,) "having the belly and lower tail-coverts rufous, and the nostrils narrow, almost linear, and oblique. I have it from Malacca. *Centropus lepidus*" (XI, 1102, XII, 945 note) "is larger (not less, as Horsfield states,) than C. *affinis*, and has the beak stronger and higher. *C. affinis* is the smallest of all the species, the wing measuring but five inches and three-eighths, and tail six and a half. It is certainly the *Cuculus viridis*, Scopoli, founded on Sonnerat's *Voy. Nouv. Guin.*, pl. 80. The curve of the hind claws in Horsfield's specimen is only very slight." May not this be *C. bengalensis*, v. *pumilus*, XI, 1104, XII, 945?

No. 29, *G. Delesserti*, is nearly allied to *G. gularis*, No. 8.

The *Turdus ochrocephalus*, Gm., Horsfield, *Lin. Trans.* XIII, 149, is now doubtfully referred by Dr. Horsfield to this group.

Nos. 1, *G. leucolophos*, and 20, *G. rufogularis*, occur in Sylhet; and the former also in Arracan.

P. P. 953 and 958. The genus *Ixops*, as Dr. Horsfield informs me, is identical with *Actinodura*, Gould; and *Sibia* must be retained for *S. picoides* and *S. gracilis*, while *S. nigriceps* should perhaps be separated, and is allied to *Yuhina*, Hodgson, *As. Res.* XIX, 165.

Leiocincla plumosa is also an inhabitant of Sylhet; and the *Turdus canorus*, Lin., mentioned in the note, I have now referred to the common *Malacocercus* of Bengal, vide note to p. 368.

P. P. 955, *et seq.* The name *Phyllornis* has the priority over *Chloropsis*, and must therefore be adopted. The specimen which I described as the female *Ph. cœsmarhynchus* proves to be a male of the species referred to *Ph. cochinchinensis* by Mr. Jerdon: but it is doubtful whether the latter be the true *cochinchinensis*, Auct., which is described as being "towards the tail and outer edges of the wings blue." Now Mr. Jerdon's species has no trace of blue either on the tail or wings, except the usual verditer patch on the shoulders of the wings, and a tinge of the same on the lesser coverts of old birds, the outer primaries having their external webs more or less yellowish, especially in the females and young. Should it prove distinct, I would propose for it the appellation *Ph. Jerdoni*. The black portion of the throat of this bird is surrounded by dull pale yellow, which is continued up over the forehead.

From Arracan, the Society has received three species of this genus, viz. the Himalayan *Ph. Hardwickii* (v. *curvirostris*, *&c.*), which is there rare, and the other two common,—*Ph. aurifrons*, and a species which resembles the so-called *Ph. malabaricus* in size and colouring, but has the bill more tapering and pointed, as in those of India. I do not like, however, to venture on separating it from *Ph. malabaricus*. It may be added, that *Chloropsis mysticalis*, Sw., refers to the female of the Malayan *malabaricus*; and *Turdus viridis*, Horsf., (according to Mr. Strickland,) is the female *Ph. Sonneratii*, v. *Meliphaga javensis* of Dr. Horsfield's catalogue.

P. 960. *Pitta malaccensis* has, I believe, been already so denomi-

nated by Scopoli.* *P. nigricollis*, Nobis (of which I suspect *P. rodogaster* to be merely the young), is the *P. cucullata*, Hartlaub, described in the *Rev. Zool.*, 1843, p. 65, and recently by Mr. Strickland in the *An. and Mag. Nat. Hist.* 1844, p. 410. Mr. Strickland retains the name *Pitta* for this genus, rejecting *Brachyurus*, Thunberg, which Mr. G. R. Gray proposes should be substituted.

P. 963. Genus *Phylloscopus*. All the species described, with the exception of *Ph. magnirostris*, (which I have now reason to suspect is the *Sylvia javanica*, Horsfield), and two or three others in addition to them, have now been obtained by Mr. Jerdon in Southern India. *Ph. tristis*, Nobis, was referred to *Sylvia trochilus* in that gentleman's first catalogue.

P. 968. *Culicipeta Burkii*. Add *Cryptolopha auricapilla*, Swainson ('Menag.', p. 343), as another synonym.

P. 983. *Diceum Tickelliæ*, Nobis, is the *Certhia erythrorhynchus*, Latham; the young bird having a fleshy-red bill, which colour is much exaggerated in one of Buchanan Hamilton's drawings, a duplicate of which was probably Latham's authority for the species. The specific name *erythrorhynchus* is, however, so inappropriate that it can scarcely be retained

P. 985. Magpies. I was wrong in identifying the Chilian species with that of Europe, which latter has since been received by the Society. The other is intermediate in its proportions to *P. bottanensis* and *P. caudata*, and may be termed

P. media, Nobis. Exactly similar to the British Magpie, but larger, with proportionally stouter legs, and tail scarcely so long. Length of wing eight inches and a quarter, that of the Bootan species measuring nine and three-quarters, and of the European Magpie but seven inches. Middle tail-feathers ten inches; bill to gape one and seven-eighths; and tarse two inches and one-eighth. Inhabits the Andes. The tertiaries and borders of the secondaries are of a finer steel-purple than in the European species, and the gloss of the tail is greener, with less of a bronze cast. The tail of the Yellow-billed Magpie of Western North America has again a different gloss; and I remember seeing a species smaller than that of Britain among

* Vide, however, a Note by Mr. Strickland in the 'Annals and Magazine of Natural History' for July 1844, p. 47.

the stores of the Zoological Society, which had a black bill, but the tail was glossed as in the yellow-billed species.

P. 990. *Buceros pucoran* should be *B. pusaran*, Raffles. Specimens of both it and *B. plicatus* have lately been received from Arracan, and the former proving to have a yellow gular skin, may now be considered as sufficiently determined.

P. 998. *B. gingalensis*, Shaw. This I have since examined, and it seems, with some others, (as the African *B. limbatus* and *B. flavirostris* of Ruppell,) to constitute a particular group of Hornbills, which may some day rank as a subgenus.

"*Halcyon smyrnensis*, var.? *albogularis*," is identified by Mr. Strickland with *H. gularis*, (Kuhl); *H. ruficollis*, Sw.; and *H. melanoptera*, Tem.: a species which was procured in the Philippine Islands by Mr. Cuming.

P. 1000. *Picus (Gecinus) viridanus*, Nobis. The female has the crown and *pileus* wholly black, the ear-coverts and sides of the neck are darker than in the male, and the entire plumage is more dingy, with the marking of the under-parts less defined.

P. 1005. *Picus* (*Chrysocolaptes*) *melanotus* is the *Dendrocopus Ellioti* of Mr. Jerdon's catalogue, and perhaps also identical with *P. strenuus*, Gould, obtained by Dr. McClelland in Assam. For the present it will range as *Chrysocolaptes Ellioti*. The female differs in having the frontal feathers to above the eye broadly tipped with whitish, and the crest glistening bright yellow, with a tinge of red at its extremity.

P. 1008. The two Barbets mentioned are the *Bucco viridis*, Gm., and *B. zeylanicus*, Auct, v. *caniceps*, Franklin, v. *lineatus*, Tickell.

P. 1010. The *Fringilla agilis*, Tickell, *Pipra squalida*, Burton, and *Parisoma vireoides*, Jerdon, prove to be the same species, which must be distinct from *Pardalotus pipra* of Lesson, to judge from the generic characters which he assigns to the latter, upon which is founded his genus *Idopleura*, *Rev. Zool.* &c. 1838, p. 44.* The present species I distinguish as follows:—

Piprisoma, Nobis, *n. g.* Bill short and subconical, acutely triangular as viewed from above, the ridge of the upper mandible angulated,

* There is a *Pardalotus maculatus*, Tem, *p. c.* 600, from Sumatra and Borneo, which may perhaps be referable to either *Idopleura* or *Piprisoma*.

and that of the lower slightly but distinctly so; the outlines of both accurved, of the lower somewhat more abruptly (being tumid at base towards the divarication of its two lateral rami), and the tip of the upper overhangs that of the lower mandible, but without showing any marked terminal bend; nostrils almost closed by the nasal membrane; gape unarmed. Feet formed for perching, and rather small than otherwise, the tarse equalling the middle toe with its claw, the outer and middle toes connected to the first joint, and the claws compressed and moderately hooked, as in the more typical perchers. Wings reaching to the end of the tail, which is rather short; and having the first primary exceedingly minute, and the four next equal and longest: tail even. Plumage sombre and unadorned.

P. agilis, (Tickell,) Nobis. Length four inches,* of wing two and a quarter, and tail one and one-eighth; bill to gape three-eighths of an inch, and tarse half an inch. Colour dull ashen-olive, tinged with green upon the rump and upper tail-coverts, and margining the greater wing-feathers; beneath whitish, having a few ashy-brown striæ on the breast, and one along each side of the throat: tail darker towards the end, and slightly edged at tip with whitish, which forms a terminal spot upon the inner web of its outermost feathers: bill mingled whitish and dusky-corneous; and feet lead-coloured. Inhabits the Himalaya, and central and Southern India.

Vol. XIII, p. 363. *Sturnia*, No. 3, has just been figured by Mr. Jerdon with the specific name *Blythii*. *Calornis cantor*.

P. 366. *Calornis cantor*, &c. The *Turdus strigatus*, Horsfield, is founded on the second state of plumage referred to; so that this species is both *T. chalybeus* and *T. strigatus*, Horsfield. *Strickland.*

P. 373. *Sphenura striata.* I have just obtained the nest and eggs of this species, the latter blue as in the *Malacocerci*, and the vest also nearly accords with that of a *Malacocercus*.

P. 376. *Prinia Franklinii.* Add, as a synonym, *Sylvia longicaudata*, Tickell, J. A. S. II, 576.

* The preserved skin sent on loan by Mr. Jerdon, measures but three inches and a half, which is the length given by Burton.

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A Grammar of the Cashmeeree Language. By Major R. Leech, C. B. *1st Assistant Governor General's Agent, N. W. F.*

The following few pages, drawn up with the assistance of an educated Mussulman of Loodiana, who has not re-visited his country for a quarter of century, are intended to facilitate the acquisition of a colloquial knowledge of the Cashmeeree language, and although they do not deserve the name of a Grammar so much as the publication by Dr. W. Carey in 1812, entitled a Grammar of the Punjabee Language, yet the student will not have to get by heart such laboriously manufactured tenses of verbs as that at page 85, of the above work.

Ex.—" Let him be obliged to be caused to be made." Much labor and time would be saved, and every ordinary purpose answered, if in order to assist the acquirement of a colloquial knowledge of similar minor dialects, that scarcely deserve the name of a language, a Vocabulary only of words, and a collection of sentences actually heard spoken, were made in the Roman character.

The Cashmeeree language (Kaushir Zeo,) is not generally a written one; the character called Sháradá, (after the Goddess of that name,) having been, and being chiefly used to write Sanscrit works. The language is without doubt of Sanscrit origin, but has been considerably corrupted by the number of Persian words grafted on it by the Mahommedan conquerors of the province. It differs slightly in almost every pergunna. For instance, a cry in the city is called *kreak;* at Islamabad *krik;* and in other parts *krek.* A hill in the city is called *labur,* and *lábur* in the districts. In the city the bill of a bird is called *toent,* and in the suburbs *tsoents;* also a snake is in the former called *sareep,* and in the latter *sriph.* The dialect spoken at Kishtewar is, as might be expected, a mixture of Cashmeeree and Punjabee.

From the number of vowels and diphthongs, the language it would appear cannot be written correctly, either in the Devanagaree or Arabic character.

A Cashmeeree in speaking Persian, munches it, as it were with, and hisses it through, his teeth.

The *ou* (of our), of the Persian *houz,* (a cistern,) and the Hindustanee *koudee,* (a shell,) is changed in the mouth of a Cashmeeree into *oa* (of oar) and they pronounce them *hoaz* and *koadee.* They also change *Kábul* (the *a* of car) into *koabul.*

They moreover change the Persian and Hindustanee *ai,* (of aisle,) of *paisa,* (a copper coin,) which is pronounced as *á i* into *a i* or *aai,* and they drawl out *paainsa.* In fact, the language is typical of the depressed and sneaking nation.

Natives of Cashmeer, who have acquired a knowledge of the more free and elegant Persian, are almost ashamed of their own puerile native tongue, which quality is imparted to it chiefly I suspect from the frequent occurrence of the consonant *ts* (of 'prints,') known both to the Pushtoo and Mahratthee, and the various dipthong of *i.*

Sanscrit.	*Gurmukhee.*	*Sháradá.*	*Name.*	*With Consonant.*	*Name.*	*Value of a Letter.*
अ	ਅ	𑆃	ओदोअ	क	ádou a, ...	a last a of America.
आ	ਆ	𑆄	ऐतोआ	का	aitou á, ...	á in part.
इ	ਇ	𑆅	यियोये	कि	yayou ye,...	i in hit.
ई	ਈ	𑆆	इशरोई	की	isharou ee,.	ee in feel.
उ	ਉ	𑆇	उपल्वो	कु	upal wo, ..	u in full.
ऊ	ਊ	𑆈	उपल्बाउ	कू	upalbá woo,	oo in fool.
ऋ		𑆉	रिनोवे		rinou re, ...	Peculiar to Sanscrit.
ॠ		𑆊	रखोरू		rakhou roo,	
ऌ		𑆋	लियोले		liyou le, ..	
ॡ		𑆌	लिसोली		lisou lee, ...	
ए	ਏ	𑆏	क्रालोई	कें	králou ee,...	ae in aerie.
ऐ	ਐ	𑆐	त्रालोऐ	कै	tralou ai, ..	ai in aisle.
ओ	ਓ	𑆑	उलाउ	कों	ulháwoo, ...	oe in o'er or roe.
औ	ਔ	𑆒	अशदीआ	कौं	ashadeeá, ...	ou in our.
अं	ਅਂ	𑆁	मस्फेरं	कं	maspheram,	the nasal dot.
अः	ਅਃ	𑆂	दोफ्योरः	कः	dophyorah,	aspirate dots.

Sanscrit.	*Gurmukhee.*	*Sháradá.*	*Name.*	*With Consonant.*	*Name.*	*Value of a Letter.*
क	ਕ	क	कौक		kouka, .. k	in king.
ख	ਖ	ख	खुनिख		khunikha, .. kh	in ask him.
ग	ਗ	ग	गगर्ग		gagarga, ... g	in got.
घ	ਘ	घ	गाघ्रग		gágha ...	gh in hog hunt; or dg in pledge.
ङ	ਙ	ङ	नाकुगन		nárugna, ng	in king.
च	ਚ	च	चाटुच		tsátu tsa,	ts in prints; ch in church.
छ	ਛ	छ	छुरिजछ		tssuting tss,	tsh in fits him; chh in fetch him (tch.)
ज	ਜ	ज	जरैज		zaee za,	... z and j.
झ	ਝ	झ	जोशिजझ		zháshing za,	za, zh and jh.
ञ	ਞ	ञ	खुनञटजे		khunaputa nye,	ny as gn in digne.
ट	ਟ	ट	अर्मीट		armanta ... t	(not t.)
ठ	ਠ	०	सर्मीठ		sarmánta, .. th	(not th.)
ड	ਡ	ड	डुड		duda, ... d	(not D.)
ढ	ਢ	ढ	टकढ		dhakadha, .. dh	(not dh.)
ण	ਣ	ण	नानगुरिन		nánagurina ṇ	(the English harsh.)
त	ਤ	त	तोवत		towata, ... t	the Continental.
थ	ਥ	थ	थाजिथ		thaji sha, .. th	the Continental.

Sanscrit.	*Gurmukhee.*	*Shárdá.*	*Name.*	*With Consonant.*	*Name.*	*Value of a Letter.*
द	द	ऊ	ददौद		dadou dad,...	} the Continental.
ध	ध	ए	द्वजिद		doojy da,.. dh	}
न	ऊ	न	नस्तून		nastoo na, . n	Ditto.
प	प	थ	पउर्प		paoorpa ... p	
फ	ढ	ढ	फ़ुरिज		phurinya ... ph in uphold.	
व	ब	व	बुब		buba ... b	
भ	ऊ	रु	बाइब		baiba, ... bh in abhor.	
म	म	म	मौम		mouma, ... m	
य	ज	य	यायये		yáwaye, ... y	
र	व	व	रकार		rakara, ... r	
ल	ऊ	ल	लावल्ल		láwala, ... l	
व	ष	व	वशिव		washinva, . w	
श	म	म	शकर्श		shakarshe, . sh	
ष		ष	फारिशे		phárishe, ... sh	
स	म	म	सस		susa ..., ... s	
ह	ज	ऊ	हालह		hálaha, ... h	
क्ष	ऊ	क्ः	ऊनिवठनः		kruliwath, kkh, kh,h the Sancrit.	

The language has besides the preceding,

The English

e in let.
o in hot.
ae in aerie.
au in cause.
oa in oar.

It has not the Arabic *kh* and *gh*, nor the *q* or *k* in quoit, the hickup *d,k*, nor the hickup ع. and substitutes *ph* generally for *f*.

The nasal dot answers to the *qn*, *n* in the French non, or expresses the *n* in the following words, *king*, *finch*, *flint*, and the *m* in *plump*.

There are three *lll*, the English final and Italian *gl*.

Besides the usual *h*, there is the indication of one at the end of many words which I have expressed by raising it above the line. Ex. *lu*^{h} a fox, *su*^{h} a lion, *tsu*^{h} thou; *zu*^{h} 2, besides the *u* full there is the French *u* of reçu, which I have rendered by ú as *dúnga*, a kind of boat, *túnga*, a sob, *súts*, tailor. There is also another long vowel which I have expressed by *aa*, it has the sound of *u* or *ea* before an *r*, as in burn, earn.

The Cashmeer *z* has often the sound of partaking of *dz*, the *ds* of "sounds."

It has not the Arabic *th* in think, and *th* in those.

There is also another vowel between *a* and *i*, which might be expressed as *á* in *kándár*, *bahery*, *máts*, earth, *ráts*, better, *yáts*, more, *pyáts*, a kind of grass.

Of the Diphthongs.

In these consists the chief difficulty of speaking the language.

1st. Diphthong of the short *a* and short *i* (ai), which might also be expressed *à* or *ai*.

Tait, a pony mare.
Kair, a beam.
Zair, a deaf woman.
Bair, a crack in wood.
Mair, a hut.
Nair, lower part of arm.
Air, well in health.
Ais, we.
Bait, a hob.
Jair, mounted as jewels.
Dair, a robust woman.
Tsait, cut, (f.)
Zait, old, tattered.
Rait, taken, (f.)
Wait, rolled up, (f.)
Baid, a woman of rank.
Gair, a pitcher.
Tssairr, empty, much.
Bhair, a she ass.
Tair, chair, a chattering woman.
Wair, a dried peas pudding.
Pait, a small plank.
Khait, concealed, (f.)
Phait, drowned, (f.)

In the Persian character *tait* is written تَتْ but if pronounced *tati*, means "really, actually a pony mare." It could not be written taty, but might be written tati, with the *i* above the line; how it and the other diphthongs or rather compound vowels should be printed, others must determine.

2d. Diphthong of the short *a* and short *u*, taut, a poney تَتْ pronounced something like *toe ut*, but not *tatu*.

Baud, a great man.	Thaud, a tall man.
Bhaul, open, loose.	Tsaud, a round basin.
Waud, tied.	Gaud, a hole.
Daud, burnt, (m.)	Tsaut, torn, (m.)
Khaut, concealed.	Phaut, drowned, (m.)
Waut, arisen.	Raut, taken.
Laud, made.	Maut, mad.
Khaud, pudendum.	Laut, nearly dumb.
Kaul, dumb.	Daul, skirt.
Naul, a shell.	Tsaul, escaped.
Waul, drest.	Daul, slipped.
Baul, recovered in health.	Naur, sleeve.
Baur, a large crack in wood.	Tsaur, mare.
Gaur, made.	Jaur, mounted as jewels.

This compound vowel appears an *o* not so long as *oe* in roe, and not so short as *o* in hot. It might be written *ai*, the short *u* thus seems to indicate the masculine, as the short *i* does the feminine gender.

3. Diphthong of the short *u* and short *i*.

Guir, a mare, گُرِ pronounced not as if written *gury*, but rather as *gur*^{i}.

Shuir, a virgin.	Duiny, walnuts.
Luits, light, (f.)	Tuiny, navel.
Muij, a reddish.	Muits, fallen off in flesh.
Suil, spare time.	Tuij, raised.
Buil, proper name of woman.	Duij, simple woman.
Kuib, hump-backed, (pl.)	Tuil, antimony, pencil.
Wuith, arisen, (pl.)	Duib, washermen.
Guit, emaciated, a plait in sewing.	Luit, light, (pl.)
Wuit, passages.	Wuiny, now.
Khuit, part of a boat.	Buit, face.

It might be conjectured that the above *u* could be written as a *w* as gwir.

Guri, means horses, and gur^{i}, mares.

4th. Diphthong of the short *i* and short *u*.

Liul, لِلُ, a vessel for cooking rice.

Biun, set up in business in the world.

Piul, a testicle.
Diul, a soft grass used for packing and matting.
Tsiul, squeezed.
Jiur, granular parts of rice.
Chhiut, white.
Tiut, bitter.
Asiup, emaciated.
Piun, to fall.
Nium, to take away.
Khiun, to eat.
Lium, plastered.
Ziun, to be born.
Miul, reconciliation.
Siut, grief, misfortune.
Jiut, wan.
Kiut, on account of.
Kiul, a peg.
Tsiut, leavings.
Diun, to give.
Chiun, to drink.
Tsuin, a pillar.
Miun, measured.

This *i* is not exactly a *y*.

5th. Diphthong of the short *i* and short *a*.

Piak, thou fallest.
Diad, mother.
Mias, a root in a lake.
Chias, drink of him.
Tsiab, heart.
Tiat, interested friendship.
Diakh, angry.
Tsiad, patience.
Tsial, squeezed, shampoeing.
Hial, lake weed.
Liad, litter horse.
Vias, a woman's confidante.
Khias, eat of him.
Viat, name of river.
Khiat, eaten.
Riakh, a fowl's dung.
Chhiab, thou art, (f.)
Bhiak, thou eatest or eat thou.
Diál, skin, peal.
Zial, cream.

6th. Diphthong, the short *u* and the English *o* in hot.

Duod, milk, دُوَد not dwod.

Buod, understanding.
Khood, a pit.
Tsuol, a large kettle, stone of masonry.
Muol, price.
Puot, piles.
Suobh, happiness, contentment, peace.
Duokh, pain.
Chhuok, wound.
Nuosh, daughter-in-law.
Kruok, a snoar.
Suon, golde, rival wife.
Buon, below.
Wuol, dregs of butter.
Guon, a heap.
Huod, a fool.
Wuod, scalp.
Zuol, drowsiness.
Wuot, rice.
Tsuot, any.
Muokh, cheek.
Duos, wall.
Khuot, false.
Tsuon, to these four.
Kruon, misery.
Bhuon, elbow.

7th. Diphthong of shortened *ai* of aisle, and the short *a* (as in by, and not bye,) care must be taken to drop the indication of an *e* at the end of the letter *i*, as pronounced eye.

The pronunciation of eye according to this system, would be *ai i*, but this dipthong is *ai a*.

Aiat, eight
Aiar, own
Vaias, a year
Daian, a fine
Laias, a glutton
Jaiar, pleasure, excursion
Maial, desire
Ghaial, name of a favorite resort in Cashmeer
Saiad, a sayud
Maian, a frog
Zaian, a wooden bucket
Aiab, defect
Vaiad, a caste
Paiat, a market
Aiash, enjoyment
Saiat, a wick
Waiar, enmity
Saial, flood
Raian, a caste
Maiat, a corpse

7th. Diphthong of a double or prolonged short *a* (*aa.*)

Chaauy, thine
Praauy, old, (f.)
Dyaauy, tea churns
Jaauy, life
Zaauy, acquaintance
Braar, a cat, (f.)
Chaar, an idiot, (f.)
A'as, mouth
Kraauy, relations
Naauy, grand-mother
Siaauy, clever.
Tsaauy I have brought in
Dyaar, a rich woman
Aar, an owl
Kaar, neck
Tsaar, I have selected, (f.)
Kraar, wife of potter
Pyaar, dear, (f.)
Vyaar, a spiteful woman
Waar, a kitchen garden plot
Byaali, seeds
Myaauy, mine
Paar, a little cottage
Gaar, kernel of singará
Praar, dear in price
Laar, she ran after me, a cucumber
Jaar, I have lectured (her)
Jaar, keeper of her word

Maauush, a male buffalo, } would seen to be different forms of this diph-
Maaiush, a female ditto, } thong

A'aas, mouth, is properly a distinct diphthong.

Examples of the English, *au* in cause.

Kaushur, a Cashmeerian
Tsaudur, name of a village
Wauwur, a weaver
Waudur, a champion
Pauwur, a cottager
Mauruk, they have killed
Chauruk, they have tightened, or dunned
Wauluk, they have brought down
Pauwuk, they have thrown down
Bauwuk, they have unbosomed themselves
Rauwuk, they have lost
Sauwuk, they have put to sleep
Chauwuk, they have made drink
Mauzur, a cripple
Khauwur, left, (not right)
Bhauruk, they have extracted
Sauruck, they have ferried over

Examples of the English *oa* in oar, written in the Persian character as an alif. In some words there is a slight indication of an *i* preceding.

Broar, a cat
Choar, a simpleton
Pishoal, soft
Dyoar, a rich man

Byoal, seed
Dyoan, a forked cylinder or circular fork for stirring tea
Proan, old
Prioat, we have pierced
Pioas, I have fallen
Nioav, we have had taken away
Prioav, we have obtained
Likhoav, we have had written
Kroar, a scab
Myoan, mine, (m)
Prioar, dear, last year's
Bhious, we have eaten of him
Chioas, we have drunk of him
Krioar, husbandman's festival
Limoav, we have had plastered
Pitoav, we have reconciled
Shoal, a kind of grain

This *oa* seems to denote the masculine, (myoan, mine,) as *aa* does the feminine, (myaany, mine.)

Examples of the English short *a* in England.

Basak, ducks
Wanak, thou sayest
Bhatak, thou hidest
Phachack, be drowned
Ganak, congeal
Manak, obey
Ratak, take
Barak, regret
Zarak, pine after
Alak, shake.
Walak, throw over you
Galak, melt
Marak, die
Tsatak, tear
Tsalak, run away
Watah, roll up
Pakak, thou goest
Rachak, thou keepest
Ranak, thou cookest
Khanak, thou diggest
Menak, measure
Asak, laugh
Dazak, be burnt
Sarak, remember
Malak, rub
Shalak, a beating
Khalak, drive away, (flies)
Balak, recover
Dalak, slip

There is another vowel, the *ea* of earn, not so long as the one I have expressed by *aa*.

Examples of the *a* (á) of the English ark.

Pánts, five
Wánts, a curse
Lánz, a stake
Lánk, a step
Dáng, a club
Bánd, a dancing boy
Shánd, a pillow
Chánd, the centre of a shawl or handkerchief
Shánk, suspicion
Wán, a shop
Mánd, working of dough
Tánch, quizzing
Dán, cooking place
Tsánts, deception
Lánts, an eunuch
Wánk, a ringlet
Tánk, a bit
Báng, call to prayers
Dánd, bullocks
Bránd, a verandah
Chhán, a carpenter
Prán, onion
Rán, thigh
Mánch, honey
Kánch, glass

Examples of the short English *i* in bit.

Nish, near
Rish, spite
Dish, country people
Phish, a few threads or straws
Nis, take away to him
This, noise of a crack
Yis, come to him
Yin, are coming
Yik, come thou
Jin, melt
Nin, take away
Sil, disease of consumption
Vil, a short space of time
Gil, a kind of bird
Tsit, loss of use of limbs
Bit, power
Gith, a rush of water, bothering
Sit, sound
Chir, stream of milk of animals sucked by a child
Jin, Genii
Hin, an accomplishment
Hish ! to drive away fowls
Phish ! to a child
Mish, a splinter
Dis, give him
Phis, whisperings
Kis, little finger of what kind
Yim, these come to me
Sis, a wart
Din, they give
Min, measure
Pil, reach
Kil, a thrust
Chil, a stake in the water, religious seclusion
Sir, a secret
Nit, taken away
Chit, mind
Gin, count
Zid, revenge, spite

Example of the *ee* in the English see.

Teer, rams
Pheer, she rambled
Cheer, I have squeezed, (f.)
Veer, a willow
Zeer, a punch in the ribs
Heer, head of a sheep
Sheer, I have arranged, (f.)
Neer, near ! (feminine relation,) she came out
Geer, I have surrounded, (f.)
Sheer, a broom
Seer, crazy, (f.)
Yeer, we have

Example of the short *u* in the English bull.

Gur, a horse
Zur, grandson
Chur, have rinsed
Shur, a male child
Hur, surplus
Wun, have woven
Dun, have shaken
Jun, deep emerged
Num, have beaten out
Tul, have lifted
Kul, a tree
Kub, hump-backed
Shup, a sift
Tsup, silent
Dup, sunshine
Tuk, have torn with teeth
Tsuk, sour
Kus, who
Hus, to set on, to quarrel
Tut, tight, under restraint
Rut, right, (not wrong)
Jhut, a sip
Kut, wetted
Mut, evaporated
Phut, a basket
Buz, parched
Wuz, bubbled up
Huk, dried
Kun, sold
Kud, a name explained

Buj, have thought on
Rul, stray, unclaimed
Tsun, have put in
Kuts, got well
Kut, got wet
Bum, a vine in the water
Hum, they
Yun, to come
Wur, rice boiled dry, have strung
Mur, to rub between hands
Wul, a hole
Kur, force to take
Kun, have sold
Hun, has swollen
Run, one-handed
Lun, have reaped
Nun, saltish
Zul, have shaped, scraped
Dub, a Dhobee, a sound
Gub, heavy
Thup, a fruit basket
Kup, a dabba
Rup, complexion, countenance

Zuk, down
Rus, have taken huff
Mus, small turnip, fatigued
Yus, whoever
Jut, we have gained
Sut, incapable
Hut, spoiled, turned bad
Lut, light, (not heavy)
Yut, hire
Mur, skirt
Shuz, unalloyed, untasted
Luk, strangers
Dukh, pain
Hud, rice, alone
Duj, a foot
Dul, a cullender
Gun, knead
Kuz, a cup of sugar-candy
Wut, rose up
Wush, a sigh
Rum, a single hair
Wut, drizzling

Examples of the English *oo* in fool.

Tsoor, a thief, loosening roots of plants
Moor, rubbing planted grain between the hands to remove the husk
Loor, have demolished,
Choor, have rinsed
Khoor, razor
Goor, a milk maid
Door, a breeches string
Soour, a hog, is finished, exhausted
Poo, a sound of derision by making a trumpet of the hand
Hoor, I have discharged
Joo, affix to names of Cashmeerees
Zoor, wooden candlestick
Soo, have sewn
Doo, have swept
Koor, a virgin
Door, an alley
Poor, I have filled up
Shoor, I have arranged
Toor, a small metal saucer

Noor, name of woman
Roo, have planted
Moor, a hole
Joor, have collected
Groost, cultivator
Goour, a milkman } would seem to be different diphthongs.
Gooir, a milkmaid }
Khyoost, for shame!
Myoot, a kiss
Tsyoot, have masked
Vyoot, fat
Nyook, have carried him away
Nyool, green, not ripe
Gyool, we ridiculed
Nyoor, pasturage near, made on it
Shoor, have arranged
Khyoor, an oar
Pyoor, fat, (animal)
Jyoor, a simpleton
Ryoog, a flower
Roog, ill
Lyook, we have written

Toor, cold weather
Zoo, life
Yoo, come
Phiroost, lucky
Zyoot, tall
Tyoot, bitter
Pyoos, have pounded
Byoot, seated
Nyool, he met me
Tsyoon, became on our guard, have guessed at
Tyoor, a ram
Kroor, a well
Diroor, skin
Gyoor, have encompassed
Vyoog, a trap door
Chhool, a kid
Dyoot, we have seen
Nyook, they have taken (him)away

In the following there is an indications of an *i*.

Hooir, a house
Mooil, a root
Looir, a walking stick
Gooily, a bullet

There is another *oo* compressed between the teeth.

Toorf, cold weather
Booily, song of bird
Looily, affectionate
Gooily, kernels
Gooiri, here
Hoon, a dog
Zoon, moon
Shood, a drunkard, ruined by bad habits.
Mood, deed
Good, pudendum
Booz, we have comprehended
Toon, navel
Moon, wool of sheep, a wall
Loot, plunder
Boot, an image
Koon, corner
Poor, a step
Toor, cold
Dooily, a "dolie," deserted as an orphan
Jooily, collected in cloth
Bhooily, have released
Tooily, I have weighed them
Doon, cotton-cleaner
Roon, husband
Rood, rain, remained
Loos, fatigued
Choon, interference, part taking, flattery
Noon, salt
Woon, we have wove
Soot, puff of a pipe
Loon, we have reaped
Phoor, burnt rice at bottom of pot
Sool, we have weighed

Examples of the English *ae* in aerie.

Yael, tamed
Shaer, arrange
Waer, affection
Gaer, surround
Tsaer, delay, yellow apricot
Baer, border of garden
Fael, a crime, trick
Daes, country
Haer, ladder
Maen, measure
Zaen, earn
Tsaet, pound
Saet, a fit
Yaer, wool
Saer, a seer
Naer, come out
Phaer, traverse
Gael, ridicule
Mael, join, visit
Khaes, have ate of him
Daer, plenty, heap
Gaen, verses
Tsaen, take care
Zaet, grow
Maet, sweeten

Examples of the English *ai* in aisle.

Ropai, rupee
Ruwai, am planting
Surai, a goglet
Sulai, am putting to sleep
Kolai, a wife
Mulai, never
Wonai, am weaving
Sonai, rival wives
Bhonai, elbows
Zuwai, I am growing up
Subai, in the morning, province
Khulai, am opening
Bowai, was
Tsopai, silence
Warai, am stringing
Murai, I am hushing
Phulai, a blossom
Wolai, come thou woman
Tulai, am lifting
Wunaii, never again
Iti, not him.
Bonai, not I from below
Suwai, am serving
Kubai, boss of a shield
Bumai, eyebrows

Examples of the English *oe* in roe.

Khoei, foot
Zoer, force
Moer, vain, presumptious
Poen, heel
Moekh, cheek
Doekh, pain
Poesh, a flower
Boesh, fashion, demand in market
Loet, a roll on the ground
Roet, a kind of bread
Loess, be tired
Woer, chatter
Soer, a hog
Tsoer, 4, a caste
Toel, a weight
Loel, desire
Boel, determination
Roesh, be offended then!
Woesh, a sigh
Tsoet, a bruise
Moet, a grain
Goess, I went

There is a shorter *o*, as the *o* of holy, while this is the *o* of hole.

Examples of the English *ou* in our.

You, yesterday
Zou, joke with
Gou, went
Pyou, he fell
Ryou, be conceited
Zyou, tongue
Pyou, light (the fire)
Khou, a pit
Bou, has been
Lou, dew
Chou, have drunk
Khyou, have eaten
Lyou, lick
Myou, mew! of a cat
Nou, new
Hou, yes

On Gender, the formation of.

	Masculine.	*Feminine.*
1	Gur, a horse	Guir, a mare
2	Kokur, a cock	Kokair, a hen
	Kautur, a cock pigeon	Kautair, a hen pigeon
3	Kukiul, a ditto, (blue)	Kukil, ditto, (blue)

	Masculine.	*Feminine.*
4	Tssáwul, a he-goat Wátul, a sweeper Pahul, a shepherd	Tssáwijj, a she-goat Wátij, a female sweeper Pahij, a shepherdess
5	Batuk, a drake	Batich, a duck
6	Laung, lame man	Lainj, lame woman
7	Phaur, a male ass	Phair, a female ass
8	Chhán, a carpenter	Chhaany, carpenter's wife
9	Tsroal, a jailer	Tsraaj, wife of jailer
10	Káv, a crow	Káviny, a hen-crow
11	Hoon, a dog	Hoony, a bitch
12	Pániur, a drawer of water in pitchers.	Pániureny, wife of water-carrier
13	Manur, a lapidary Khár, a blacksmith	Manar báee, wife of ditto Kharabáee, wife of ditto
14	Groost, a cultivator	Greest báee, wife of ditto
15	Jyayur pachhun, the fabulous seemurgh.	Jyagar pachhiny, the female
16	Mohnyn, a man	Zanána, a woman
17	Háput, a bear	Háputs, female
18	Suʰ, a lion	Seeminy, a lioness
19	Shál, a jackal	Shaaj, female
20	Patssalau,o, a lynx	Patssalaav, female
21	Luʰ, a fox	Laash, female
22	Yár madun, a lover	Vyes, a mistress
23	Goant, a hill poney	Gánt, mare
24	Toata, a parrot	Tooti, female
25	Maa,unsh, a buffalo	Maainsh, female
26	Gán, a bully	Gaany, a bawd
27	Koan, a blind man	Kaany, woman
28	Ná,id, a barber	Ná iz, wife
29	Wouwur, a weaver	Wouwureny, wife
30	Airz, a gander	Airziny, a goose
31	Yachh, an ogre	Yachhiny, an ogress
32	Hánz, a boatman	Hánzainy, wife
33	Woany, a trader, mussulman	Wáinyainy, wife
34	Koaka, nurse's husband	Dái, a nurse
35	Parzun, a male servant	Wula gásheny, female
36	Ghulám, a slave	Tsunz, a female slave
37	Woarud, a 2d husband	Woarudz, 2d wife
38	An hóhur, a batchelor	An harish, a maiden
39	Pushut, a straw slipper-maker	Pushainy, wife
40	Bachhera, a colt	Bachheer, a filly
41	Dodagoo,ur, milk man	Dodagooir, wife
42	Batu, a Hindoo	Batainy, wife
43	Rántun, demon	Rántats, Rántas, } female
44	Haund, a ram	Gaib, a ewe

A man speaking says, buchhus, I am—and a woman, bachhas, ditto.

Me^{h} che,i chá,i. I have drank tea, (f:)

Me^{h} khyou tsoont, I have eat an apple, (m:)

NUMBER.

Singular.	*Plural.*
Mohnyn, a man	Mahnivi, men
Tssáwul, he-goat	Tsáwilli, goats
Gur, horse	Gurri, horses
Wagoo, a mat	Wagivi, mats
Tsoed, a small pitcher	Tsaddi, pitchers
Gaund, a log of wood	Gandi, logs
Zaur, deaf man	Zarri, men
Goor, milk man	Goorri, milkmen
Lopun, a grain vessel	Lopuin, vessels
Naut, a pitcher	Natti, pitchers
Latsul, a broom	Latsil, brooms
Liul, a vessel, earthen	Lilli, vessels
Budh, old man	Buidhi, old men
Tsaut, a dwarf	Tsuiti, dwarfs
Thaud, lanky	Thadi, lanky men
Pohul, shepherd	Pahalli, shepherds
Groost, a cultivator	Greestt, cultivators
Buhur, a druggist	Buhirri, druggists
Tsroal, a police man	Tsraalli, policemen
Hoon, dog	Hoonni, dogs
Broar, cat	Braerri, cats
Lu^{h}, a fox	La^{h}, foxes
Pottul, an image	Potilli, images
Punz, monkey	Pa,inzi, monkeys
Kándur, a baker	Kandarr, bakers
Aar, an owl	Árre, owls
Khon, elbow	Khonā, elbows
Batuk, duck	Batak, ducks
Hángul, a jamber	Hángul, "jambers"
Wátul, a sweeper	Wátal, sweepers
Kokur, a cock	Kokar, cocks
Kántur, cock-sparrow	Kántar, sparrows
Saruph, a snake	Saraph, snakes
Wandur, a monkey	Wándar, monkeys

DECLENSION.

Singular.	*Plural.*
Gur, horse	Guri, horses
Gursund, a horse's	Gurin hund, horses'
Guris, to horse	Guren, to horses

Guris and gurnen being each the inflected case of its number, any past position can be added, as

Guris nisha, from the horse
Guris nish, near the horse

Guris pyat, on the horse

Nechu, son
Nechivi sund, of son
Nechavis, to son
Hata nechavi, oh! son

Nechivi, sons
Nechiven hund, sons'
Nechiven, to sons
Haugo nechavyou, oh! sons

Inflected Case.

Nechavi. Nechiven.

Dái, a nurse
Dái hiund, of nurse
Dái, to nurse
Hatai dá,ee, oh! nurse

Dáya, nurses
Dáyan hund, of nurses
Dáyan, to nurses
Hatai dáyou, oh! nurses

Kolai, a wife
Kolai hiund, of wife
Kolaiyi, to wife

Kolaiye^{h}, wives
Kolaiyan hund, of wives
Kolaiyan, to wives

Khou, a pit
Khou hund, of pit
Khavi, to pit

Khouva, a pits
Khounan hund, of pits
Khovun, to pits

The affix to the Genitive Case has also Gender, thus:—

Nechiv sund nechu, son's son
Nechiv sánz koor, son's daughter

Shur, a child
Shur hen, a poor little child

Answering to the Persian affix *k*, dku*h*tar, duk*h*tarak

There is an affix *han* or *hen*, which has a diminishing meaning.

Tsuit, bread
Rati pauny, good or sweet water
Rati pauny
Rati pányuk
Ratis pányis
Rati pányi nisha

Tsochahen, a bit of bread
Riti pány
Riten pánin hund
Rit you pànyuk
Rityan pányan
Rityou pányou nisha

Comparison.

Rut, dood
Yats rut, very good, (rats, f)
Rati khuota rut, better, (best)
Literally good, beyond good

Pronouns.

I, boh
Mine, myoan myaiany
Me, meh
Myáni khatra, for my sake,
Sáni khátra, for our sakes,
Myanen, my, (adjective)
Sányan, our, (ditto)
Myani nechivi, oh ! my son
Thou, tsuʰ
Thine, choan, (chaiany)
Thee, tseḥ
Cháni khátar, for thy sake
Tse,pyat, on thee
Tuhindi khatar, for your sakes
Tohi pyat, on you
Aass, we
Saiany, ours, soan
Asi, us
Meʰ pyat, on me
Asi pyat, on us
Tuhhi, ye
Tuhuindi, your
Tohi, you
Tsenish, from thee

He, suʰ
His, tamsund
Him, tamis tas
Tas nisha, from him
Tamis pyat, on him
Tim, they
Tuhund, theirs
Timun, them
Lagu, be at ; lágus, beat him
Tits, like him

This, yiʰ
Of this, yemsund
To this, yemis
Yemsindi, k*h*atra
Yemis pyat, on this
Yim, these
Yuhund, of these
Yiman, to these
Yihindi, k*h*átra
Yits, like this

That, huʰ
Of that, humsund
To that, humis,
Humsind,i
Hum, those
Humanhund, of those
Human, to those
K*h*átara, for his sake

Myoangur, my horse
Myaiany gurri, my horses
Who
Whose
Whom,
Soangur, our horse
Saiany gurri, our horses
Kus
Kemsund, kohund
Kas kamis

Kamsindi, Kahindi, Kasindi, } khátar	For whose sake
Kamis pyat	On whom

Which	Kyá
Of what	Kamyuk
To what	Kath
Kath kyut	On what account
Kami bápat	For what reason
Kamis pyat	On what

Self, pána	Paany pánai, of own accord
Of self, panun	
To self, pánas	Pánanyen, own, (*adjective*)
Panani khátar	For own, sake
Pánas pyat,	Pána waany, among themselves
Parat akhá	Every one

Yas tas yamis tanus	To whomsoever
Yamsund tamsund	Of whomsoever
Yus, (*m.*) yas, (*f.*)	Who ever
Yus akhá	Whosoever, whatever one
Kas akis	To which one
Kamis akisund	Of which one
Kas akis nisha	From which one

VERBS.

Auxiliary Verb *ásun*, to be.

Present Tense.

Bo^{h} chus,	Aass chi^{h}
Tsu^{h} chuk	Tohi chuwa^{h}
Su^{h} chu	Tim che

Perfect Past Tense.

Bo^{h} ásus	Assi aais
Tsu^{h} ásuk	Tohi aasiwu
Su^{h} aus	Tim aais

Imperfect Past Tense.

Asus ásán	Aais ásán
Asuk ásán	Asyu àsan
Aus ásán	Aais ásán

Future Tense.

Bo^{h} yats ásun	Assi yat son ásán
Tsu^{h} yatsah ásun	Tuhi yat su ásun
Su^{h} yatsi ásun	Tim yat sau asun

Imperative Mood.

Sta ás	Tuhi ásiw

SUBJUNCTIVE MOOD.

Present Tense.

Bo^{h} ása	Assi assou
Tsuh ásah	Tuhi ásur
Suh ási	Tim ásan

Perfect Tense.

Bo^{h} ásaha	Assi ásahou
Tsu^{h} ásahak	Tuhi āsahyoo
Su^{h} ásahe	Tim ásahan

Pluperfect Past Tense.

Asus ásmut	Aais aasmit
Asuk ásmut	Aasyu aasmit
Aus ásmut	Aais aasmit

CONJUGATION OF THE VERB

Sapadun, to become.

Present Tense.

Bo^{h} sapada, (za,)	Aass sapadon
Tsú^{h} sapadah	Tuhi sapazeev
Su^{h} sapadi	Tim sapadan.

Imperfect Past Tense.

Bo^{h} ásus sapadán	Assi aais sapadan
Tsú^{h} ásuh sapadán	Tuhi aasyn sapudan
Su^{h} aus sapadán	Tim aais sapadán

Perfect Past Tense.

Bo^{h} sapadus	Aas sapidd
Tsú^{h} sapaduh	Ttuhi sapadiv
Su^{h} sapud	Tim sapidd

Pluperfect Past Tense.

Bu ásus sapudmut	Assi aais sapidmit
Tsú^{h} ásuh sapudmut	Ttuhi aasyn sapidmit
Su^{h} aus sapudmut	Tim aais sapidmit

IMPERATIVE MOOD.

Sapadawun, becomes

Stu sapad	Ttuhi sapadiv

SUBJUNCTIVE MOOD.

Judwai, if.

Present Tense.

Same as Indicative Mood.

Perfect Past Tense.

Boʰ sapadahá	Aais sapadahon
Tsuʰ sapadahak	Ttuhi sapadahiv
Suʰ sapadaha	Tim sapadahan

CONJUGATION OF THE VERB

Dapun, to speak.

INDICATIVE MOOD.

Present Tense.

Boʰ chus dapán	Aass chiʰ dapán
Tsuʰ chuk dapán	Ttuhi chooʰ dapán
Suʰ choo dapán	Tim chiʰ dapán

Imperfect Past Tense.

Boʰ asus dapán	Aassi aais dapán
Tsuʰ asuk dapán	Ttuhi aasoo dapán
Suʰ aus depán	Tim aais dapán

Pluperfect Past Tense.

Meʰ ous dupmut	Assi ous dupmut
Tseʰ ousu dupmut	Tohe ousoo dupmut
Tem ous dupmut	Timou ous dupmut

Perfect Past Tense.

Meʰ dup	Assi dup
Tseʰ duput	Tohe dupoo
Tem dup	Timon dup

Future Tense.

Boʰ yats dapun	Aais yatson dapun
Tsuʰ yatsak dapun	Tsuhi yatchoo dapun
Suʰ yatcha dapun	Tim yatsan dapun

IMPERATIVE MOOD.

Tsuʰ dapak	Ttuhi dapyn

SUBJUNCTIVE MOOD,

Yud wai, if.

Present Tense.

Bo^{h} dapah	Aais dapon
Tsu^{h} dapak	Ttuhi dapym
Su^{h} dapi	Tim dapan

Perfect Tense.

Bo^{h} dapaha	Aais dapahon
Tsu^{h} dapaha	Ttuhi dapayn^{h}
Su^{h} dapihe	Tim dapahan

Dapawun, *speaker.*

CONJUGATION OF THE VERB.

Yun, to come, *(feminine.)*

INDICATIVE MOOD.

Present Tense.

Bo^{h} yumuga	Aais yimoee
Tsu^{h} yikai	Ttuhi yeewai
Sa^{h} yee	Tima yin

Imperfect Past Tense.

Ba yimahai	Aais ási yuván
Tsa aasuik giwán	Ttuhi ásawai yuván
Sa^{h} ass yuván	Tima ása yuván

Perfect Past Tense.

Bo^{h} áyis	Aais ái
Tsa áyik	Ttuhi áyawa
Sa á,i	Tima á,i

Pluperfect Past Tense.

Boh ásus ámuts	Aais ása ámatsa
Tsa ásuk ámuts	Ttuhi ásawa ámatsa
Sa ás ámuts	Tima ása ámatsa.

Future Tense.

Boh yatsai yun	Aais yatso,i yun
Tsi yatsak yun	Ttuhi yatswai yun
Sa yatsi yun	Tima yatsan yun

IMPERATIVE MOOD.

Tsa yih	Tsuhi yeewe

SUBJUNCTIVE MOOD.

Present Tense.

Feminine.	*Masculine.*
Yimai	Yihan
Yik	Yihyoo
Yihe	Yihan

Perfect Tense.

Yimahá	Yimahon
Yihak	Yihyoo
Yihe	Yihan
Aais nai yimoee,	We do not come, (women.)
Aais yimon nah,	Ditto ditto, (men.)

Cardinal Numbers.

1.	Akh	34.	Tsoitruh
2.	Zuh	35.	Pántsatruh
3.	Trae	36.	Sheitruh
4.	Tsoar	37.	Satatruh
5.	Pánts	38.	Aratruh
6.	Sheh	39.	Kunatajih
7.	Sat	40.	Tsatájih
8.	Aait	41.	Akatajih
9.	Noun	42.	Duitaojih
10.	Dah	43.	Te-i-taajih
11.	Keeh	44.	Tso-i-taajih
12.	Buah	45.	Pántstaajih
13.	Turwa	46.	She-i-tájih
14.	Tsoada	47.	Sata-tájih
15.	Pánda	48.	Aratájih
16.	Shura	49.	Kunawanzah
17.	Sada	50.	Pántsah
18.	Arada	51.	Akawanzah
19.	Kunawuh	52.	Duwanzah
20.	Wuh	53.	Trawanzah
21.	Akawuh	54.	Tsowanzah
22.	Zitawuh	55.	Pántswanzah
23.	Truwuh	56.	Shawanzah
24.	Tsowuh	57.	Satawanza
25.	Paaintsuh	58.	Arawanzah
26.	Shuwwuh	59.	Kunahaat
27.	Satáwuh	60.	Sháeat
28.	Aatáwuh	61.	Akahaat
29.	Kunatruh	62.	Duhaat
30.	Truh	63.	Trehaat
31.	Akatruh	64.	Tsuhaat
32.	Doitruh	65.	Pántsahaat
33.	Teitruh	66.	Shihaat

67. Satahaat
68. Arahaat
69. Kunasatat
70. Satat
71. Akasatat
72. Dusatat
73. Tresatat
74. Tsosatat
75. Pántsasatat
76. Shehsatat
77. Satasatat
78. Arasatat
79. Kunasheet
80. Sheet
81. Akasheet
82. Do,isheet
83. Treisheet
84. Tso,isheet

85. Pántsasheet
86. Sheisheet
87. Satasheet
88. Arasheet
89. Kunanamat
90. Namat
91. Akanamat
92. Dunamat
93. Trenamat
94. Tsonamat
95. Pántsanamat
96. Shehnamat
97. Satanamat
98. Aranamat
99. Namánamat
100. Hat,
1,000. Sás
1,00,000. Lach, khár, akhanvar
1,00,00,000. Kror, trah, 1-16 bhár

Jora, 2 or more
Twára, 3 or more
Tsombará, 4 or more
Paanshi, 5 or more
Noanmara 9 or so
1st. Godaniuk
2d. Dugum
3d. Treium
4th. Tsorium
5th. Paintsium
6th. Sheyum
7th. Satium
8th. Aatium
9th. Nowwium
10th. Dohium
Mohar, a goldmohur
Ropai, a rupee

Páwul, $\frac{1}{4}$ ditto
Aad ropai, $\frac{1}{4}$ ditto
Anna, an anna, 1-16 ditto
Toonk, a tanga, paainsa, a pais
Bahágany, $\frac{1}{8}$ pais, poontsu, $\frac{1}{4}$ ditto
Adhiul, $\frac{1}{2}$ pais
Hár a cowrie
Pánzuh, $\frac{1}{2}$ trah
Manut, $\frac{1}{4}$ ditto
Admium, $\frac{1}{8}$ ditto
Dodpáv, 1-16 ditto
Trechatang, 1-32 ditto
Dod Chatang, 1-64 ditto
Chatang, chuttack
Shat-o-pánts kah, 6 and 5 are 11
Zuh trucha sheh, 2×3= f.

Days of the Week.

Saturday, Batawár
Sunday, Atwar
Monday, Tsandrwár,
Tuesday, Bomwár,
Wednesday, Bodwár
Thursday, Wraswár
Friday, Jumá

Months of the Year.

Wahek,
Zeth,
Hár,
Shrawan,
Baudur,
Aashid,
Kártik,
Munjhar,
Pohi,
Mag,
Phágun,
Tsitr

(To be continued.)

View of the principal Political Events that occurred in the Carnatic, from the dissolution of the Ancient Hindoo Government in 1564 *till the Mogul Government was established in* 1687, *on the Conquest of the Capitals of Beejapoor and Golconda; compiled from various Authentic Memoirs and Original MSS., collected chiefly within the last ten years, and referred to in the Notes at the bottom of each page.* By Colonel Mackenzie.

[Submitted at a Meeting held on the 5th April, 1815.]

1. To give an idea of the state of the whole Carnatic at this period, which forms a remarkable era in the history of this part of India, it may be useful to take a rapid view of the events preceding this period for the last hundred and twenty years, since the overthrow of the last Hindoo government of the Carnatic, commonly called the Raia-Samastanum of Beejanuggur.

A. D. 1564 to 1687.

2. While that government subsisted in its vigor, specially towards the decline of the last dynasty of Beejanuggur, it appears to have been conducted under certain polity, adapted to the general spirit of Hindoo jurisprudence, and this system was regularly established in the provinces subjected to their authority from the furthest limits (of Goa and of Calinga) on either coast to Cape Comorin South, in progression as they were gradually reduced.

Ancient Hindoo system of government in the Carnatic.

3. The names, titles, and duties of a variety of officers are still preserved which formed the court, and supported the state of the ancient monarchy while the provincial government was conducted by Dan-Naiks,* Naiks, Naad† Prabhoos, Poligars,‡ and a regular gradation of subordinate officers, who were allowed lands in Hoombliga,§ Amara, or as Polliams, held of the sovereign or raja, by a species of tenure much resembling the European fiefs, subject to a certain assessment of revenue, under regular admeasurement, or estimate of productions, or annexed to their respective

Extended into the provinces as they were reduced progressively.

* The Dan-Naiks and Naiks, (Viceroys and Lieutenants,) were also part of the Tellinga system.—See Memoir of Waruncull Tell.

† Naad-Prabhoo, *i. e.* Lord or Governor of a Naad or Province.—See Bangalore Memoir, Mar.

‡ For the origin of Polligars, see Memoirs of Nidicull, Ballapoor, Maggry, &c. Mar. and Can.

§ For Hoombliga and Amara tenures, see Memoirs of Holla-Honore and Soobiah's compilation, Can.

appointments, in lieu of salary or wages according to the nature of the service. It would appear that these appointments were generally hereditary in the eldest son; though a confirmation was expected, and a recognizance solicited on each succession, accompanied by douceurs, gifts, and offerings, the origin perhaps of fees of a like nature in European tenures; but defects from want of talents, from crimes, and from disloyalty, were sufficient to disqualify and lay aside the eldest son; though a regard to propinquity was so far observed, that the nephew not unfrequently succeeded the uncle, and stept in during the minority of the real heir, who in his turn, assumed his station in the natural course, by domestic arrangement, by fraud, or by violence; this is particularly remarked in the Bednore* and Mysore history. Evident traces of such variations appear in the mutilated accounts still preserved, and of the appointments of the great officers and functionaries; and though our knowledge of the real state of the great mass of the population be more obscure, there is reason to presume, that the condition of the lower orders in the country South of the Kistna, had never varied much under this government of Beejanuggur in their relations to the paramount sovereignty, from that which under the general system had from time immemorial prevailed throughout India; this holds at least to the period previous to the dissolution of the *Southern*† *monarchy,* which being first shaken by the celebrated battle with the confederate Moslem princes near the banks of the Kistna, continued to linger under a gradual decline till the last branch, whose titles‡ were barely acknowledged, was expelled from their last fortress in the Carnatic, about twenty-eight years afterwards.

Officers granted in hereditary succession.

Condition of the general mass of the people.

A. D. 1646.

* See Historical Memoirs of Bednore, Mysore, Chittledroog, and Serah, which throw considerable light on this subject.

† This is meant here to apply to the Beejanuggur government; the system that prevailed among the Dravida nation seems in some respect to have been different, and more attention was paid to the privileges and rights of the subject.—See their grants; but the Beejanugur government appears to have respected these privileges after they had acquired the supreme authority over the country.

‡ See Grant No. 1 of the Mysore Rajahs, where the several titles of the Rayel are still observed, though that chief had entirely thrown off all the authority of the paramount sovereign. A. D. 1613.

4. The dissolution of the Hindoo monarchy in the rapid course of human events was throughout the Carnatic followed by long series of disorder, of anarchy, and of confusion, whence their laws, institutions, and privileges were involved in an obscurity,* that renders it difficult to clear up difficulties arising from the intermixture of new arrangements with ancient customs; but it is hoped, that the following notes taken in the course of examining several documents that have fallen in our way, if they do not satisfactorily explain some of these obscurities, may at least excite to a clearer development.

5. After that battle, in which Ram Raaz, and almost the whole of the ancient nobility fell, the country around the capital was laid waste, and the remains of the great families being dispersed, the city
A. D. 1567. speedily fell to decay, as an European traveller desscribes it two years afterwards,† and recent inspection confirms the accuracy of that description.

6. It appears, that the allies after the battle‡ marched as far as Anagoondy, and their advanced troops penetrated to Beejanuggur itself, which they plundered, committing all manner of excess; but Venkatadri, the brother and representative of the late sovereign, giving the places which had been formerly wrested from the allies, (the Duab, Mudcull, Rachoor, Adoni, Aulingpoor and Bagratal from Adil Shah; and Kowillconda, Bankul (Pangull,) and Kunpoor (Gunpoor,) from Cootub Shah,) the victors without availing themselves further of the advantage they had obtained, were satisfied, took leave of each other at Rachoor, and returned to their several dominions without leaving any garrison, occupied South of the Toombuddra,§ excepting Adoni

* It is remarkable that this obscurity prevailed no where in a greater degree than in the immediate vicinity of our presidency of Fort St. George, where until recently, a very imperfect knowledge prevailed of the various successions or changes of government in the lower country.

† Cæsar Fredrick's Voyage A. D.——See Asiatic Miscellany, Vol. I, p.——The remains of Beejanuggur were minutely examined in December 1800.—See Journals.

‡ For the Hindoo account of this memorable battle, see the Ram-Raja Cheritra, which enters into details descriptive of Hindoo manners, but differing much from the Mahomedan authors in regard to circumstances in the war and battle.—See collection of Memoirs for the History of the Beejanuggur Government of the Carnatic.

§ For the details, see Scott, Vol. II, p. 298 and 299, also the Tarik Adil Shahee, a Persian MS. Cœlconda, Pancull and Gunpoor are hill fortresses, capitals of Circars north of the Kistna and South of Hydrabad. Mudcull, Rachoor and Bagreetal are in the Duab. Adoni is South of the Toombuddra.

and some jagheers said to have been assigned to the Bargee* chiefs about Anagoondy, and that lay near to that river.

7. We may, however, suspect, that this apparent moderation was owing rather to political motives, and to the jealousies and divisions which existed among these four confederate powers, and from no lenity to the unfortunate Hindoos; as we are told that Nizam Shah of Ahmednuggur dying immediately after this event, and being succeeded by a minor, Ali Adil Shah of Beejapoor, seizing the opportunity as favorable for his designs, moved with an army to Anagoondy, to place Tim Rajal, the son (or rather brother) of Ram Raaz on the throne of Pennaconda, and depose Venkatadri, to acquire for himself Anagoondy and Beejanuggur; but his design was defeated by Ahmednuggur chiefs being called upon for aid by Venkatadri, and Adil Shah was forced to retire from Anagoondy without effecting his purpose.† A. D. 1567.

8. But the design was not relinquished altogether, for taking advantage of a favorable conjuncture of affairs, within six years afterwards at a conference, a coalition was formed between Ali Adil Shah and Moortiza Nizam Shah, when it was agreed, that while the latter reduced Berar, the former should conquer as much of the dependencies of Beejanuggur as he could, without any interruption from Nizam Shah. We are told that from the strong fort of Adoni being a little before this time taken from one of the nobility of the late government, Ali Adil Shah's arms had acquired such reputation, that he was encouraged to resolve on other conquests, and accordingly Turkull, Daruar, Bankapoor, and other places of strength were reduced, and these successes were pursued and followed up to the reduction of the sea coast from near Goa, (which was attempted about A. D. 1567,) to Baralore, including the present districts of Soonda, Ankola, Kanore and North Canara, and the petty chieftains of that coast were forced to a reluctant submission, and governors left, who immediately began to build forts‡ to bridle their new subjects. A. D. 1567.

* It is said that at this time they left some of the Bargeers at Anagoondy, where a jagheer was granted to them.—See Scott, Vol. I.

† See Scott's Deckan, Vol. I, p. 298, 300, 301, &c.

‡ Ankola, Mirjan, Chundergooty, &c. One of the most distinguished of these new governors from Beejapoor was of Hindoo Braminical descent, brought up a Mahomedan, and his memory is still remembered in these countries with respect.—Journals.

9. These successes as usual led to further encroachments, and an army was sent against Pilconda, whence "Nagatadri is stated to have retired A. D. 1567. to Chunderghury;" but this is presumed to be erroneously stated, as Timma Rajah was settled there ten years before. These events, however, are confirmed by Hindoo authorities, and the Moslem writers attribute to the corruption of the Bargee chiefs the relief of that place, what the Hindoos ascribe rather to the intervention of their Gods and to the valor of Jagadeo-Rayel, who is supposed to have by his heroism saved the place; in consequence of which, an extensive grant of lands was added to his government,* of forty-eight provinces; the whole extending from the Baramahl West, across the upper country to Adjampoor and Holla Honoor in the modern Bednore, including the whole of that extensive tract; excepting Seringapatam and its dependencies, which were still under the feeble rule of a viceroy related to the ancient Rayel government. This government of Jagadeo's remained in that family with some changes till it was ultimately ab-
A. D. 1579. sorbed in the growing fortunes of the Mysore Wuddiers,†
A. S. 1501. which at this time comes to be noticed by its rising opposition to the wretched remains of the ancient authority, though it yet only occupied the little district about the present capital of Mysore, then scarcely known by that name.

10. The excesses of the Beejapoor Maratta jagheerdars‡ at this time,
A. D. 15. who had been stationed about Beejanuggur, or rather
A. S. 1500. at Anagoondy, to secure the new conquests, attracted the notice of that government; nor could they be suppressed till prompt measures and even treachery was used, which drove some of the more able of the Hindoo chiefs into the service of the Carnatic princes, and this contributed to give a breathing to the last remnants of the Hindoo monarchy.

11. The suspension of the Mahomedan§ conquest was further pro-

* See Denkanicotta and Chinapatam Memoirs, and several Memoirs and Districts. It appears to have stretched across the peninsula from Barramahl (which it embraced) to Azimpoor, now part of Bednore. A list of them is inserted in the District Memoirs.

† See Account of the origin of the Mysore and Bednore family.

‡ The Berjee chiefs or Bargeers; soldiers mounted on horses, the property of the Circar.—See Scott, Vol. I, p. 305.

§ The Beejapoor officers never extended their conquests along the Western coasts further than Honore, Cundapoor, and I believe Malabar or Malliallum was never subjugated by the Mahomedans till Hyder's time.

tracted by the situation of affairs in Beejapoor, where a minority, intestine broils at home, and war abroad, particularly with Ahmednuggur, constantly obstructed their plans of conquest; in the intervals, however, they seem to have turned their arms against the country of Malabar, or rather Soonda, Bednore and Koorg, whence Bahlill Cawn,* in two expeditions with various fortune collected a forced tribute; in all this time only once mention is made of the Carnatic; the Duab indeed appears to have been still occupied, and mention is made of Adoni being relieved from the attack of one of the zemindars, (as the Polligars are always denominated by the Mahomedan writers,) or more probably from one of the chiefs of the late government.

A. D. 1595. A. S. 1517.

12. Such was the state of the Northern and Western provinces of the late Carnatic government; nor were matters scarcely better in the Eastern and Southern provinces, though farther removed from the Mahomedan states. About the year 1597, Venkataputty, the representative of the ancient Rayels, and the last of them who exhibited any appearance of power, ruled with some degree of magnificence at Chundragury and Vellore; where he still held a doubtful sway over the remaining provinces of the South and East, which appear to have been ruled by Viceroys, Lieutenants or Naigs; the most distinguished of which seem to have been

1. Histnapa Naik, at Gingee.
2. ———Naik, at Tanjore.
3. ———Naik, at Madura.
4. Jaga-deo-Rayel, at Chinnapatam.
5. Trimul Raj, at Seringapatam.
6. ———— at Pennaconda.

13. Towards the end of his government,† he appears to have made

* I allude here to Scott's authorities. Much information of the transactions of the Carnatic it is hoped may be obtained on translation of several Memoirs which may illustrate or confirm each other. Near Adoni in particular, a Mahomedan jagheerdar seems to have been early fixed on the lands formerly occupied by some of the Rayel's relations.

† In the Tarik-Cootub-Shah, Vol. II, p. 647, it is mentioned, that "taking advantage of the attention of the Golconda government being taken up by the invasion of Ahmednuggur by the Mogul forces under Sultan Moraad, the son of Akber, he approached the limits of Guntoor, with a view of recovering that province; but speedily retreated on finding the Golconda officers were disposed to receive him in force, and apologized, alleging his movement was from motives of religion "to visit and perform ablutions at the great tank of Cummam," A. D. 1593 or 1595.

one effort to recover Guntoor from the Golconda sovereign, but was obliged to retire with an apology that sufficiently marks his imbecile character. Of the small degree of attention paid to his authority, we have the evidence of the European Missionaries of that period, who expressly state, that " the Naig of Madura was then at open war with him ;* his protection was however courted by the Missionaries, and he appears to have lent a favorable ear to them ; and induced by the solicitation of the merchants of his country, he seemed inclined to grant a settlement to our East India Company's factors, had not the Dutch, who had already established themselves at Pullicat, opposed it. In their correspondence they observe, that his death without male issue was expected to be followed (as in fact it was) by great troubles in the ensuing year."†

14. While these causes operated to retard the progress of the Mahomedan arms in this interval of 32 years, a few aspiring individuals laid the foundation of an intermediate order of things, which in the central districts occupied the place of the late government, and gave origin to a series of smaller states which gradually grew up and increased in power and territory, in proportion as by force or superior address, they could extort or wrest from the lesser usurpers their newly acquired possessions. In this incessant struggle, every artifice of a policy adapted to the circumstances of the times, and to the peculiar habits of these people,‡ was called forth into action, and exerted with a perseverance not unworthy of the struggles of a nobler cause.

15. In the more northern parts of the ancient Carnatic government, which had been abandoned in a manner of the ancient rulers as more exposed to the incursions of the Mahomedans, these usurpations more particularly are to be noticed, as being connected with the events

* See Purchas, Vol.——p.——.

† See Floris' Voyages in Ustley's Collection, Vol. IV, p.——.

‡ According to the native Memoirs, every chief of superior talents or good fortune is always praised for his address and knowledge in the Chatoor-Oopayem, or four modes or measures resorted to in the Hindoo diplomatique science; viz.

1 Sama.—Address, Negotiation, Policy.
2. Daana.—Presents, Gifts, Conciliatory Measures.
3. Bhedha Byctratagem; or " Ruse de Guerre."
4. Dundah.—Downright force, or the " ultima lex regum."

that subsequently led to their consolidation once more under one general government.

16. The Polligars of Chittledroog,* Raidroog, Harponelly, Tarakeira, Ruttinghery, &c. at this time acquired some strength and consideration, and seemed to promise jointly to oppose a formidable barrier to further Mahomedan encroachments, had not this hope been destroyed by their restlessness, and their perpetual contests for power and territory. To this period of confusion we may assign the origin of most of the Droogs† of the Carnatic. Most of these new chiefs were of the lower and hardier classes, the Baya or Beder, Gollar and Villallur, or the hunting, pastoral and agricultural tribes; these in their earlier accession to power exhibited traits of fortitude, hardihood, and a severity of manners, originating in the simplicity of their original modes of life that would have dignified their resistance to the northern invaders of their country, had they not been marked by excesses that quickly descended into savage, ferocious contests, feuds, and animosities among themselves, till their crimes at last paved the way for

* Historical Memoirs and Annals of various other Hindoo families originating in this period are collected, but not yet translated, which being wrote in their own language, and not intended for European eyes, convey their sentiments in forcible terms.—Raidroog, Mysore, &c. Memoirs.

† As Chitteldroog, Rutlingeery, Hosdroog, Paughur, Gardangeery, and a vast number of others in gradation form impregnable mountains provided with natural springs of water, to rocks of very inferior height, and proportioned to the condition or talents of the occupier, Kyfeyats of almost every one are preserved, wherein the circumstances that gave rise to their occupation at first, whether from "warning in a dream of the tutelar Deity of the place," or the "discovery of some sacred symbol," or to the conveniences of water and shelter to some bold leader with his savage band, are related with minute details, and the dates of their foundation are preserved with scrupulous care in the families originally appointed to keep these records; some of which have come into our hands, as Cancoopa, Chitteldroog, &c. To no country indeed can the description of the Poet be more appositely applied, for here it may be truly said that,

"Not a mountain rears its head unsung" in some Mahatuam, or Pooranum or ancient legend; for scarce a hill or rock whereon a cistern could be found but has been fortified with walls, sanctified by temples, and converted into the fastness of some hardy chief. The same causes give rise to the same order of things in all nations; and we here find the same age of castles and of petty fortresses which in Europe followed the dissolution of the Roman empire, in the period of anarchy that preceded the gradual forming of the modern (I had almost said, late) states of Europe, actually following in the South of India the dissolution of the Hindoo monarchy, and preceding the gradual renovation of one general government.

the final reduction of their country. The Bednore family also in this interval of universal confusion consolidated their territories along the Western Ghauts, and further extended their possessions from their first small establishment at Caladee, in the end of Ram Raaz's time, down to the coast of Honore, and afterwards to the limits of Malabar south; they resisted and opposed successfully the further advance of the Beejapoor forces along the sea coast, who in the meantime established themselves in the districts of Panch-mahl, lying between Goa and Honore, where their officers established their authority, and constructed forts (as is already related) to support their acquisitions, and further their designs on that side, and probably to keep Goa in check at the same time. The provincial administration of the Beejapoor government does not ever appear to have been carried further south than the limits of Honore; as the country from thence to the borders of Malabar was held by the native Rannees of Garsoppa, and other petty chiefs, till they fell under the power of the Bednore family.

17. For nearly 50 years, a clear connected series of historical events is yet wanting for the state of that side of the Carnatic dominion, and the only light is derived from an attentive comparison of isolated facts, detailed in series of Memoirs now collected.

A. D. 1645. Detailed materials wanting here for nearly 50 years.

18. The acquisition of the fort and island of Seringapatam by the Wuddier of Mysore is one of the most remarkable of the events, as the cessation of the ancient Rayel government above the Ghauts may be dated thenceforward, as well as the first permanent establishment of a new state that afterwards acquired considerable influence in the affairs of the Carnatic.

A. D. 1609. Seringapatam in this time acquired by the Skiddier family of Mysore.

19. A more detailed account of this family and state,* will explain this further, but of other causes that in the mean time impeded the Mahomedan progress in the south, and of their divisions among themselves, one instance occurs too remarkable to be passed

The progress of the Mahomedan conquest retarded by their own intestine divisions.

* This subject being taken up by a hand fully adequate to the subject, it might be unnecessary here to notice the Mysore transactions, were they not occasionally necessarily involved in a general view of the state of the Carnatic. Some anecdotes and facts connected with their history have also come to light since Colonel Wilks had collected his materials.

over; this was the temporary government established by the Abyssinian Mallik-Amber, who not only successfully resisted the progress of the Mogul arms, but laid the governments of Beejapoor and Golconda under contribution, and chose the foundation of a new state at Ghurkee, which afterwards became better known by the name of Aurungabad.

A. D. 1626. The death of his successor in 1626, put an end to this rising state in its infancy, which from the wisdom, moderation, and policy of this warrior and statesman, promised fair to introduce a more firm and temperate system of administration into the south, which appears to have been at this time in a state of the utmost distraction from the weakness of the several governments, the ill-judged ambition of their rulers,

And by the encroachment of the Moguls. and the encroachments of the Mogul armies, who now invaded the Deckan on three quarters.

20. The strong fort of Dowlatabad falling into their hands in 1634, a regular Mogul government was established in the

A. D. 1634. Fort of Dowlatabad reduced. Deckan, of which Burhanpoor at first was the capital; but as their conquests became gradually extended, the seat of government was afterwards removed to the more central

A. D. 1636. situation of Aurungabad, by the prince Aurungzebe, who seems first to have put every engine in motion to reduce the Patan governments of Beejapore and Golconda, as the leading steps to the universal domination of the peninsula.

21. But so short-sighted was the policy of these princes, that though the consequence of the Mogul conquests must

Mahomedan states of Deckan weakened by divisions. have been obvious, their time and their resources were consumed in futile discussions, or ill observed treaties, and their resources expended on vain projects or exhibitions of useless pageantry,* and in supporting an extravagant pomp

* The profusion of inestimable diamonds and other precious gems which adorned the state of the Golconda king, is detailed minutely by European writers, and it is from this exhibition that the celebrity of the mines of Golconda became so current in Europe in the 16th and 17th century, as to be used as a common-place topic and metaphor with our Poets in oriental similes.—See Havart for the vast riches of the Golconda monarch displayed in his dress on a visit to the European factories on the coast. See Valentyn also; both these works contain much information of the state of the country at that period, in connexion with their object of an account of the state of the Dutch establishments and commerce.

that ought to have been rather devoted to a general league for opposing the common enemy. Without possession of more authentic materials, it is only to some of these causes that can be attributed the joint partition and conquests of the Zemindars* of the Carnatic, (as they affect to call them,) which was planned and commenced precisely about this period by the joint forces of the rival states of Beejapoor and Golconda.

Now unite for their defence, and for the reduction and partition of the Carnatic.

22. On the occasion, it is said, that a mutual agreement† was entered into by the Golconda and Beejapoor governments, to avail themselves of the weakened state of the Carnatic to reduce the several petty chieftains, and to divide the country amongst them, each keeping possession of what they first got possession of, independent of other motives. It is handed down in Hindoo MSS. and traditions, that they were invited by several of the chiefs, by the weakness of the government, and by the eternal jars and feuds of the petty usurpers, Rajahs, Naiks and Poligars, who in this interval had seized the districts, and formed the country into several subordinate petty states, and reduced the remaining branches of the ancient royal family to an abject dependence on their capricious or venal support.

Invited by some of the Hindoo chiefs.

23. The Beejapoor chiefs having already established a regular government in the centre of the Carnatic, would find less difficulty in extending their possessions in that quarter, while the Golconda state naturally turned its views towards the South-Eastern quarter, and the sea coast, till at last they came in mutual collision. Our plan does not admit of a regular development of their progressive reduction of the several provinces, nor could it be well attempted here, from a deficiency

* A term rather applicable to the original system of the conquerors in their own country, than to the former, or the new state of these chiefs. For it is well known that those of Bednore and Mysore in particular, never acknowledged their power, and still resisted their authority.

† In consequence of this treaty, Gandicotta, Chunderghery, Chingleput and the country south to the Palar was overrun by the Golconda chief, Meer Jumla; and Gingee, Vellore, &c. reduced by Mustapha Cawn from Beejapoor, from 1646 to 1652, and were formed into provinces under officers dependent on Golconda and Beejapoor. This continued till the Mogul conquest in 1687, when they were annexed to the provinces of Carnatic, Balla Ghaut, or of Payen Ghaut.

of materials; a brief statement of the most striking facts sanctioned by evidence can be therefore only attempted.

24. The first invasion of the Beejapoor forces took place in 1636; at least we have written evidence that Ranadoolah Cawn this year appeared with an army before Cawleydroog in Bednore, (where Veeralruddra Naik had taken shelter,) having destroyed Ickairee, their original seat, and overrun the whole country from Bankapoor, Hurryhur, Busuapatam, Tarakeira, &c. In the next year we find him coming before Seringapatam,* whence he was repulsed, but he overrun the whole open country as far as the Cavery, and established the first regular Mahomedan government at Bangalore,† whence the Poligar was expelled to Maagry; and at Serah‡ which he made the capital of the province of *Beejapoor, Carnatic Balla Ghaat,* then formed for the first time.

A. D. 1636. Invasion of the Carnatic, Balla Ghaut by Beejapore.

A. D. 1638. Progress of Ranadoolah Cawn.

25. From information obtained at Serah, the establishment of the Beejapoor government there is assigned to the year 1644, which if correct, shews that this interval of eight years was taken up in various expeditions and reducing the several petty chiefs that had established themselves in provinces, districts, and even villages.§

A. D. 1644. A. S. 1566. Establishment of the new government of Serah.

26. Ranadoolah Cawn|| commanded the first army, and is stated to have remained in this country only two years. In this time, all the provincial forms of administration peculiar to the Beejapoor government were introduced. Serah was fortified, and made the capital of the *province of Carnatic,* with seven purgunnahs dependent, regulated by a complete revenue system, while the Poligars that submitted, were allowed to hold the less fertile tracts on paying a *condanee,* or tribute. *Zemindars,* garrisons,¶ and governors

In the Carnatic.

* Mysore, Callala, and Bednore Memoirs.

† Bangalore and Colar Memoirs. Also the Memoirs of the family of Maagree, now extinct.

‡ Serah Memoir, and Historical Account of the Nabobs of Serah.

§ Mudgerry Memoir, &c. &c.

|| Rana-Doolah, from Rana, (Sans.), field of battle, and Doolah, a bridegroom.

¶ Bangalore Memoir and Serah, where a list of the garrisons is given, and of the Poligars.

were placed in the forts, independent in some measure of the civil governors; and lands in jagheer were granted to the chief military officers, and to the killadars, who were obliged by the nature of their tenures, to maintain a certain number of troops ready for the service of the state. Thirteen fortresses are enumerated in the address which Ranadoolah sent on this occasion to the sovereign, requiring killadars and troops to be sent to garrison them; and we find that cazies* were at the same time sent from the presence to administer justice according to the maxims of the Mahomedan jurisprudence.

Ranadoolah leaves Shahjee as his successor.

27. Ranadoolah Cawn on his departure, committed the important charge of Soobadar of the province to Shahjee, a Marhatta officer, who appears to have been high in his estimation and confidence; a remarkable instance of this is stated in the Memoirs of Sheevajee, of the noble and extraordinary effort of the Mahomedan chief that saved the devoted Shahjee from the cruel punishment awarded by the intrigues of that weak court.

And the first Mahomedan government regulated by financial principles, on a system novel in the southern provinces.

28. It might be esteemed remarkable, that the first† Mahomedan government established in this important province should be committed to a Hindoo chief, did not the distinguishing traits of the system of administration that was adopted by the Turkish founders of Beejapoor explain, what is otherwise not very reconcilable to the general spirit of fanaticism that marked the first Mahomedan invaders, conscious of the difficulty of a body of isolated adventurers maintaining themselves in the midst of a foreign land, amidst millions possessing opinions and habits of life so very opposite to their own, and at constant variance with their brother states on the North and East. They seem to have early adopted a system evincing more libera-

* Colar Memoir, &c. Some of the sunnuds granted to these cazies still remain. Three copies are in the collection of grants.

† It might be deemed remarkable, that only three years previous to this date, the first grant of territory was issued to the English factory at Madras by the acknowledged sovereign of the Carnatic, the representative of the ancient legitimate Hindoo government, Sree Runga-Rayel, then residing at Chundragerry. The English government then is actually three years prior to any established Mahomedan government of the South.—See Translation of a Memoir, Appendix No. 1.

lity and political sagacity, than had hitherto marked the traces of these invaders.

Remarks on the Beejapoor Government, supported by a foreign militia and feudal tenure.

29. In the Turkish origin of this family; and the succession of adventurers they encouraged from Turkey, Arabia, and Persia, may be traced perhaps some of these distinguishing traits. The Timaryet system* seems to have been followed in their extensive jagheers to their munsubdars and chiefs, some of whom held very extensive tracts, (as Savanoor, Ankola, &c.); while the introduction of a body of foreign militia, the Hubshees, seem to have been borrowed from the Mamelukes and Janizaries, who in both cases were formed from slaves, or prisoners of war, purchased when young, and reared up in all the strictness of military subordination. We find accordingly, that the Hubshees furnished some of the ablest statesmen and warriors of the state; purchased when young, through the medium of the Arabian traders, they knew no other country than that which reared them; no other lord than him who cherished their youth. Educated about the court in the religion and in the accomplishments of the sovereign, they became attached to the prince from personal gratitude, from respect, and from the power of early habits; and in various instances, manifested a zeal and spirit of loyalty, highly honorable in their patrons and to themselves, and useful to their adopted country.

In the political economy of that government, the Brahmins chiefly employed.

30. Not in this instance alone was the policy of the Bejapoor state conspicuous, a superior knowledge of political finance seems also to have distinguished its genera administration. Their institutions for regulating the country breathed a spirit moderate and mild, and well adapted to cherish agriculture, nor was commerce neglected; and they very sagaciously availed themselves of the acute and subtle genius of that class† of their native subjects, which is so well accommodated to the arrangements of finance and of political economy. The

* This suggestion is mentioned not without considerable hesitation; and without clearer information on the subject, it might be presumptuous to offer it, any further than as a conjecture founded on concurring resemblance.

† In Ferishta's Deckan, Vol. I, p. — is a remarkable instance of the inconvenience to which these native financiers were exposed, through the suspicions of the less enlightened and ambitious nobles of Beejapoor.

secular Brahmins were therefore employed with advantage in these situations, which the first rude warriors could ill manage.* In Ankola, in Sanoor, in Serah, the vestiges of this system still prevail, and wherever their armies moved, they appear to have been accompanied by these able accountants, (the Dessayets.) In Bangalore and Colar, we therefore find this system still (or recently) prevailing under all its several ramifications, while the provincial system of the Raya Samastan prevails in all the districts that had not been organized as settled provinces, but left under the payment of a tribute in their interior arrangements to the rule of the native chiefs.†

Reflections on the character of Shahjee.

31. The choice of Shahjee under such a government, may be therefore attributed to a superior degree of political sagacity; and we accordingly find, that the establishment of the new system of management is attributed to him, who was destined to be still more distinguished afterwards as the founder of a dynasty and power, that in about 120 years was to extend its influence nearly over all India, and gave the first serious check to the progressive growth of the Mahomedan power, till the discomfiture of the Marhattas at Paniput in 1761.

32. In the Bangalore, Serah and Colar districts, this arrangement of revenue management lately prevailed, as described in an authentic Memoir, preserved by one of the descendants of the first accountants, where, after describing the arrangement of purgunnahs by Shahjee, he proceeds:—‡

* Hence the countries subject to the new families of Bednore, Mysore, Chittledroog, Raidroog, &c., whose chiefs are registered as zemindars, were found to be managed according to the ancient system, while Bangalore, Colar and Serah, as organized provinces, were registered by this new system, managed by the Dessayet Brahmins.

† The Raidroog MS. saved by accident, clearly shews this as well as the Bednore, &c. Memoirs. This book states the original revenues of their country, and the mode by which the demands of the contending powers were assessed as an extraordinary (*a*) contribution on the ryuts, in proportion to the original rent.

‡ Literal translation from a Memoir, furnished by one of the descendants of these Dessayet Brahmin officers in the Colar district.—(Mar.)

(*a*) These extraordinary contributions appear also to have been practised in the more ancient provinces of the Southern Dravida countries, under the name of *dund*. This last chiefs of Inscriptions contain information of the taxes and customs levied on the subjects by the ancient government.

33. "Having formed these seven purgunnahs, he arranged the subordinate divisions of samoots, taruffs, mowza and mazara of each purgunnah, and appointed Jemmadars. In the time of the Rayels, the accountants had what we called Sumpratees, but the Marhattas introduced the different offices of

Notice of the system of managenent introduced by him into the Carnatic.

1. Deshpondee,
2. Coolkurnee,
3. Sirnaad-Goud,
4. Deshmook,
5. Canoongo, &c.

and the accounts of the countries were kept by them. He also appointed serishtadars to all the purgunnahs. When jagheers were granted to the killadars and munsubdars by the Circar, the revenue account of the district for the last years was previously examined, and the new revenue rated annually on the jagheer to be granted."

34. "In fixing the revenue thus established, the enams, or free gift lands, land customs, &c. were discontinued or deducted, and the net revenue more or less than the former, ascertained by the means of Zemindars."*

35. The Deish Coolkurneeka was to write the cowl-puttah, (contract or lease† for the revenue,) and the Deishponda was to sign it in Marhatta characters at the bottom of the paper. The Deishmook, Deishponda, Canoongo, and Sirnaad-Goud were also to add their signatures to the written deed, and the Emuldar finally to seal it.

A.D. 1644. A. S. 1566.

36. These regulations were introduced by the Marhattas, whose forms are still used; but it should be carefully recollected, that this regular system of revenue be not confounded with the irregular contributions

* What were these Zemindars? Were they officers of government, or did any offices of the same description exist among the Hindoo governments previously? I should suppose the Naad-Gouds and Gram-Gouds were officers appointed by government, but hereditary, and equivalent to the officers now introduced by Shahjee. The Naat-Prabhoos of the ancient government was lord of the district, the very term used in the institutes of Manoo, "Lords of villages of 10,000 and 1000" are actually used in grants of the fifteenth century, remaining on several stokes at Calasa, where Bhyrasa Vadeyar is denominated "Lord of 1000 villages."

† Here we find the first notice of a lease, and there is reason to think no lease was issued under the Southern Hindoo management.—(Potta.)

levied by the Marhatta armies in the Carnatic within a few years afterwards, when under the memorable denomination of choute,* (which was only introduced at the end of Aurungzebe's reign,) they laid the whole Deckan under contribution.

Evidence existing in the Eastern districts thereof.

37. Several grants and sunnuds† of Shahjee and his successors down to 1686, still preserved in the districts of Bangalore and Colar, place beyond a possibility of doubt the existence of this government, which till very recently, appeared to have been unknown to Europeans. The forms of management by Zemindars, Deishpondas, &c. existed till lately, and the descendants of the original Dessayets are still spread over the country, and employed in various branches of our own administration.

38. The financial administration of the Beejapoor Mahomedan government was thus early committed to the direction of that class of Hindoo Brahmins, denominated in this country Dessayet, Nizam Shahee, or Marhatta‡ Brahmins, and to whose hands the custody of all public records and accounts have been, with little variation, since continued; particularly in Balla Ghaut, by the different Mahomedan successions, till they were transferred with the exercise of sovereign authority to the English government. In the lower country, where the Golconda government preceded the Mogul, the management was chiefly committed to another class of Brahmins provincially distinguished ;§ but as the mode of administration peculiar to the Southern provinces demands a previous knowledge of the history|| of the earlier period, and more ample accounts of these districts, that subject may be passed over now to resume the progress of the Mahomedan conquests.

* See notice of the origin of the choute in the Bednore or Calladee Family History.

† List of twenty-six sunnuds preserved in the Bangalore Colar &c. districts, to the grant of Eckojee in A. D. 1670, copies (and even facsimiles of some of them,) are taken to authenticate the existence and nature of the government then established in the Upper Carnatic.

‡ Serah, Pennaconda, and Bangalore Memoirs.

§ Neyogee or *employed*, or secular, in contradistinction to the *Vidwamsas*, or theologian Brahmins.

|| A considerable collection of ancient Grants from all parts of the Tamul countries is in progress, and translations of several of them seem to throw a very clear and decided light on this subject.

39. The Beejapoor generals having reduced or expelled most of the petty Polligars, as Tavar Kaira, Bangalore, Ruttingury, &c. they seem now to have been prevented from wholly reducing the remaining Hindoo chiefs, by their own intestine wars at home, their contentions with the states of Golconda and of Ahmednuggur, and from the necessity of watching the progressive movements of the Moguls from the North.

A. D. 1644. A. S. 1566.

40. Shahjee was recalled* within a very few years to Beejapoor, in consequence, as it is said, of the disturbances raised by his son Sevajee in the district of Poonah, who having seized upon several of the forts of the Concan, it was imagined that the influence of the father might have been successfully exerted to bring the son to a due sense of his duty to the state. Doubtful probably of the result, or desirous (as the first wish of a Hindoo) to provide for his family, it is stated that previous to his departure for the capital, he made an arrangement of the Southern provinces, and divided them among the children he had by another consort; his favorite residence had been confined to Bangalore and Colar, the former (Bangalore) he bestowed on Eckojee, the founder of the Tanjore family, and Colar, Hoscotta, &c. on four of his other children and his chief minister. The evidence of the grants† of this chief and his successors remaining in these districts, sufficiently prove the existence of this continuation of their government, in which it is remarkable that no notice is taken of the superior government and of the sovereign, agreeable to Hindoo form.

Shahjee recalled to Beejapoor.

Leaves his family in the government of the Eastern districts.

And confers considerable jagheers on his dependents at his departure.

41. This subordinate government under these Marhatta families existed for 48 years in these districts; and until Cassim Cawn was sent by Aurungzebe to prosecute his successes to the Southward, who deprived the progeny of Shahjee

Which they governed for 48 years.

* Memoirs of Sevajee of Tanjore, &c. &c. which united, fully illustrate that part of the history of the times.

† Copies of some of these grants were sent to Poona in 1807, but no information could be obtained there on the subject, and the meaning of the previous formula was not known.—See Bangalore Grants in collection of Sassanums; they begin with three of Shahjee's, 1642 to 1650, and end with one of Eckojee's, 1670, and one of his Dewan's in 1681.

of their possessions, and annexed them to the immediate jurisdiction of the khalsa (or exchequer,) as a dependency on the newly-formed soobah of Beejapoor, under the name of Beejapoor Carnatic.

Progress of Golconda in reducing the Eastern dependencies of the Carnatic.

42. While the government of Beejapoor was gradually reducing the upper provinces of the ancient Carnatic, the state of Golconda had extended its acquisitions in equal progress in the NE. and SE. quarters.

A. D. 1646. A. S. 1568.

43. Of the progress of the Golconda government in acquiring their share of the spoils of the Carnatic, we have yet obtained by few connected accounts. In pursuance of agreement with Beejapoor, they would appear to have about the same time also sent an army into the Eastern Carnatic adjacent to the territory of Guntoor,*

Guntoor, Cuddapa, Chundrageery, Chingleput, Poonamalli, &c.

and reduced the whole tracts lying along the coast, and thence extended their conquests above the Ghauts, including Cummum, Cudappa and Gooty; these were then still nominally dependent on the Rayel at Chundrageery;† but in fact at this time in the hands of various petty chiefs who had usurped all the authority of government under different titles. The chief places and forts appear to have fallen successively, but the materials yet obtained, afford no regular detail of the operations. The famous Meer Jumla, who afterwards revolted to Aurungzebe, and was so instrumental to his success in ascending the throne, was the principal general employed by the king of Golconda on the service; and it is said on this occasion, he‡ enriched himself enormously by wealth acquired in the conquest.

Gingee falls to Beejapoor.

44. Gingee, the strong fortress of that name, was reduced by Mustapha Cawn,§ and that family descended from one of the ancient established nobility of Beejanuggur,

* Guntoor or Condaver, was reduced to the government of Sultan Abdulla-Cootub Shah, A. D. 1646.—Condaver Annals, p. 28. It is to be observed that it was conquered by Golconda in 1580, but after 36 years' possession, it was recovered and lost twice by the Hindoos, till its final reduction this year.

† Chundrageery fell A. D. 1646.—Sree Permadoor Memoir.

‡ Particularly from the Diamond-mines, where one remarkable gem is recorded as an object of imperial avarice and avidity.

§ Mustapha Cawn was probably one of the Beejapoor generals, when Sevajee made his memorable irruption into the Carnatic. He appears to have considered Gingee as a

was extirpated. Tripassoor, Chingleput and Chundrageery, the capitals of the nominal Rayel, were at last taken, but under what circumstances we do not learn, whether by negotiation or by siege; but it is reported that the Golconda forces were invited by the Naig of Tripassoor, and that the last, Sree Runga Rayel, fled to the Bednore chief for aid. This is confirmed by the records of that family, which mentions, that Sewapa Naik actually put an army in motion thirteen years afterwards, to restore the ancient Rayel Samstan,* and as a preparatory measure, advanced to Seringapatam, with a view of taking that stronghold. Whether he was serious in wishing to restore a government that might afterwards resume the newly-acquired power of his own family, or only designed to weaken the rival power of Mysore under the authority of a nominal sovereign, (a practice not unknown among the Hindoos,) does not clearly appear; nor what became of the existed prince after this unsuccessful attempt.

Golconda acquisitions extended to the Palar.

45. Thus the whole Eastern districts appear by degrees to have come under the Golconda government as far as the river Palar, which was the limit where these conquests came in contact with the Beejapoor conquests, soon after seized upon the Marhatta chief Eckojee. This province† came afterwards to be distinguished in the registers by the name of *Hydrabadee Payen Ghaut*, while their upper conquests were denominated *Hydrabadee Balla Ghaut.*

Origin of the Hydrabadee Payen Ghaut.

Nature of the government established by Golconda.

46. The military command was as usual placed in Mussulman havildars,‡ &c., while the financial administration was committed to the class of Brahmins distinguished still by the name of *Golconda Neyogee*, (or employed.) The system of

dependency of Beejapoor, and therefore claimed it from his brother Eckojee, as part of his father's acquisitions. The account of the contentions between the brothers on this occasion is curious, and illustrative of the character of the parties and manners of the times. Vellore, a part of these acquisitions, was surrendered to the Marhattas A. D. — and to Sevajee A. D. 1677.—Madras Records.

* Sree Permadoor Account, obtained from one of the Religious Stallums, and in its dates appearing to be sufficiently authentic.

† The province of Gingee extended to the sea-coast, and from the Palar to the Coleroon South; Tanjore lay beyond the Coleroon. For the reduction of these countries by the Marhattas, see Memoirs of Sevajee and of Tanjore, Appendix No. 2, 3, 4, 5, &c.

‡ Havildar. This is the designation of their office in Havart's Floris and other Travellers of these times, and the Madras Records.

Podellee Lingapa,* then said to be established by a Brahmin of that name, is still known in our own system of management. Thus the Carnatic on either side came in its revenues to be administered by two different classes of foreign Brahmins, *Marhatta* and *Tellinga*, acting under the authority of a double Mahomedan government, whose forms and documents then introduced are still erroneously recurred to, as standards of the ancient system of financial administration† in the Carnatic.

47. The Beejapoor generals on the either side, from their capitals of Serah, &c., appear to have reduced the country North of Ghooty, with the Polligars dependent on it; and then extended their dominions
A. D 1652. into the vale of Canoul and the Circar of Nundial; and finally concluded the treaty of Penaconda in some haste, probably to prevent its falling into the hands of their Golconda allies and rivals; for, notwithstanding their apparent amity, which necessity only caused, the utmost jealousy and rivalry at times appeared, heightened by the animosities produced by opposite religious opinions of different sects.‡

48. The ablest of the Golconda generals rebelling in the mean time, the prince Aurungzebe readily availed himself of this favorable circumstance, and gave extraordinary encouragement to Meer Jumla; not so much influenced by his acknowledged talents perhaps as by the deep designs of that artful statesman on the imperial throne, and the future subjugation of the whole peninsula.

49. Such was the state of the times when a Native author§ con-

* This Brahmin in 1677 is stated in the Records to have been "then Governor for Golconda of all the country extending from Armigam, South to the Beejapoor possessions," comprehending in fact the ancient province of *Tanda-mundalum*, or what in latter times became the jagheer of the Company.

† It will be recollected, that this generally refers to the provinces South of the Toombuddra, or the Carnatic, the proper subject of this paper; while in Hindostan, the institutions of the Patan and Mogul emperors had been so long established as 7 or 8 centuries; and in Bengal for 200 years.—See Grant's Enquiry.

‡ The sects of Soonee and Sheya divide the Mahomedans of India. The Golconda chiefs were generally of the latter, holding Ali in great reverence.

§ This little tract containing the most authentic account of the Southern kings from the 13th century, was apparently written about the year 1646, the very year in which the Mahomedans expelled the last of the Rayels from Chundergeery, and was probably meant to excite the hopes of a deliverer of the Hindoos, and to revive their drooping spirits.—Gutpurtee MS.

cluding a chronological, but succinct list of their ancient kings, conveyed under the disguise of a prophecy, denouncing the evils that were to ensue, after declaring that the country shall then fall unto great disorder, and prodigies and omens shall appear. The goddess Callee shall appear in the world in all her wrathful form. The proprietors, occupiers, nobles, inhabitants and all the children of the South shall perish, mankind shall be in strife and war, the demons every where exciting to strife and arms in every town and in every street. The Munnovars (the great nobles,) shall be obliged to obey the command of Mussulmans, and be like sheep led to the slaughter, concludes with a prophetic annunciation* of a deliverer and conqueror to come, who should relieve the natives from their distress and oppression. Then the divine Veera Vasunta shall appear, young women and virgins shall announce his approach with songs of joy, and the skies shall shower down flowers, &c. These prophecies undoubtedly had the effect that was designed, of stimulating resistance to the weaker administrations of the Deckan, and exciting hopes of a conqueror and deliverer of their own nation; but relief was not yet destined to come through the means of a Hindoo. To elucidate the causes and progress of the approaching change of government; to explain the pretensions of the several competitors, and the actual state of the two expiring Mahomedan governments that were now about to be absorbed in the prevailing fortune of the Moguls, it may be satisfactory to trace back the chain of events that preceded the furthest extension of that empire.

* This resemblance to other well known prophecies of other nations and times is striking; in fact they have been made use of in all nations to stir up the populace, and nowhere oftener or with greater effect than in India, where the doctrine of the Metempsychosis particularly favors these opinions that are industriously propagated by the class of Jungums. We have had very recent instances of the use to which they are converted. Copies of several of these pretended prophecies circulated by these people, some so late as 1805, are translated.

II.

50. The first Mahomedan conquerors of the Deckan, it will be recollected, were Patans, led on by the redoubted Allah, who after a series of cruelties and rapacities that make the Mussulman name still an object of horror,* finally reduced the provinces South of the Godavery into the form of a province, denominated from its relative position to Delhi, the Deckan, or Dutchen (or South,) though erroneously, as the word is properly applicable, and understood by the ancient Hindoo geographers† to comprehend the whole of the South of India, or Dutchen, in contra-distinction to Hindostan, the country North of the Nerbudda.

Retrospective view of the progress of the Mahomedan invasions of Deckan, of the Patans and Moguls. A. D. 1293.

51. It is not the intention here to detail the events by which their power was finally‡ established in the central parts, while they were forced to leave very soon the Southern provinces of Dravida and of Carnatic, &c. to the natives under a new dynasty of princes, who (from Memoirs now more clearly developed,) appear to have been actually about that period only established.§ The bold and ill-concerted measures of the succeeding Emperor, Mahomed III, and the attempt to remove the seat of imperial government to the centre at

Carnatic first conquered. A. D. 1324. A. D. 1326. Beejanuggur founded, and a new Hindoo dynasty established. A. D. 1344. Resolution of the Patan chiefs of Deckan, and a new state formed at Culburga. A. D. 1338.

* The kine-slaying Turkalloo, are emphatically mentioned in one of the ancient Kalla Canara Inscriptions at Basaral, dated A. D. 1135, or A. S. 1057.

† As given in their several Boogolums, or geographical descriptions of the Hindoo world. The Dutchen of the Hindoos comprehends the peninsula stretching South of the Nerbudda and Maha-nuddi, and is the *Dachen-abads* of the Periplus, which signifies the *countries lying to the South.*

‡ Waruncull was taken in A. D. 1324, (Daw,) the MS. account of its dynasty agrees in the most material facts.

§ Beejanuggur, the capital of the new kingdom, was then only established, though Ferishta asserts they had existed 700 years before, confounding it with the ancient capital and kingdom of Callian, of which Beejal Roy had been King. Door-Samooder, (the capital of the Carnatic at this time,) was taken in A. D. 1326, Daw, vol. — p. — which is confirmed by inscriptions. Campila also which appears to have been then a capital of some consequence, situated not far from Beejanuggur, was taken at the same time. The history of this kingdom is still obscure, but might probably be explained by a translation of the life of Campila Rajah, a MS. in our possession.

Dowlatabad, the rebellion of the Mahomedan chiefs of Deckan, and the dissatisfaction of the nobles; with the revolution by which the new Mahomedan state of Deckan was formed under the Sultans of Culburga and Beder, are now well known to Europeans; but the cause of the cessation of their inroads, by which for 364* years, the Southern Hindoos were left to themselves to form new states and new governments, is not so clearly understood perhaps, nor that with considerable success they repelled the forces and repeated efforts of these warlike enthusiastic Northern nations. One of the chief causes proceeded from the new Mahomedan states early splitting into four or five different principalities, who were constantly engaged in hostilities with each other, till religious zeal on their side, and imprudent arrogance on that of Ram Raj, brought on the last war that terminated in the subversion of the Hindoo monarchy; otherwise there is sufficient evidence to think, that some of them (the Adil-Shaha and Dowlatabad chiefs) would have rather supported the Hindoo state as a check to their rivals, had they not been goaded on by religious prejudices.

Weakened by intestine divisions and four governments formed by the Patans.

52. Exclusive of the revolt of Deckan chiefs about this period, the Northern hordes appear to have approached the limits of Hindostan, and we find them harassing the empire, by turns defeated or bribed from 1295 till 1326; when their leader, Seri, of a tribe named Zagatai, then entirely new to Hindoos, was induced by a sum almost "*the price of the empire*" to retire, an act of improvidence, which joined to their growing confidence in their numbers, stimulated by exaggerated ideas of the wealth of India, or rather of the Deckan, (for in fact from Jellingana, Waruncull and the Carnatic, were supplied those immense† sums that could be only reck-

The Northern tribes of Moguls appear on the frontiers of Hindostan

A. D. 1295.
,, 1303.
,, 1305.
,, 1326.

* From 1300 to 1664.

† It is difficult at first to conceive whence this wealth could come, but when it is recollected that considerable quantities of gold have been worked throughout the Peninsula, added to what might be imported by an early commerce with the Eastward, and reflecting that the constant accumulation of ages had never before been wasted by foreign invasion or expedition, some credit may be given to the quantities said by the Mahomedan writers to be carried off by Allah. It is to be observed that silver was then little known in the Peninsula, and as a coin, is never mentioned in any ancient Records or Grants.

oned by weight.) These tribes uniting in greater force, at last under a descendant of the great Timur established themselves on this side of the Indus, and in the government of Delhi in 1498 under the celebrated Baber, the founder of the Mogul dynasty in India. This happened precisely three years after Vasco De Gama's arrival in India; the Moguls then appearing on the North, while the Europeans first arrived by sea in the South.

And ultimately establish the Mogul government in India. A. D. 1498.

53. The progress of the Mogul conquests to the South thenceforward, though slow, was unremitted,* till at last Akbar having subdued the Patans, from that time the Emperors of Delhi turned their views entirely to the South, and at the period we are now come to, after taking Doulatabad in 1634, and reducing the whole country to the Godavery into the form of a province, the capital of their Southern conquests was established under the province Allum Ghur, at a favorable situation not far from the ancient Hindoo capital of Deogheer, near the village of Kurkee, where the seat of government was now established by the name of Aurungabad.†

Who extend their conquests to the South. A. D. 1364. A. D. 1654.

54. The encroaching power of the Moguls from this time forward considerably weakened the Southern confederacy, and now under an ambitious and enterprizing young prince, seriously threatened their existence as independent states; of the secret views in con-

And establish a vice-royalty in Deckan, where Aurungzebe contemplates the conquest of the whole Peninsula.

* In this interval it was that several Mahomedan Missionaries, some of them women, from motives of zeal for propagating Islamism, and agreeable to that fanatic spirit that animated the first followers of Mahomed, came into the Deckan or South of India, forming establishments, and planted the seeds of the faith in the heart of the countries still retained by the *infidels*, as they denominated the Hindoos. The Durgahs of the Owliah at Kurkee, now Aurungabad, and several along the Western Ghauts of Deckan and of Seraje-ud-deen at Culburga, and further South; the Durgahs at Pennaconda near Colar, Secander Mulla perhaps that of Trichinoply, and in different other places were established previous to the Mogul invasion of the Deckan, and equally proving the unremitting zeal of the Moslem Missionaries, as of the inoffensive, unresisting spirit of the Hindoos, who under their own independent Pricees, admitted these fanatic usurpers in some places even to occupy their own temples of religion. Curious anecdotes of this spirit appear in the Kerala Ulpati, or History of the Establishment of Malliallum, in the History of Poona, and in the Memoir of Pennaconda.

† The walls of the city or sharpenna, were, however, only completed in A. D. 1683, on the Emperor's return to Deckan the second time. See Hakeekul, Part III, under that year.

templation of this prince of reducing the Mahomedan provinces of Deckan, there exists an evident proof in one of his letters to his father Shah Jehan, wherein he states, that the representative of the Anagoondy family had actually proffered to become Mussulman to obtain his aid in recovering the ancient dominions of his family from the powers of Golconda and Beejapoor, and thence recommends his case to the royal presence, though it is hardly possible to give unlimited credit to a proposition so repugnant to the feelings of a Hindoo Rajah. We may yet believe it might be suggested from political motives, and can however infer, that every encouragment was given to detach the Hindoo chiefs from the Deckan confederacy.

III.

55. It was probably in consequence of these views, and to strengthen their resources by the total subjugation of the lesser Hindoo states in their rear, that the two courts of Beejapoor and Golconda are stated about that time to have arranged that plan of partition of the Carnatic already mentioned, by which either of them were instantly to take possession of the smaller states that were near it, and to retain what they respectively got possession of. We have seen the extent of this plan taking effect in the reduction of the Upper Carnatic as far as the Cavery, by (*candenee*) tribute, or by (*candauem*) established rent, and of the sea coast of Coromandel as far as the Coleroon; but Travancore, Malabar and the lower provinces beyond the Coleroon, scarcely appear to have been visited by a Mahomedan army, from the first invasion of the Patans in the 13th century until the period we now approach.

Weak conduct of the two governments of Deckan.

They agree on a partition of the Carnatic.

And put it in execution.

56. Aurungzebe having marched* into Hindostan to support his views to the throne; and having carried with him the most select officers and troops of his province, and the celebrated Meer Jumlah among them, the chiefs and provinces of the Deckan were left once more to themselves, as the Imperialists acted on the defensive during his absence.

A. D. 1656.

But on Aurungzebe's return to Hindostan, lose the opportunity of strengthening themselves.

* See Vansittart's Account of Aurungzebe, p. 2, and the Hakeekut, Part iii, under this year.

57. In this interval, they might have strengthened themselves had their conduct been directed by the common maxims of policy or prudence; but both these states of Golconda and Beejapoor were now fast verging to their decline. At Beejapoor, towards the end of Secunder Adil Shah's reign, and under the weak minority that succeeded, the court was disturbed, and every measure perplexed by the intrigues of eunuchs and of women, and by the feuds of the nobles, who having acquired too great a preponderance of power, by their factions and arrogance, became fully prepared to receive the yoke of a conqueror; while at Golconda, the sovereign sunk in the extreme of sensual pleasure, or absorbed in the flights of fanatic devotion, abandoned the helm of state to his ministers, who being Hindoos and Brahmins, are supposed to have secretly encouraged the plans of Sheevajee, and instigated the vain resistance to the increasing demands of the Emperor, that could only be* satisfied ultimately by the entire reduction of Golconda to the state of a province.

Weakness of the states of Beejapoor and Golconda.

58. Aurungzebe having by superior policy or stratagem, overcame his brothers, and confined his father, ascended the imperial throne in the year following, and soon after sent his brother-in-law, Chaista Khan, the chief of the Omrahs,† as subadar of the Deckan, in place of his son Mahomed Mauzim, who was recalled.

Aurungzebe ascends the throne. A. D. 1657.

59. It is possible that this choice was influenced by the necessity of sending some experienced officer to check the rising disorders in Deckan, where a new genius at once starting up, seemed to throw obstacles in the way of the emperor's design of the universal reduction of the South, and threatened to wrest that prey from his talons on which he had long prepared to pounce. It is also said, he was provoked by personal motives of wounded pride against this new rival of his power, the Marhatta Seevajee, who, in the

Sends his generals to check the disorders in Deckan.

* In the Dutch work of Havart, Vol. ii, Chap. 2d, a full detail is given of the state of that court in 1686, immediately previous to the conquest, and of the character of the King and his ministers.—This work appears to have been unknown to Orme when he published his Historical Fragments of the Mogul Empire in 1782. It is barely quoted in the notes of the late edition.

† The recall of Mahomed Mauzim and the mission of Chaista Khan-Ameerul Omrah is mentioned by Vansittart under this year, p. 25.

short space of three years had not only wrested the Concan and the numerous hill forts of the Ghaats, from the government of Beejapoor, but had even dared to intrude on the contributions and territories of the settled Mogul provinces. (Mamalik Maroosa.)

60. It is not necessary here to enter into the events that crowd upon the attention in this remarkable period; nor the cause of these successes, which encouraged an obscure adventurer, a young man, assisted by none of the usual advantages of royal birth, or high pretensions from military experience, to contend at first successfully with the armies of experienced warriors formed by the wars of the Deckan, and ultimately with the more redoubted armies of Hindostan, flushed with their late conquests and victories in the contentions for the crown.

Where Seevajee stirs up the Marhattas for the first time

61. It should not however escape observation, that much of his success was owing to the popularity of his cause, and we may suppose that the Hindoos, in this enterprizing young chief believed they saw one of those heaven-inspired heroes that they were told was to appear, to deliver them from foreign oppression and thraldom, the rigorous edicts of the Emperor also in regard to their religion, whereby a poll tax, (the Jessyah,) was laid on every Hindoo, doubtless encouraged these ideas of resistance; ideas which Seevajee by every pretension of the favor of heaven, communicated by celestial visions,* sedulously endeavored to keep up. His negotiations with the Imperialists, his journey to

Reflections on the causes of Seevajee's extraordinary success.

The rigor of the Emperor to the Hindoos; their hopes of a national deliverer.

And his enterprizing character.
A. D. 1672.
A. S. 1594.

* There seems no reason to doubt but that Sevajee himself and his adherents countenanced the idea of his being under the immediate protection of a guardian deity, whose votary he professed himself to be, and by whose inspiration he pretended to be directed; and the Hindoos were willing enough to believe it, as we see by the frequent annunciation of the appearance of Veera-Bhoga upon earth, repeated from 1646 down to 1805. In the Marhatta Memoirs of Sevajee, it is stated, that when in the Carnatic, "after the capture of Chendee Killa, he (Sevajee) had an interview with Eckojee raja. He took the fort of Ottoor—Then in shuck 1595 (A. D. 1673,) in the year Pramadicha on the 13th Cheytor-bahool, decreasing moon of April,) on Monday, Shree Bhuwanee (the divinity in a female form) came and remained 5 ghutkas (or hours) in the person of the lord and master, (Seevajee,) and spoke of things to come. She spoke to the following effect: "Then a prophetical promise of universal conquest as far as Caasee is held out, to remain in the Bhonsla family for 27 generations in the presence of————————who took it down in writing." It is probable this prophecy was fabricated for a particular purpose long after, but we see the ambitious views that at one period stimulated the ambition of the Marhatta nation, in this instance too plainly to be misunderstood.

Delhi, his stratagem and escape, his extraordinary enterprizes against the Beejapoor chiefs, and his success afterwards, form a series of adventures scarcely to be paralleled in Flebustur* history; and within seventeen years, we find him in consequence of a treaty with the Hindoo minister of Golconda, joined against both the Mogul invaders and their Beejapoor fellow-sufferers, agreeable to that unsteady policy which seemed to prognosticate the speedy fall of both these kingdoms, permitted to pass by a circuitous route by Golconda† and the Eastern mountains, through the Balla Ghaut, into the lower country of Carnatic, by Tripetty, within thirty miles of Madras, to take possession of the strong forts of Gingee and Vellore, which only a few years before, as is already mentioned, had been captured by the Beejapoor generals.

A. D. 1677. In his conferences with Madana, supposed to have been encouraged on his daring visit to Golconda and to the sudden circuitous irruption into the Lower Carnatic.

62. Of this design and plans, evidence exists in the records of Madras, where the factory then but newly established, and garrisoned by two companies of mixed troops, were in much alarm for his designs, and endeavored to propitiate his good-will by presents suitable to his taste‡ and to their situation at the moment. His request of engineers and ordnance from the Europeans of Madras confirm the anecdotes related in his life, of his ideas of the advantage of strongholds and fortifications to a new formed state, and we find this curious illustration of character well contrasted with the little skill exhibited by the Mogul generals in attacking the wretched fortresses of these times; a fact sufficiently established in the long protracted sieges of Chagna, Golconda, Gingee, and Waken Kaira, some of which lasted ten years, and tended to spin

His expedition against Gingee. Traits of character evinced in his requisitions from Madras.

Contrasted with the unskilful operations of the Imperialists.

* In his earlier adventures, there is a striking resemblance to the mild enterprizes of the Buccaneers, or Flebusturs.

† Havart mentions his visit to Golconda, A. D. 1676, Vol. — p. — and the alarm it occasioned at that effeminate court.

‡ In May 1677, he came within 2½ coss of Madras, (Mad. Records.) A curious account is given in the Marhatta Memoirs, wherein his route is described, and of his excursion from the banks of the Kistna into the wilds of Purwuttum, where in a fit of frantic devotion, he was about to relinquish all his ambitious projects, and was with difficulty withdrawn by his confidential friends. He appears at times to have been subject to fits of remorse, and the wilds of Purwuttum are certainly well calculated to inspire the most gloomy ideas.

out a destructive warfare of twenty-five years, of whose effects the South has not yet entirely recovered.

63. On this expedition, it is said, he attempted to wrest Tanjore from his brother Eckojee; though some uncertainty hangs over it, if it be at all true, as Eckojee is stated to have only got possession of Tanjore in 1675; and Sevajee returned to his own country in October* 1677, so that he only passed one year in the Carnatic, however employed. But by this expedition (by late and authentic materials,) he is stated to have acquired countries yielding a revenue of fifty lacs of hoons, dependent on the strong fortresses of Gingee, Vellore,† Colar, &c.

Demands half of his father's estate from Eckojee of Tanjore.

64. The generals of the imperial troops had been repeatedly changed in Deckan by the emperor's order, who though so far distant as Cabul, yet could have notice in fourteen days of every interesting transaction; no less than five of these officers had been changed within the last eighteen years, from‡ 1657 to 1675, when Khan, who was then the general, undertook the siege of Beejapoor with the collected forces of the South, and a serious engagement ensued on the Beema. Though many of the discontented nobles had fled to different quarters, the general Abdul Kerrim made a gallant resistance, and the action was not decisive.

The Imperial generals in Deckan frequently changed.

The emperor directs the war at a distance. Hostilities renewed against Beejapoor.

65. In this first campaign, Beejapoor was assisted by the Hindoo minister of Golconda, who seemed then at last to have felt the common danger. Among the auxiliaries on the side of the Imperialists, was Islam Khan Rhoomee, the fugitive Basha of Bussora, with a body of Toorks; vast numbers of Rajapoots also served in the emperor's army under their chiefs. A second engagement ensued scarcely more decisive, but the imperial general found means to bring over many of the dis-

Which now is aided by Golconda.

Succeses of the Imperialists.

* Tanjore Memoirs. Anquetille du Perron's Recherches Historique.

† Madras Records and Memoir of Sevajee.

‡ In 1657, Sultan Mahomed Mazim.

,, 1659, Chaista Khan.

,, 1664, Mirza Raja Jey Sing.

,, 1666, Sultan Mahomed Mazim, a second time.

,, 1671, Maharaja Jeswunt Sing, Mohabut Khan, } Deputies.

,, 1675, Khan Jehan.

affected fugitive chiefs of the Golconda army, and finally effected a truce with Abdul Kerrim Khan, by which a resident was received at Beejapoor; and that general appears to have undertaken soon after to bring Hydrabad into the imperial possession.* In this interval Culburga and Nuldroog were both surprized, and Abdul Kerrim engaged in an intrigue to displace Khan Jehan, the imperial general.

66. That officer being in consequence recalled to court, Dillere Khan was appointed to conduct the war, and the armies marched against Hydrabad; but were forced to fall back by the firmness of the Deckan nobles of Beejapoor, who on one occasion are stated to have had 70,000 men in the field. On their return to Beejapoor on the death of Abdul Kerrim, great confusions ensued, and the troops mutinying, Dillere Khan was obliged to return to the province, after an expensive and disgraceful campaign, in a manner leaving Beejapoor in possession of one of their Deckanee chiefs, Siddee Masood.

The general changed.

But Dillere Khan unsuccessful returns.

67. But the emperor firm in his plans, and inexorable in his resentment, though at so great a distance, persevered in his first design of reducing the country; and orders were sent to entertain all the Beejapoor and Hydrabad Affghan chiefs, most of whom had been now brought over by proportionate offers of rank and jagheers; 20,000 horsemen on one occasion were enrolled at once on the pay lists; and every exertion was made for the purpose of carrying on with effect, the most formidable operations against the Mahomedan states of Deckan, and the rising Hindoo chiefs.

Great exertions to reduce Beejapoor and most of the Affghan chiefs brought over and employed.

68. In this interval, Sevajee had not been idle. When not employed in increasing and forming his army and fleet,† he took every favorable occasion of seizing some fort, or reducing some province from one or other of the contending parties. He at one time had made a descent

Sevajee after increasing his army, consolidated his resources and formed a fleet.

* The ancestors of the Afghan or Patan chiefs of Sanoor, Canoul and Cuddapa were among the number.—See Memoirs of these families.

† In the fleet or army, it is stated in the Marhatta Memoir, that he embarked 40,000 of his mavella, and after plundering Basaroor, Sedaseevadroog, and probably all the sea ports (which occasioned an unusual terror on that coast,) and even not sparing the sacred temple of Gocurnum, he obliged the celebrated Sevapa Naik by treaty, to pay him annually 3 lacs of hoons, p. 37. His intention of extending his conquests to Casee (Benares,) is stated in his remarkable conference with Mahomed Cootub Shah at Golconda, a scheme of universal conquest, which appears to have been nearly realized by the Marhattas afterwards.

on the sea coast of Bednore, when he embarked on his own fleet, and carried off an immense booty from Barcelore. Even the succession of his eldest son Shambha, who had thrown himself on the protection of Dellere Khan in the former year,* did not disconcert him; and he had prevailed upon him to return; but soon after, contemplating vast projects and enterprizes for extending his newly-formed state, this extraordinary man died† amidst an army and a government that was formed by his own genius, and supported by his enterprizing spirit and perseverance.

Dies in the midst of vast projects.

69. In the following year, the Mogul in chief was again changed, and Dellere Khan‡ recalled, and Khan Jehan a second time recalled from the North. The Marhattas appear in this interval to have increased in numbers in an extraordinary degree, and prosecuted the war on their side with vigor. As we seldom meet their name before, doubts have been entertained whether these countless hosts were really of a nation who can scarcely be imagined to be contained within the narrow precincts of the ancient Maharastra Dasum. To resolve this doubt, it should be recollected, that a great part of the armies of the late Nizam-Shahi§ Sultans and of Bejapoor were composed of these tribes, who now resorted to their own native chiefs under a national standard, which swelled their importance, and inspired increased confidence in a cause they deemed their own; and it is probable, the fanatical rigor of Aurungzebe also excited a spirit which he could not now suppress, and this augmented that rancour and inveteracy which seems to have invited all the Hindu tribes of the Deckan at once to appear in arms in a cause that was deemed national.

* From Scott, but his dates err sometimes from 2 to 3 years, owing to some error in the computation of the Higera.

† The death of Sevajee happened, according to an authentic MS. of his life and actions, in the Hindoo year Rowdree, 1602 A. S., or A. D. 1680.

‡ Dillere Khan on his recall is said in the Marhatta Memoirs, to have been poisoned by the Emperor's orders, who was dissatisfied at his allowing Shambha to return to his father; the generosity and good faith of Dellere Khan on this occasion is highly praised by the Marhatta author, though it did not meet with the approbation of his master.

§ In the Ram Raja Cheritra it appears, that in the memorable war and battle wherein the last monarch of the Carnatic fell, great numbers of Marhattas fought in the army of the Sultan of Ahmednuggur, who was in fact sovereign of the Maharastra Dasum, and the names of their chiefs are mentioned. The same conciliating policy that induced these Hindoo tribes to fight under Mahomedan standards then, would in all probability have secured their attachment to Aurungzebe.

70. Their resistance was now become serious and formidable; it had been long continued, and under a young and enterprizing leader,* serious consequences might be expected from a longer protraction of the war. Some suspicions also seem still to have attached to the generals employed; and on consideration of all these circumstances, the emperor appears to have this year determined, with avowed design of rooting out Shambha,† to conduct the operations in person, or at least to be near enough to correct errors; having previously recalled Khan Jehan, and appointed Mahomed Mauzim again to be governor of Deckan.

To extirpate Shambha and reduce the the Marhattas, and perhaps excited by doubts of the zeal of his generals.

The Emperor resolves to prosecute the war in person.

71. Aurungzebe marching from Azmere, followed by a vast army composed of Hindoo Rajpoots, as well as Mahomedans, arrived at Burhanpoor in the beginning of the year 1682, and in the 25th year of his reign, and in a short time arrived at Aurungabad, from which ascertained period, we may reckon his return into Deckan. The war was then commenced with renewed vigor, both against Beejapoor and the Ganeems, (or infidels as they affected to call the Marhattas,) who had in the period of his absence, wrested from Beejapoor not only the whole Concan and the Upper provinces along the Western Ghauts, from Baglana to the Sanore province South, but even made themselves masters of some part of the imperial provinces. Notwithstanding a constant opposition, after various successes, the Mogul armies were at last put in motion both against Beejapoor, (where the king was at that time a minor,) and Golconda. After many fruitless attempts to ward off his unceasing attacks, the king and city of Beejapoor were taken in 1687, and

A. D. 1682. Arrives in Deckan a second time with a vast army.

The war renewed with vigor.

Extent of the new Marhatta state in this interval.

The invasion of Beejapoor renewed, and continued to the final capture of that capital and of Golconda. A. D. 1687.

* Shambha at first seemed to evince his father's spirit in seizing the reins of government attempted to be wrested from him by a party united by his step-mother Soora Baee, who wished to elevate her son Rama, the same who afterwards stood a long siege in Gingee, but he soon fell from this elevation, though in his conference with Aurungzebe he exhibited a portion of the family spirit that has conferred on his name and his tale all the decoration and lustre of the Hindoo drama and romance.

† It is not improbable but he was particularly provoked against Shambha at this time for receiving his fugitive son, Prince Akbar, who had escaped from Azimeer, and thrown himself on his protection. We find that notice was sent to the European factories in the Golconda territory early in the year 1682, but the English prudently declined any interference.

soon after Golconda also fell.* Thus both these states falling at the same time, the Mogul power was at once extended over the whole of the late divided Mahomedan governments of Deckan, and precautions were speedily adopted for reducing the Hindoo chiefs, considered as their dependents to the Southward.

72. One of the first measures after this event was to send Cassim Cawn, as phouzdar, over the province of the Carnatic, lately dependent on the two governments of Bejapoor and Golconda. That of the former is already stated to have consisted of the settled districts of Serah and Bangalore, with the forced tributaries, as the poligars of Harponelly, Raidroog, Coonderpee, Anagoondy, Bednore, Chittledroog and Mysore; but at this time they do not appear to have carried their arms across the Cavery. That province was now denominated the *Carnatic Beejapoor Ballaghaut,* while the more Easterly provinces, lately dependent on Golconda, composing the late Circars of Cuddapa, Cummun, Ghooty and Gandicotta, &c. were denominated *Hydrabad Carnatic Ballaghaut;* and the provinces below the Ghauts along the sea, extending as far South as the Palar, were denominated *Hydrabad Carnatic Payen Ghaut,* and the whole placed under the supreme command of a phouzdar, or officer possessing military and civil power, entitled a Nabob, the source and origin of the future Nabobs of the Carnatic; a circumstance perhaps not sufficiently attended to, of late years, from the separation of the two Mogul provinces, and rise of a new power in Mysore, the upper or original province of the Carnatic.

Reduction of their Southern dependencies followed.

The Carnatic formed into two provinces.

The Hindoo chiefs considered as the Zemindars dependent on them.

73. Of the changes that had in this interval of thirteen years taken place in the internal state of that country, it may suffice cursorily to notice, that the new native powers of Mysore, Bednore, Chittledroog and Raidroog had availed themselves of the difficulties of their earlier adversaries, the Patan states of Golconda and Beejapoor, who were entirely occupied in repelling the Moguls, not only to increase their acquisitions of territory,

A. D. 1670.
" 1682.

Brief notice of the state of the Carnatic during the late war.

And of the power of the Mysore, Bednore, Chittledroog and other native states.

Improvement and wise internal ma-

* After the fall of Beejapoor, he immediately marched against Golconda, which was closely besieged from 2d February to 2d October 1687, when it was entered by treachery. Havart, Vol. 2d, p. — also Madras Records under that year.

nagement of the Mysore and Bednore chiefs.

but to consolidate and improve their resources by a system of management rather to be looked for in happier times. This was more particularly the case in Mysore and Bednore, where the civil arrangements of Chick Deo Vadeyar in the former, and the sisloo or established assessment of Sevapa Naik in the latter, are still considered as models, well adapted to the nature of the country, the habits of the natives, and with great probability presumed to be founded on the more general system that once prevailed throughout the country. It is a fact well ascertained, that these standards of internal economy were established at a period when the neighbouring more powerful states were involved in all the horrors and distress of foreign invasion, or of internal weakness.*

Their origin and progress referred to another occasion.

74. Of their origin and gradual steps by which these chiefs had established themselves in the Upper Carnatic, another occasion may offer of being more diffuse;† but as much of the then condition of the Carnatic Ballaghaut, however, may be understood from the state in which it already was, about the period of the death of Chick Deo of Mysore, we shall only interrupt the course of the narration here, briefly to notice the establishment and growth of the European establishments on the coast, which at this time begin to emerge into notice, amidst the transactions in the lower country, and its reduction first by Golconda and Beejapoor, and afterwards by the Mogul power.

Brief notice of the rise and state of the European factories on the coast.

75. While the war raged in the centre of the Deckan, particularly in the country North of Beejapoor and Golconda, the provinces South of these capitals seem to have enjoyed some respite from alarm, save alone what arose from the warfare of petty chiefs, or the rumors of the long threatened but protracted invasion of the Moguls. From North to South along the coast, a line‡ of European factories had been settled

* Sevapa Naik died in A. D. 1661 after a reign of 19 years.—See Bednore Memoir——— Chick Deo died in A. D. 1704, after a reign of 32 years, from 1672, the very period in which the war with Sevajee, Beejapoor and Golconda was carried on with unceasing fury. Chick Deo assumed the regal state in 1700.

† A concise view of the origin and progressive growth of the territory and power of the families of Mysore, Bednore Ickery, Raidroog and Chittledroog in the Upper Carnatic, and of those of Madura, Ginjee, and Tanjore (not the Marhatta family,) in the lower country, erroneously called Carnatic, is in hand; but will require sometime to consult authorities.

‡ An ample Account of the establishment of the Dutch factories of Tutocorin, Negapatam,

since the close of the ancient Hindoo regime, and under the sanction of the new lesser states, who from the earliest period seemed inclined to encourage these settlements from motives of benign encouragement to their subjects' trade and commerce. The Golconda kings also, from undoubted evidence,* appear to have embraced the same maxims. The difficulties sometimes occurred from the exactions of their governors; and factories were established even in the interior and more remote parts of the country of Golconda, which have since that period of devastation and ruin, been consigned to oblivion.†

Hindoo rajahs and the Golconda government encourage their commerce.

76. The invasion of the Gingee country, and of that along the coast by the Beejapoor generals, and soon afterwards by Sevajee, had indeed interrupted their tranquillity, and considerable devastation appears to have taken place in the tract extending to the coast from the Palar to the Coleroon, where the commerce and industry of the country received a shock that it did not recover for many years;‡ but this devastation seems not to have extended into the province of Tanjore, South of the Coleroon, wherein Eckojee appears to have exercised a regulated system of administration, much resembling the model established by his father in the districts of Bangalore and Colar, and which was attended in that country with an in-

Their trade in connection with the commerce and industry of the country disturbed about Porto Novo, by Sevajee's irruption.

But it does not appear that the interior of Tanjore was much disturbed by Eckojee's invasion.

Who in Tanjore followed the mode established in Bangalore by his father.

Tegapatam, Sadras, Pullicat, Masulipatam, Dacharam, Bimlipatam and their commercial lodges at Golconda and Nagulvansa, are given in Havart's work, published at Utrecht about 1692; also in Baldeus and Valentyn. They were established before the first voyage of the English to this coast, and the Dutch appear to have opposed their forming a commercial establishment at Pullicat so early as ——— See Flori's Voyage in Astley's Collection, Vol. — p.—

* See the series of 14 Grants or Firmans by the Golconda government to the Dutch (in Havart) for Negapatam, Masulipatam, &c.

† Travelling by accident by Nagulvansa, not far from Cummamett in the Nizam's dominions in 1797, a part of the country overun with jungle, and shewing evident vestiges of better times, I accidentally met with a Dutch tombstone, which led to the discovery of the riches of their factory. In Havart's work this inscription is preserved, and we there meet an account of that establishment and of its capture during the invasion in 1687. It is needless to observe that it has lain in ruins ever since, and the whole of that country, which then furnished cloth of a particular kind for a Dutch investment, has never recovered the calamity.

‡ Baldeus under the year 1660 says: "The king of Beejapoor not long before made an inroad into the country of Tanjore: and the marks of the famine are still visible, p. 588; we may therefore suppose the few years before to coincide with the period of 1657, but this devastation extended only to that part of the country of Tanjore which extends along the coast about Negapatam and Porto Novo, where the Dutch investment and factories were ruined.—See Havart.

crease of national wealth that has extended to near our own times, and might even vie with the most flourishing state of Agrarian improvement that has been attained in civilized Europe.*

And after its acquisition, rejected the proposal of extending his conquests.

Eckojee's conduct is best explained by referring to the history of his earlier life, and to the difference of character exhibited by the two brothers, sufficiently apparent in the account of their conference, and the fruitless attempts to induce him to extend his dominions by conquest; the forbearance that on this occasion, and under such temptations he shewed, induce some doubts of the fidelity of those accounts that represent his acquisition of Tanjore to be attended with peculiar circumstances of flagitious rapacity; but whether that expedition was influenced by motives of obedience to his liege† sovereign as alleged, or of a spirit of adventure and chivalrous enterprize, not unknown to the Marhatta tribes at that period; whatever might be the exciting causes of Eckojee's expedition to Tanjore, it was conducted with an address and decision highly favorable to his reputation as a statesman and warrior; though he appears immediately after to have relinquished the last, for the more pacific occupation of improving and systemizing the natural resources of a fertile country; and thus he furnishes a third instance of a Hindoo chief studying with assiduity the internal economy of his state, with a success that enriched his subjects, and ennobled his name. These remarks on the first Marhatta administration may not be out of place here, in explaining the state of that country, on whose coast the most considerable European factories were then situated.

And applies to the internal improvement of his country.

77. A more detailed account of the progress of their establishments (particularly the English,) would be interesting, and not without its use; but it is not consistent with the brevity of this attempt, or the defective accounts within our reach at pre-

Documents of the early state of the English settlements.

"* The countries on the Po, under the systematical arrangement of the Cadastre, and by recourse to irrigation, are presumed to be the richest and most productive lands in Europe, excepting the Flemish Netherlands, nearly equally productive and populous.

† This European phrase is used with some diffidence. It is expressly stated, that he was called in to the aid of the Tellinga Naik of Tanjore, as a general of Beejapoor, and it would appear from the language put in his mouth, that he admitted this: "We are managing the affairs of the Padshah of Beejapoor, and in his service, therefore it is not proper to act against the Padshah."—Marhatta Memoir.

sent, to extend it beyond a rapid sketch. In such documents as exist of our national records, the accounts of the native governments, of their history, politics, and of the geography of the country are vague and unsatisfactory; indeed our countrymen do not appear to have then conceived it necessary for their views to enquire much further than what immediately related to their investments and commerce close to the coast, and an entire indifference, if not ignorance of the real state of the country prevailed. At all times they appear to have been under considerable alarm for the safety of their settlement, and their employers' interests, though not an instance occurs of inhumanity or ill-treatment from the natives, Mahomedan or Hindoo, such as of late years, the irritation of warfare, or the disappointment of ambitious projects may have occasionally produced; and which might then have been supposed with some reason to have excited apprehensions amongst contending nations for their personal safety. Various instances occur of individuals passing safely throughout the country. Among the causes of alarm, we find the settlement at times by the contentions among the castes and tribes of new settlers, and the whole of the working and most useful lower classes induced to abandon the new-formed colony, and recurring to a secession to the neighbouring settlement of St. Thomé, at whose expense most of the population was avowedly formed originally.

Unsatisfactory.

Occasionally disturbed by the troubles of the country.

And by contentions among the native settlers.

78. The settlement of Madras was originally established about A. D. 1639, being transferred thither from Armigam,* where the half-finished ruins of their first fort still remains. Of the founding of the colony, and of the first 33 years, no records whatever appear. Their first attention to the politics of the native powers seems to have been powerfully excited by the sudden appearance of Sevajee so near to Madras; they then deputed an agent to his camp, after whose return they ap-

No record of the first 33 years.

A. D. 1639.
A. S. 1568.
A. D. 1672.

* Armigam is situated near Durajapatam on the Coast, 60 miles North of Madras. I had an opportunity of seeing these remains in 1798, consisting of two small bastions on a single curtain of brickwork of no great extent; the occasion of the removal is not well known, but it appears that the fort was never finished. The first Grant of Madras by Sree-Runga-Rayel in A. S. 1561 or A. D. 1639, was inscribed on a golden olla, which is said to have been lost at the capture of Fort St. George by La Bourdanaye in 1747.

pear to be better acquainted with the state of parties, and notices occasionally occur of a more intimate knowledge of the native character, and a greater confidence in their own strength and superiority in arms, even over that of the more powerful Mogul emperor, against whom the three English establishments actually made war in the height of his success; and this confidence we may presume, naturally cleared the way to those events that on the general confusion succeeding Aurungzebe's death, led to the establishment of our power in this quarter.*

A. D. 1686.
" 1687.

79. On an attentive inspection of all the documents of these times that have come into our hands, it appears, that though the Mysore chiefs had as yet no connection with the Eastern sea coast, their name was known and even respected in the lower provinces along the coast, and that though they had yet no political relations with that country, the successful resistance of the *Naig of Mysore* (as he is called) to the depredations of the Marhatta armies of Sevajee, was well known at Madras.†

80. The factory of Fort St. George only established — years before, was still so weak and ill-manned, that a considerable uneasiness arose from their state among the contests of the hostile parties; they yet conducted themselves with a considerable degree of prudence and caution, and while they sent compliments, antidotes and counter-poisons, to Sevajee, they prudently declined complying with his special request of military aid; and when the Patan chief Daood Khan, soon afterwards approached, after the conquest of Gingee, they no less sagaciously accommodated themselves to his favorite humors, in consequence of which they were not only saved from the threatened spoliation, but obtained grants of land, of villages, and of factories from all parties ‡

81. The Dutch on the other hand, who had been earlier established on these coasts, and whose power in India had been more firmly consoli-

* Consultations at Madras, and correspondence with Surat and the Bay on the subject of the intended attack on the Mogul, and on the subjects of Siam in 1686.

† Madras Records.

‡ The factory at Cuddalore was purchased from the agents of Rama at the moment he left Gingee in 1692 for 30,000 pagodas, (see Havart,) St. Thomé, Egmore, &c. three villages were purchased from Daood-Khan in 1693; they had long sought it, and were uneasy and apprehensive of the French designs to settle there.—Madras Records, 1701.

dated under the general government established at Batavia, appear about this time to have felt a sensible decline of their commerce and trade on the coast of Coromandel, in consequence of which, a Commissary General with unlimited powers had been sent out to enquire, and reform their establishments on the coast. The celebrated Van Rheide,* (a name well known to the cultivators of Indian science,) appears to have executed this invidious duty with a rigor and zeal that excited those compliments and remonstrances that are ever found in public reforms to follow individual inconvenience. His death happening at sea, proceeding to Surat, prevented the further execution of his plans, which from some of the works published in Holland about that time, appear to have been loudly inveighed against by their servants in India. Even the industrious Havart gives place to too much of these invectives, to warrant a full credence of his reflections on the plans of reduction and reform, of which the expensive fortifications of Negapatam, and the removal thither of the seat of government on the coast, formed a part. How far they were followed or departed from, does not appear; but it is observed, that the decline of the Dutch power and commerce on this coast from that period, proceeded with a slow though imperceptible progress down to our own times.

82. The Dutch, however, appear to have been then sufficiently sen-
A. D. 1686. sible of the weakness of the Golconda government, since they ventured to seize upon the fort of Masulipatam, then a very considerable mart (in 1686,) in retaliation of some commercial injuries scarcely warranting such a measure; but they restored it soon after, in the November following. Immediately after the conquest of Golconda, they sent an embassy to Aurungzebe, and Mr. Bacherus obtained some immunities, and a renewal of their privileges.

83. In perusing the works from which these notices are derived, it appears that the Dutch Company's servants had by special orders from Europe paid particular attention to acquire and methodize an useful knowledge, not merely of the commercial advantages and trade of their own establishments, but of the internal resources, geography,

* Henr. Adr. Van Rheide after having served long in India and returned to Europe, was sent out in 1684 on a salary of 1,000 guilders per month, to reform the Dutch establishments. He was on the Coromandel Coast from 1684 to 1687, and died at Sea in December 1691 near Bombay, on his way to Surat.—Havart, Vol. III, p. 59.

history, politics and literature of the states and countries in which their earlier settlements were situated.

84. In pursuit of this useful species of knowledge, some of their servants appear at least to have distinguished themselves by a perseverance not unsuitable to the prevailing habits of that nation; and the scientific works of Rumphius* and of Van Rheide, and the historical works of Baldeus and Rogers derived from this source, will always draw approbation. The first of these are more generally known, than the humbler, though equally useful, labors of Valentyn† and Havart, who at this period cultivated a walk that furnishes the first specimens from India of works, forming an useful basis and aid to modern‡ speculations on the political economy of these countries.

85. Even in those tours which their servants occasionally made from one factory to another, their journals convey a degree of information that, not long since, was rare; and would have been desirable to the historian, the naturalist, or the geographer; and which, there is reason to suspect, was lately little known in England.

86. The factories of the other European nations at this period appear to have been of little importance. The Dutch commerce, notwithstanding the sums expended in fortifying Negapatam, had fallen into a mortal state of decay. The Danes at Tranquebar maintained a doubtful and interrupted communication with their mother-country,

* The Thesaurus of Rumphius, and the Hortus Malabaricus of Van Rheide contain extensive and useful details of the Natural History of India. It appears that Van Rheide also extended his enquiries to various other branches of useful knowledge. A classification of the 72 tribes of the inhabitants of Malabar, prepared at his suggestion, lately came into my hands written in old Dutch: the writer notices that it was prepared for Van Rheide.

† The work of Valentyn consists of 8 huge folio volumes, containing, among much rubbish, most useful details of all the Dutch settlements and forts beyond the Cape of Good Hope. Among them is an account of the history and state of Persia, and a History of the Mogul Emperors, with details not known in England till Dow's work appeared in 1772. The work of Havart, published at Utrecht in A. D. 1692, professes only to give a view of the rise and fall of the commerce of the Coast of Coromandel: though loaded with the characters, epitaphs and eulogies of Company's servants, it yet contains a faithful picture of the times, and a just account of the court and politics of Golconda at a very interesting period immediately previous to this conquest. The visit of the king to Masulipatam, the account of Mr. Pitt's Embassy to Golconda, and the notices of Sevajee, are curious; and the papers on the Indian manufacture of steel, and the account of assaying gold at the mint of Pullicat, are useful.

‡ The same sentiments and turn for cultivating a knowledge of political economy appear to have prevailed still later, and gave rise to the establishment of an Asiatic Society at Batavia in A. D. 1780, in the eight Vols. of whose proceedings several very useful papers appear.

while their reputation among the other European settlers suffered, as a commercial establishment, by proceedings stigmatized as little short of piratical. The respectable Protestant missionary establishment had not yet been established, nor the labors of the Apostolic Zinganbalg and his successors begun. The French after the loss of St. Thomé had not yet retrieved their military reputation among the Hindoos, and the establishment at Pullicherry was yet in its infancy. Of the Swedes nothing was heard, and the once vast power of the Portuguese on the coasts of India was now restricted to Goa. With the Spaniards of Manilla, some intercourse of commerce by annual ships appears to have been maintained from Madras, by which a certain quantity of silver was annually imported; but by far the greater quantity of that metal, which appears to have been but recently introduced into India, was imported directly from Europe, together with a certain proportion of gold, a species of commerce that has now entirely ceased.

87. Notwithstanding the competition and rivalry incidentally arising from the pursuit of the same commercial views among the European factories at this period, an amicable spirit and mutual civilities prevailed in their intercourse in this distant part of the world; nor is it less honorable to the memory of the founders of this colony, to observe the early English discouraging and forbidding the traffic in slaves, of which the nation has at last signified its marked disapprobation. By a proclamation so early as 1686, the government of Madras forbad in the most positive terms the exercise of this commerce within their limits, and of which the long continued war and a destructive famine of two years, (1686 and 1687,) had increased the usual bounds, and this discouragement of a traffic that even met the sanction of national treaties* in the West, has in the East been continued to be viewed with disgust to our own times.†

88. Such was the general state of the country of Carnatic, compre- A. D. 1687. hending the upper provinces, or Balla Ghaut as now called, and the lower tracts on the Eastern coast, then called in European

* The Assiento Contract by which the nation sanctioned the supply of the Foreign Colonies of Spanish America with slaves from Africa is alluded to here, and the several transactions connected with it.

† On reducing the Dutch Colonies in Ceylon in 1795-6, the British commanders early forbad, by proclamation, the trade of slaves from the coast, whence numbers it appeared had been fraudulently kidnapped and conveyed away.

writings Coromandel, when the conquest of Golconda and Beejapoor opened the way in this year to the extension of the Mogul dominions, and their system of financial administration was first introduced and proposed to be extended along with their arms into the provinces of the South.

In considering the gradual changes in the state of the Carnatic, the next great period that attracts attention and interest, comprehends nearly 55 years, from the conquest of Golconda and the Carnatic until the formation of the Dufter Assoofiah, soon after the return of Assoph Jah into Deckan, and assuming independency.

In this period comes to be considered the progressive extension of the Mogul system of government into the South, the causes that retarded a more rapid and general progress, arising in the civil wars that arose among the successors of Aurungzebe, which afforded room to the new Mahratta state to strengthen and expand itself; and ultimately weakening the provincial Mahomedan government, gave rise to three modern states in the Deckan independent of all control, and the two Nabobships of the Carnatic, gradually terminating in the government of Mysore and that of the Carnatic Payen Ghaut.

(To be continued.)

Notices of various Mammalia, with Descriptions of many New Species: By Ed. Blyth, *Curator of the Asiatic Society's Museum, &c.*

Part I.—The *PRIMATES, Lin.*

Simiadæ. When last I had occasion to treat of this group, I remarked *(J. A. S.* XII, 176,*)* that, at that time, the only ascertained species known to inhabit the countries bordering on the Bay of Bengal to the eastward, were the *Hylobates lar*, which I suggested to be the most common species of Gibbon found in the interior of the Tenasserim provinces, as alluded to by Dr. Helfer,—and *H. syndactylus*, which, according to that author, extends as high as 15° N. lat., a statement which, however, it would be satisfactory to have confirmed. It now appears that the *H. lar* is diffused so high as Arracan, where Capt. Abbott, Assistant to the Commissioner of the province, and who is stationed in Ramree, is acquainted both with it and *H.*

hoolock as inhabitants of that island (?). In Arracan, however, the Hoolock is the prevalent species of Gibbon, and extends thence over all the hill ranges of Sylhet and Assam;* while the *lar*, or White-handed species, is found southward to the Straits. The Society has lately received a pale specimen of the Hoolock from Capt. Phayre (Senr. Asst. to the Commissioner of Arracan, and stationed at Sandoway), which closely approaches to that in the Zoological Society's Museum, which was described as a distinct species by the name *H. choromandus*, being, however, a trifle darker, and considerably darker than the very pale example from Assam noticed in X, 839. Another Hoolock in this Museum is again much darker than the Arracan specimen, and we have retained a third of the usual intense black colour all over, with the exception of the constant white band across the forehead.

According to Mr. J. Owen, who resided upwards of two years among the savage Nagas and Abors who inhabit the wooded mountain ranges to the eastward of Upper Assam, the Hoolock abounds in those upland forests, associating in societies of 100 or 150 individuals, the combined noise of which may be heard to an immense distance. In general, they keep to the tops of the highest Oolung and Mackoi trees (*Dipterocarpi*), to the fruit of which they are very partial; but on several occasions, when emerging from a foot-path through the dense forest into the open ravines formed by the action of the mountain rapids, Mr. Owen mentions having come suddenly upon a party of them washing and frolicing in the current, who immediately took alarm and retreated into the jungle: but in one instance, as he was proceeding solitarily along a newly made road through the forest, he found himself surrounded by a large body of them, impelled perhaps as much by curiosity at his European dress and appearance, as by resentment at the intrusion of a stranger upon their domain; the trees on either side were full of them, menacing with their gestures, and uttering shrill cries; and as he passed on, several descended from the trees behind, and followed him along the road; and he feels sure that they would soon have attacked him, had not his superior speed on the

* It is even found in some parts of Mymunseng. Buchanan Hamilton's *MSS.*: upon the authority of Mr. Dick, formerly Judge and Magistrate of Sylhet.

ground enabled him to escape. Having at first, relates Mr. Owen, to cross a number of felled logs, it was really no easy matter to get away; but the clear and open road once gained, he was not long in distancing his pursuers. Upon his return, after this threatened attack of the Hoolocks, Mr. Owen asked his Assamese interpreter, (who had been brought up in the hills,) whether it was usual for these Apes to manifest so hostile a disposition; and he was informed that only a few days before, as a party of Nagas were proceeding along one of the tortuous jungle paths, necessarily in Indian file, the foremost man who was a little ahead of the rest, was actually attacked and severely bitten on the shoulder, and would probably have been killed by his assailants, had not others of his party opportunely come to the rescue, upon which the Hoolocks immediately fled. Indeed I can testify to the capability of these animals to inflict serious injury, from having witnessed a tame female of the Sumatran *H. agilis* suddenly attack her keeper, by springing up at him, grasping his body with her four limbs, and biting at his chest, when it was fortunate for the man that her canines had been previously filed down; in consequence, as was said, of her having occasioned the death of a man at Macao.* According to Mr. Owen's account, the Hoolocks would also appear capable of destroying large snakes; for his attention was once arrested by the noise which a party of them were making on the tops of some lofty trees overhead, when after a while he was startled by the fall of a *Python* Snake, of about six or seven feet in length, within a few paces. The reptile was nearly dead, or for that matter might have been disabled by the fall, but it had been severely bitten and lacerated, no doubt by the Hoolocks above, who were unquestionably the cause of its precipitation.

Of the Javanese species (*H. leuciscus*, F. Cuv.), the Society has lately obtained a fine female specimen, the colouring of which is somewhat remarkable, although nearly resembling that of a male described and figured in the unpublished MSS. and drawings of the late Dr. Buchanan Hamilton. General hue pale greyish-brown, or rather

* From what I have seen of the Gibbon tribe when brought up tame, no animals could be more gentle and good-tempered; but the lady in question had good reason for the utter hatred which she bore to her keeper, who used to make her display her wondrous activity a hundred times a day, in swinging from bough to bough of a large artificial tree by means of her fore-limbs only, by frequent application of the whip.

brownish-grey, darker on the nape, shoulders, and limbs, and the inside of the thighs blackish anteriorly; the outside of the thighs, and the legs and feet above, are pale; the hands are washed with blackish: crown of the head black: a whitish ring encircles the face; the throat, sides of the throat, entire under-parts, and especially the lumbar region, are also whitish, but a dark brownish-grey line extends down each side of the breast and belly, commencing from the arm-pits, and terminating in the blackish inner side of the thighs. As compared with the Hoolock, this species has the coat very much more close and woolly, the hair adhering in flakes, more particularly on the back. That of *H. lar* (the only additional species we possess) is just intermediate.*

I also suggested, upon the same occasion, that the Tenasserim *Semnopithecus maurus* of Helfer would probably prove to be the *S. obscurus*, Reid: and the Society has now received skins of the latter species from Capt. Phayre, and some living young specimens from Capt. Abbott; and the skull of this animal, compared with that of a skeleton prepared from a Tenasserim specimen sent in spirits by the late Dr. Helfer (vide VII, 669), leads me to refer the latter also to the same species, which, it may be remarked, is the only member of its genus as yet ascertained from Arracan southward to the Straits, where (in the vicinity of Singapore) specimens of it were obtained by Mr. Cuming.

* On the subject of Orang-utans, I took the opportunity before referred to, to offer a few remarks (*vide* pp. 167 and 182). Since then, the Society has fortunately recovered a fine skull of the male *Mias Rambi*, noticed as presented by Major Gregory (VII, 669), which had been missing from their museum, and was consequently unnoticed in my remarks on the genus. I have also lately received a letter from Mr. James Brooke (of the Borneo settlement), wherein that gentleman notices the dark colour of the *Rambi* as compared with the *Pappan* and *Kassar*. He remarks— "I concur in what you say regarding the *Wurmbii* and *Abelii* being referred to one class [species]. The *Kassar* in every specimen which I have seen, is of the same colour as the *Wurmbii* or *Pappan;* but the *Rambi* is of a *dark brown* in the two I have seen—one an adult female—the other a young but a large male. The *Rambi* is probably intermediate in size to the other two species. I am aware how little general importance is to be attached to colour, but among the very numerous specimens of the *Pappan* and *Kassar* I never found one of this dark colour, whereas the only two specimens of the *Rambi* which have fallen under my notice were both similar and both dark brown. A little further personal enquiry would settle the matter beyond dispute; and I hope soon to have the countries open to me, when I shall feel great pleasure in forwarding you specimens either of skeletons or skins."

The skins adverted to are those of full grown animals, and they accord very well with the description of the species furnished by Mr. Martin ; but two very conspicuous characteristics of the living animal might pass unnoticed in these skins, namely, the variegation of the face, which is of a leaden-black, contrasting with pinkish flesh-colour on the mouth and lips, extending to the lining of the nostrils, besides which a large semi-circular mark of a paler and more livid tint occupies the inner half of each orbit,—and secondly, a longitudinally disposed erect crest upon the vertex, rising abruptly from amid the rest of the hair of that part, and being analogous to that of the Sumatran *S. cristatus*, (Raffles,) with which I should not be surprised to find the present species identical : Raffles, however, says nothing of the variegation of the face, and he remarks that "the young *Chingkaus* are of a reddish-fawn colour, forming a singular contrast with the dark colour of the adults," whereas very young examples of the present animal agree in colour with full grown ones ; he also mentions that the under part of the body is merely "paler," while in the Arracan animal this is dull white, and purer white in the young. In adults, the whole hair of the crown is much elongated, the tuft still rising up among the rest ; and that forming the whiskers stands far out on each side, forming lateral peaks in addition to the vertical one. Five examples before me (three of which are alive) exhibit scarcely any difference in shade of colour, all being of a ashy dusky-black, darkest on the head and extremities, a good deal silvered on the back, white underneath or in front, and the tail more or less albescent either at base only, or for the basal half or two-thirds, or even the entire tail ; there is little trace of beard, and the shortish scanty hairs growing upon the flesh-coloured lips are white. The young, besides a whining noise, to express their wants, frequently emit a mewing cry that might be mistaken for the mew of a cat.

To the same group of *Semnopitheci* belongs my *S. pileatus, J. A. S.* XII, 174, a species which abounds on the skirts of the Tipperah hills, retiring far into the interior during the rains, (as I am informed by F. Skipwith, Esq., Judge and Magistrate of Tipperah, to whom the Society is indebted for some interesting zoological specimens,) and it would appear also to extend sparingly upon the Naga range eastward of Upper Assam. A fine specimen of an old male has

just been presented to the Society by the Rev. J. Barbe, R. C. Missionary, which was shot by him during his recent visit to the wild Kookie tribes of the Chittagong hills; and the same gentleman had previously favoured us with a more than half-grown male killed in Tipperah. These two differ considerably in shade of colour from the young female formerly described, having the whiskers, throat, chest, and front of the shoulder, very deeply tinged with ferruginous,—the rest of the under-parts, the legs all round (from the knee), and much of the humerus, less so,—and the head and back of a more dingy ash-grey, being sullied with the prevalent rust-colour: the half-grown female before described has merely a faint tinge of ferruginous on its whitish under-parts, and the back and limbs are very delicate pure grey.* In the old male, the tail is of the colour of the back at base, becoming gradually black, which last occupies the terminal third or more: the fingers and toes are blackish, with an admixture of this on the back of the hands: the long black superciliary hairs spread into two lateral masses (in all three specimens,) and are very copious, and between and above them, immediately over the *glabella* or inter-orbital space, the hairs of the forehead are conspicuously tinged with ferruginous: those on the crown are not elongated as in the preceding species, nor is there any trace of vertical crest; but they are a little lengthened beyond those of the occiput, sinciput, and temples, which they accordingly impend, and thus is presented somewhat the appearance of a small flat cap laid on top of the head, whence the specific name. The length of fore-arm and hand (of the adult male), to tip of longest finger, is above a foot; knee to heel nine inches; foot about seven inches: and length of skull about five inches.

As a third continental species of this subgroup, I suspect must be brought together the *S. cephalopterus*, (Zimmerman,) from Ceylon, with which Mr. Martin identifies the *Lion-tailed Monkey* β, and the *Purple-faced Monkey*, of Pennant, the *Guenon à face pourpre* of Buffon, *Simia dentata*, Shaw, *Cercopithecus latibarbatus* of Geoffroy, Kuhl, and Desmarest, *C. leucoprymnus*, Otto, *Simia fulvo-grisea*, Desmarest, *Simia leucoprymna et S. cephaloptera*, Fischer, *S. nestor*, Bennett, and *S. leucoprymnus et S. nestor*, Lesson, — and the *S.*

* A half grown male just received from Mr. Skipwith is intermediate in its colouring.

Johnii, Fischer, from the Neilgherries, to which Mr. Martin only refers the *S. cucullatus*, Is. Geoffroy. From specimens now before me I think there can be no doubt of the identity of all of these, and that the species both inhabits the Neilgherries and the mountains of Ceylon: but Mr. Martin erroneously identified one specimen in the Paris Museum with the present species, as I have shewn in *J. A. S.* XII, 170; the animal in question being evidently my *S. hypoleucos*, *J. A. S.* X, 839. The name *cephalopterus* would have to be retained, and the animal appears subject to considerable variation of shade; a half-grown female before me resembling Mr. Martin's figure referred to *S. cephalopterus*, except that the croup is pale-grey as stated in the description, the hair there being shorter; and there is an admixture of this on the thighs, and slightly up the back: the whiskers, and hairs on the lips and chin, are dull white; and those of the crown dull chesnut-brown, and lengthening on the occiput: the tail of this is whiter to the end. An old male, on the contrary, has dark dull chesnut-brown whiskers, concolorous with the hair of the crown, and some blackish hairs growing in front of them; and his tail is blacker to the end: the hair on the crown is all elongated, but increasing in length to the occiput, where some of the hairs exceed five inches in length, and tend to be albescent, a sort of dingy isabella colour prevailing, which is not easy to express in words. On the short hair of the croup, and upon the thighs, the same grey colour appears as in the young female specimen, but is mingled with black, and considerably less albescent. The bodies and rest of the limbs of both are deep black, but picked out a little with greyish in the young female. I consider these two specimens to respectively represent the *S. cephalopterus* and *S. Johnii* of Mr. Martin's work, the latter (or old male) being certainly from the Neilgherries, and the other I purchased alive in Calcutta, and could not learn whence it had been brought: but I am quite satisfied of the specifical identity of the two, and have seen others variously intermediate. Upon these grounds I venture to bring the two alleged species together.

The other Indian *Semnopitheci* form a particular subgroup, well characterized by their physiognomy; and all of them have a radiating centre of hair on the forehead, a little behind the superciliary ridge. They have been mostly confounded under *S. entellus*.

The most different from the rest is *S. hypoleucos*, Nobis, *J. A. S.* X, 839, and XII, 170; which is characterized by its comparatively small size, deep colouring, and black fore-arms and hands, feet, and tail; the head being of a dirty pale straw-colour. Inhabits the Malabar range and Travancore.

Next, *S. entellus* (verus), F. Cuv., is the representative of the group in Bengal and Assam, extending (as I have been informed) into Cuttack. It has constantly black hands and feet; the fore-arm and leg externally, with the croup, are of a pale *chocolat au lait* colour, extending more or less over the back, humerus, and thigh; and the rest is of a light straw-colour, or pale isabelline, with occasionally a tinge of ferruginous on the belly. It is figured by the late Mr. Bennett in the 'Gardens and Menagerie of the Zoological Society.'

Very different is the *S. priam*, Elliot, of the Coromandel coast, which has nought of the yellowish tinge, the whole back and outside of the limbs, with the crown of the head, being nearly of the *chocolat au lait* hue confined to parts of the former, but having more of the *lait* in it, and as usual being most intense about the croup; the hands and feet are *pale* and concolorous with the rest of the limbs; the whiskers and occiput whitish; and a strongly marked peculiarity consists in having an abruptly rising erect crest upon the vertex, analogous to that of *S. cristatus* (vel? *obscurus*).

The *S. anchises*, Elliot, represents the former in the Deccan and along the foot of the western ghauts. A skin presented to the Society by that gentleman, with three examples of *S. priam*, resembles the darkest specimens of *S. entellus* in colour, but has the leg from the knee whitish (perhaps not a constant distinction), the hands mingled white and blackish, and the feet whitish, with dusky black above the base of the toes and on their terminal phalanges; but the coat generally is much longer than in *S. entellus*, the hairs on the sides measuring four, five, and even six inches in length, and those which grow upon the toes, and in a less degree those of the fingers, which are very copious, are also remarkably elongated, extending considerably beyond the tips of the toes, which thus present a Spaniel-like appearance. Mr. Elliot, to whom the merit is due of first distinguishing these species, and who is well acquainted

with both of them, will shortly describe their characters more minutely.

The same gentleman has also forwarded for my inspection an imperfect skin of a half-grown animal, received from the Coimbatore district or its vicinity, which presents the colouring of true *entellus*, and has the black hands and feet well marked; but the coat is different in texture, the hairs of it being quite straight, and not exhibiting the waviness which is constantly observable in those of *S. entellus* of every age, causing the light to fall irregularly on each hair of the latter species, while on those of the specimen in question, as in *S. anchises*, the shine is uniform, and the sames traightness of hair is observable in *S. priam:* this may appear a trivial distinction, but it is nevertheless a well marked one, which at once characterises *S. entellus* apart from either of the others; and I incline to consider, for the present at least, the skin under consideration to be a doubtful variety of *S. anchises*, the more especially as its coat is also longer than in specimens of *S. entellus* of corresponding age.

Another allied species, of which the description does not tally with either of the foregoing, is the *S. schistaceus*, Hodgson, *J. A. S.* IX, 1212, "from the Tarai forest and lower hills, rarely the Kachar also," of Nepal; and which would seem to approach nearest to *S. anchises*. It is described as — "Dark slaty above; below, and the entire head, pale yellow; mere hands and feet somewhat darkened or concolorous with the body above; tail also concolorous: hair on the crown short and radiated; on the cheeks long, directed back, and hiding the ears: piles or fur of one sort, neither harsh nor soft, more or less wavy; three to five and a half inches long upon the body, closer and shorter on the tapered tail, which is more or less tufted."

The Mussoorie Lungoors have been thus described to me by Capt. Thos. Hutton, from whom I hope shortly to receive some specimens. "I fell in," writes that observer (in a letter dated Dec. 30th,) "with a whole lot of Monkeys this morning, and took a leisurely survey of them; they were dark greyish, with pale hands and feet, white head, dark face, white throat and breast, and white tip to the tail. This is I think the Nepal and Simla species. The *Macacus rhesus* is found here also, but I do not remember it in the winter, though it may re-

main in some of the deep warm valleys."* Elsewhere, he remarks, "I have long thought that the *Lungoor* of our parts must be distinct from the *S. entellus* of Bengal, on account of the different locality in which it is found, for assuredly were the Entellus to occur here in summer, it would retire to the plains on the approach of winter. Our species, on the contrary, seems to care nothing for the cold ; and after a fall of snow a glen on my estate which opens to the N. W. is crowded with them. In fact, I really believe they are more numerous during the cold than during the hot weather. On the Simla side, I observed them also, leaping and playing about while the fir-trees among which they sported were loaded with snow-wreaths. I have seen them at an elevation of little short of 11,000 ft. even in the autumn, when hard frost occurred every night, and that was at Hattoo or Whartoo mountain, *three* marches in the interior from Simla. * * * It grows to a goodly size, and is rather a formidable looking fellow." Captain Hutton's suggestion that the Himalayan *Lungoor* must be different from the Bengal *Hoonuman*, because of the diversity of climate which they inhabit, is in part nullified by the fact that the *Macacus rhesus* inhabits alike the Himalaya and the Bengal Soonderbuns; and it also remains to ascertain how high the *S. entellus* may extend upon the Northern mountains of Assam: moreover it is by no means clear, from the above descriptions, that Capt. Hutton's Mussoorie *Lungoor* is identical with Mr. Hodgson's Nepalese species.

Returning now to the determination of the *Simiadæ* found eastward of the Bay of Bengal, Dr. Helfer mentions two species of *Macacus*, stating that "the *Cercopithecus cynosurus* [*cynomolgus?*] inhabits chiefly the banks of rivers, and the mangrove forests, being chiefly fond of shell-fish": and that "Another species of *Cercopithecus* belongs to the rarest of this genus, and is found chiefly in the northern parts, upon isolated limestone rocks." There can be little or no doubt that the two following are the species referred to: and to Capt. Phayre is due the credit of first securing specimens of these animals

* In *J. A. S.* VI, 935, Capt. Hutton states, of the *M. rhesus* — "This species I saw repeatedly during the month of February, when the snow was five or six inches deep at Simla, roosting? in the trees at night, on the side of Jakú, and apparently regardless of the cold."—*Journal of a Trip to the Burenda Pass.*

for examination, the Society being already indebted to that gentleman for numerous other specimens of Arracanese mammalia, several of which are new, and for nearly 200 species of birds, besides specimens in other classes, to all of which he is continually fast adding.

Macacus nemestrinus (?) A huge specimen of what I conceive to be merely the common *Pig-tailed Monkey* of authors, numerous in Sumatra, (where three *varieties* of it are alluded to by Raffles, who terms the species *Simia carpolegus*,) if not also in other parts of the Malayan archipelago and peninsula, differs from ordinary specimens of its race, such as are commonly seen in captivity, in the developement of its coat of hair, especially on the fore-quarters,—in having the crown merely infuscated, instead of black (or nearly so),—and in the terminal tuft of its tail being bright ferruginous; besides which, there is a strong tinge of golden-ferruginous about the shoulders. The coat is fine in texture, and upon the fore-quarters the hairs of it measure from four to five inches long; on the loins they scarcely exceed two inches, and on the under-parts are comparatively scanty; the general colour being that prevalent among the *Macaci*, or grizzled brown, the piles annulated with dusky and fulvous; crown darker, and the middle of the back posterior to the lengthened hair is also darker, becoming black along the upper surface of the tail, which has a bright ferruginous tuft as before noticed: but there is no trace of this upon a very young specimen also sent, which has likewise little appearance of annulation to its fur, and the colours generally are subdued and much paler. A live example (of undoubted *nemestrinus*) which I possess, about a third grown, begins to shew the grizzling or annulation to the fur of its fore-quarters, but no sign as yet of the rufous tail-tip. Upon the whole, the very large fine specimen under consideration, does not differ more from ordinary domesticated examples of the Pig-tailed Monkey, than does an unusually fine wild old male of the *M. rhesus* which I procured some time ago in this vicinity, from such domesticated specimens of the latter as must be familiar to the observation of most naturalists who are conversant with the study of mammalia. Capt. Phayre obtained these animals in a mountainous and rocky situation, and it is doubtless Dr. Helfer's second species of (so called) *Cercopithecus*. It belongs, indeed, (as does also *M. rhesus*,) to the division *Papio* of Mr. Ogilby, which comprehends all the short-tailed *Macaci* of Cuvier; but

not, as I suspect, to the *Papio* of Prof. Owen,* which I have reason to believe applies to the long-tailed African Baboons, or the *Cynocephali*, Auctorum, exclusive of *C. mormon* and *leucophæus*, on the Mandrill and Drill: whereas the long-tailed *Macaci*, such as the next species, together with *M. radiatus* and *M. sinicus* of S. India, are referred by Mr. Ogilby to *Cercopithecus*. But the truth is, that if we once commence dividing the group *Macacus*, as now generally recognised, nearly every species of it might be selected as a subgeneric type *per se*, presenting various peculiarities of its own (*e. g. M. niger*, *nemestrinus*, *silenus*, *rhesus*, *cynomolgus*, *radiatus* with *sinicus*, and perhaps others with which I am less familiar): and I certainly much prefer the currently adopted system of restricting *Cercopithecus* to the numerous African species which want the fifth tubercle to the last inferior molar, and follow Mr. Martin in appropriating the name *Cercocebus* to those other long-tailed African species which are known as the *Mangabeys*, or white-eyelid monkeys, of which three have now been ascertained,—an arrangement which has the advantage of according with the geographical distribution of these animals, and by which, too, any of them may be classified at a glance at their exterior, by those who are familiar with the subject.†

M. cynomolgus (?) Though possessing living examples of both the *M. nemestrinus* and *M. cynomolgus*, I have found great difficulty in determining the skins sent by Capt. Phayre, which I refer to these species, in consequence of the mode of preparation of them, the skulls having been taken out, and the faces irreparably injured; but after full consideration, I feel confident that the present one is correctly assigned, if not the other also. A pair of skulls of this are sent, from which the following dimensions are taken. That of an adult male measures four inches and three-quarters in total length, inclusive of the protruding incisor-teeth; greatest breadth (of *zygomæ*) three inches; vertical height (including lower jaw) three inches and one-eighth; length of bony palate an inch and seven-eighths; breadth of ditto three quarters of an inch. The corresponding measurements of a female

* Mentioned in the *Report on British Fossil Mammalia*, published in the "Report of the British Association" for 1842, p. 55.

† If I mistake not, the tail is in *Cercopithecus* and *Cercocebus* of constant proportional length, being much longer than in any *Macacus*.

skull are—four inches and three-quarters, two and seven-eighths, three inches, one and five-eighths, and nearly three quarters of an inch. The upper canines of the male project nearly five-eighths of an inch from the bony socket. Capt. Phayre sent the following note respecting the habits of this animal. "These monkeys frequent the banks of salt-water creeks, and devour shell-fish. In the cheek-pouch of the female were found the claws and body of a crab": accordingly, there can be little hesitation in identifying it with the other species of Dr. Helfer, to which the same habits were assigned.

Of the species of this genus, one only appears to inhabit Bengal, the *M. rhesus*, which is numerous in the Soonderbuns, where its habits I suspect pretty much resemble those of *M. cynomolgus:* it frequents thick jungly situations, particularly about the borders of narrow gullies, and to escape pursuit will sometimes plunge into the water from an overhanging tree, swim to some distance beneath the surface, and then land and make off on the opposite bank. The Hoonuman, on the contrary, would appear never to enter the water. The *M. rhesus* also occurs, as we have seen, even on the Himalaya so far westward as Simla, and Mr. Hodgson has sent it from Nepal, where I cannot help suspecting that (in different phases,) it constitutes both his *M. oinops* and *M. pelops*, *J. A. S. IX*, 1213; and it is included in Dr. Walker's list of the mammalia of Assam, (*Calc. Journ. Nat. Hist. II*, 265,) together with another species discovered in that part by Dr. McClelland, and described as *M. assamensis* in *Proc. Zool. Soc.* 1839, p. 148. Still further to the N. W., "Monkeys" are stated by Elphinstone to be found only in the north-eastern part of Affghanistan: but no *Simiadæ* are included in an elaborate paper on the mammalia of that country, prepared by Capt. Thos. Hutton for publication in this Journal, nor have I seen any subsequent notice of their occurrence in that vicinity. In the Indian peninsula generally, the common species of *Macacus* is the *M. radiatus*, being the only one included in the catalogues of Messrs. Sykes and Elliot; but *M. sinicus* is likewise found in the southernmost part and in Ceylon, as is also the *M. silenus*.

The following is a brief synopsis of the Indian species of *Simiadæ*, with those of Assam, Arracan, and the Tenasserim provinces, as far as they are at present ascertained:—

1. *Hylobates syndactylus ; Simia syndactyla,* Raffles. Stated by Helfer to extend as high as 15° N. Lat.

2. *H. lar.* Common in the Tenasserim provinces, and extending northward into Arracan, and southward to the Straits.

3. *H. hoolock.* Hill ranges of Assam, Sylhet, and Arracan.

4. *Semnopithecus entellus,* F. Cuv. Separate, apart, wider Bengal and Assam ; Cuttack ?

5. *S. anchises,* Elliot. Central table land of the Indian peninsula, and base of the western ghauts.

6. *S. schistaceus,* Hodgson. Nepal: the species of the western Himalaya perhaps different.

7. *S. priam,* Elliot. Coromandel coast.

8. *S. hypoleucos,* Nobis. Travancore and Malabar range.

9. *S. pileatus,* Nobis. Tipperah and Chittagong hills ; Naga range.

10. *S. cephalopterus,* (Zimmerman). Ceylon and Neilgherries.

11. *S. obscurus,* Reid. (*S. cristatus ?* Raffles.) Arracan, Tenasserim, extending southward to the Straits, and probably Sumatra.*

12. *Macacus silenus.* Ceylon, and neighbouring districts of the continent of India.

13. *M. nemestrinus (?)* Arracan, Tenasserim.

14. *M. rhesus.* Bengal, Assam, Nepal, Simla.

15. *M. assamensis.* Assam.

16. *M. cynomolgus (?)* Arracan, Tenasserim.

17. *M. radiatus.* Peninsula of India.

18. *M. sinicus.* Southernmost part of ditto, and Ceylon.†

Although I have here followed the usual order of classifying these three groups, I am nevertheless of opinion that the division comprising the *Cyncoephali, Macaci,* and *Cercopitheci,* (*i. e.* the genera with cheek-pouches,) should precede that of the *Semnopitheci* and *Colobi* (or the genera with sacculated stomachs). The facial angle can no longer be considered as a guide to the relative elevation of these animals in the scale of being, now that the adult Orangs, for example,

* The *Semn. (*or *Presbytis) nobilis,* Gray, *Ann. and Mag. Nat. Hist.* 1842, p. 256, I cannot but regard as requiring confirmation as an inhabitant of India proper.

† This is doubtless the species noticed by Mrs. Graham in Ceylon, where that lady mentions "Swarms of red Monkeys playing in the trees overhead." (Journal of a Residence in India', p. 104.) I have reason to conclude also that this, and not the Lungoor, is the *Rollewai* of the Singhalese.

are known to present so very prominent a muzzle, while, on the other hand, the lowest of all the *Simiadæ*, or the American Marmozets, have the same so inconsiderably developed; and it would seem that some trivial resemblance which the Semnotes bear to the Gibbons is now the chief inducement that occasions the former to be still placed next to the group of tail-less Apes, and thus to precede the third great division of old world Monkeys and Baboons, which is characterized by possessing cheek-pouches. But this third division unquestionably presents a nearer structural approach to the first than does the second; and, so far as I have observed, the intellect is also decidedly of a superior grade. I have next to describe an apparently new species of the African genus *Cercopithecus*.

Cercopithecus chrysurus, Nobis. This belongs to the particular minor group exemplified by *C. sabæus*, and would seem to be nearly allied both to that species and to the *C. tantalus*, Ogilby, *P. Z. S.* 1841, p. 33, the tail of which is stated in the Latin diagnosis to be yellow at tip, while in the more detailed vernacular description this is said to be "brown at the base, light grey at the tip." In the species now described, the terminal third of the tail is bright yellowish-ferruginous, as I believe in *C. sabæus*. The specimen is a male, and measures about nineteen inches from forehead to base of tail, the tail about twenty-four inches; from elbow to tip of hand nine inches, knee to heel seven and a quarter, and foot five inches. Colour grizzled yellowish-brown, the hair fine and soft at base, with the terminal half comparatively coarse and rigid, and broadly annulated first with black, then fulvous, and finally tipped with black; for the most part about two inches and a quarter long, but exceeding three inches on the sides towards the flanks: the whiskers, with the entire under-parts and inside of the limbs, are dingy yellowish-white: the fore-arm and leg greyer, or less yellowish than the parts above; and the hands and feet infuscated. Face almost naked, having only a few scattered hairs; but a narrow supercilium of long black hairs across the brow. The upper surface of the tail is rather darker than the back for the first two-thirds of its length, and then passes into bright yellowish-ferruginous, which on the under surface of the tail is continued nearly to its base, weakening however in intensity; the extreme tip of the tail is wanting in the specimen.

Length of the skull four inches and a half, and breadth across the *zygomæ* two inches and three-quarters; vertical height two inches and five-eighths; length of bony palate an inch and a half, and breadth seven-eighths of an inch. Habitat unknown.

Lemuridæ. The *Stenops gracilis* is usually assigned to Ceylon, and the *Nycticebus tardigradus* to Bengal. The latter, however, certainly does not occur in the lower part of Bengal, but may perhaps exist in the hilly regions. Dr. Walker includes it in his catalogue of Assamese Mammalia; and upon referring to the late Dr. Buchanan Hamilton's MSS., I find what I consider to mean this species, noticed as occurring in Chittagong, where it is said to be rare and solitary, inhabiting trees: in Rungpore, also, very scarce, and said to have been seen in the hilly countries to the south and east of the Boorhampooter by some natives, who recognised it by the Hindustanee name *Shiriminda Billi;* "bashful or shame-faced Cat," a name which I have also heard applied to it. The unobtrusive, nocturnal habits of this animal would, however, always cause it to be little observed. I believe that it is "the little *Bradypus*" of Dr. Helfer's 'Note on the Animal productions of the Tenasserim provinces,' being commonly designated "Sloth" by Europeans: and the territories eastward of the Bay constitute, I suspect, its chief habitat. A pair of the *Stenops gracilis* were offered to me in the Madras bazar, at the low price of a rupee; but I have seen no notice of this species as an ascertained inhabitant of the peninsula.* Here, in Calcutta, a dealer would ask at least ten rupees for a pair either of them or of the *Nycticebus*, and in all probability double as much.† They are, indeed, but seldom brought for sale in this emporium: and it is probable that the *Nycticebus*, if found at all in Bengal, occurs sparingly only a little within the confines of the province.

Vespertilionidæ.—The only Bat contained among Dr. Helfer's Tenasserim specimens was *Pteropus javanicus*, which, with *Nycticejus Temminckii*, he stated to be "amongst the rarer species found in the provinces"; and he alludes vaguely to other species of *Pteropus*, *Phyllostomus* (meaning probably *Megaderma*), and *Nyctinomus* (or

* It is included in Mr. Elliot's new catalogue of the mammalia of peninsular India.

† A pair of the *Stenops* said to have been brought from *Singapore*, have just been put up at auction at 60 Rupees! The *Nycticebus* is common in Arracan.

Dysopes). The Society has received *Pt. medius* (vel *Edwardsii*, Desm., apud Ogilby and others, though Edwards's specimen was from the Mauritius, and should therefore, I suspect, be the *Pt. edulis*,*) from Arracan, Tipperah, and Assam, where I cannot help considering the *Pt. assamensis* described by Messrs. McClelland and Horsfield to present merely an individual variation, The same appears to be Dr. Walker's opinion, as *Pt. Edwardsii* alone is included in his list of Assamese mammalia. Mr. Hodgson has also sent it from Nepal as his *Pt. leucocephalus* (*J. A. S.* IV, 700), together with the *Cynopterus marginatus* as his *Pt. pyrivorus* (ibid.), which latter has likewise been received by the Society from Assam and Arracan, and both of these species appear to be common throughout India; the former also doubtless constituting the large "Flying Fox" so abundant in the Maldives and Laccadives. The third Indian species of frugivorous Bat, *Pt. Dussumieri*, (of which a description will be found in XII, 176,) is still wanting to the Society's collection.

Of *Cynopterus marginatus*, I have been keeping three live females for several weeks. They are exclusively frugivorous, and take no notice of the buzz of an insect held to them; which I remark in reference to a statement of Mr. Gray, that the nearly allied little Kiodote is partly insectivorous: this I doubt very much. The *Cynopterus* is a very ravenous eater, and will devour more than its own weight at a meal, voiding its food but little changed as excrement, while still slowly munching away. Of guava it swallows the juice only (though a soft mellow fruit), opening and closing its jaws very leisurely in the act of mastication, and rejecting the residue. The flight of this Bat is particularly light and buoyant, far different from the measured rowing, the direct and heavy flight of the large *Pteropus*; but the general manners and the voice of the two are very similar.†

The other Indian *Vespertilionidæ* fall into three principal groups; viz

* The Mauritius species is styled *Pt. vulgaris*, v. *rubricollis*, Geoff., in *P. Z. S.* 1831, p. 45.

† After a while, the three caged females mentioned above attracted a male, who used to be continually hovering about their cage of an evening, and at length took up his diurnal residence hitching to a rafter above a dark staircase close by, where one of the females who escaped immediately joined him, and they continued to retreat there regularly for some days, when both were caught.

—*Rhinolophinæ*, comprising the genera *Megaderma*, *Rhinolophus* and *Hipposideros*, and *Nycteris* (which at least is a Malayan genus),—*Dysopodinæ*, including *Dysopes*, (with its various subdivisions, as *Cheiromeles*, &c.,) *Taphozous*, and *Rhinopoma*,—and *Vespertilioninæ*, or the ordinary Bats.

The *Megaderma lyra* appears to be a common species throughout India, and I have described its habit of preying on smaller Bats, first sucking their blood, in XI, 255. In reference to that paper, Mr. Frith informs me that a number of these Bats were in the habit of resorting to the verandah of his residence in Mymunseng, and that every morning the ground under them was strewed with the hind-quarters of frogs, and the wings of large grasshoppers and crickets: on one occasion the remains of a small fish were observed; but frogs appeared to constitute their chief diet—never toads: and of a quiet evening these animals could be distinctly heard crunching the heads and smaller bones of their victims. Other species of Bats were noticed to keep aloof from this retreat, but Mr. Frith had no opportunity of confirming my observation that the *Megaderma* preys upon smaller animals of its tribe. The disproportion of the sexes in the assemblages of this species in their diurnal retreats is noticed in XI, 600; and indeed I think that the same pretty nearly holds throughout the family. In Mr. Elliot's catalogue, the name *carnatica* is proposed, with a mark of doubt, for the *Megaderma* of S. India, which however is perfectly identical with that of Calcutta.

Rhinolophus, Geoff. and Cuv. In preparing a notice of the Indian species of this difficult genus, so far as I am acquainted with them, I labour under the considerable disadvantage of not having M. Temminck's valuable monograph to refer to; but I will nevertheless endeavour to review the history of the group, so far as the means at my disposal will permit of. The first endeavour at collating the species would appear to be that of M. Geoffroy St. Hilaire, in the 'Annales du Museum,' tom. XX, pp. 254 *et seq.* (1813). Four species are there noticed, in addition to the two common in Europe*; and among the former is a species from Timor, the *Rhinolophe crumènifère* of M.

* A third European species, found towards the South (in Dalmatia, Sicily, &c.,) also in the Levantine countries, and it would appear all Africa, is the *Rh. capensis*, Licht., *Rh. clivosus*, Rupp., v. *Rh. Geoffroyi*, A. Smith.

M. Péron and Lesueur, which I conceive to be erroneously identified with the *Vespertilio speoris* of Schneider, described to inhabit India, as it differs from the latter in its considerably larger size, and (it would seem) more rufous colouring.

In the second edition of Cuvier's 'Regne Animal' (dated 1829), these six species only are referred to: but Dr. Horsfield, in his 'Zoological Researches in Java' (dated 1824), had described seven (alleged) species as inhabitants of that island, two of which have since been brought together by Mr. Gray, after an examination of the original specimens collected by Dr. Horsfield,—*Rh. deformis*, Horsfield, being thus identified with *Rh. insignis*, Horsfield.

Then followed M. Temminck's Monograph of the genus, wherein (if I remember rightly) several species were added to those of his predecessors; of which, among perhaps others unnoticed in Mr. Gray's subsequent synopsis, I find mentioned by authors a *Rh. luctus*, Tem., from Java, an alleged rufous variety of which is described in the Zoology of the Voyage of *la Favorite*, from Manilla,—also a *Rh. pusillus*, from India, which appellation is referred with a mark of doubt to a specimen in the Zoological Society's Museum, in Mr. Waterhouse's Catalogue of the mammalia preserved in that collection,—where also is mentioned, but likewise with a mark of doubt, *Rh. insignis*, Horsf., from Ceylon.

Confining ourselves now to the describers of Asiatic species*, Col. Sykes, in the Proceedings of the Zoological Society for 1831, describes a *Rh. dukhunensis*, distinguishing this from the *Rhinolophe crumènifère* of Péron and Lesueur, which, it is added, is the *Rhin. marsupialis* of M. Geoffroy's lectures, and the *Rh. speoris* of M. Desmarest, by its much smaller size, &c.; but this smaller size corresponds with the original description of *Vesp. speoris* from India, the colour of which is however stated to be "pale yellowish ash-brown" (apud Shaw), which does not apply well to either, though better to that of India: and I have little doubt that Col. Sykes's species is the true *speoris*, to which *dukhunensis* would therefore be referred as a synonym, as likewise the subsequent names *apiculatus*, Gray, for the male, and *penicillatus*, Gray, for the female.

* The form is peculiar to the Old World, inclusive however of Australia (apud J. E. Gray).

Mr. Hodgson, in the Society's Journal for 1835, next described a *Rh. armiger* and *Rh. tragatus* from Nepal; but the former of these appears to be identical with the Javanese *Rh. nobilis* of Horsfield. The same naturalist more recently obtained three other species from that province, and has described one of them by the name *perniger*, in *J. A. S.* XII, 414; but I suspect that this is identical with *Rh. luctus* of Temminck.

We now come to Mr. Gray's "Revision of the genera of Bats, and descriptions of some new genera and species," published in the 'Magazine of Zoology and Botany,' No. XII. In this paper the *Rh. vulgaris*, Horsf., is mentioned as inhabiting India, and besides the *Rh. apiculatus* and *Rh. penicillatus*, Gray, both of which I have referred to *speoris* verus v. *dukhunensis* of Sykes, two other species from India are described as new, from specimens procured by Walter Elliot, Esq., Madras C. S., and these are also given in the latter gentleman's valuable "Catalogue of the Mammalia of the Southern Mahratta country," published in the 'Madras Journal of Literature and Science,' No. XXIV, pp. 98-9, one of them however by a different and more appropriate name.

Such appears to be the amount of information hitherto published relative to the Indian *Rhinolophi*, which I shall now proceed to reduce and classify, and enrich by the addition of several new species.

The various Indian and Malayan members of this group fall into two marked divisions, corresponding to *Rhinolophus*, Gray, as restricted, (the *Noctilio*, apud Bechstein, according to Mr. Gray,) and the *Hipposideros*, Gray, v. *Phyllorhina*, Bonap., apud Gray.

The former is exemplified by the three European species, and by the Javanese *Rh. affinis* and *Rh. minor*, Horsf., in addition to which only two species are indicated by Mr. Gray, the *Rh. megaphyllus*, Gray, (*P. Z. S.* 1834, p. 52,) from Australia, and *Rh. griseus*, Meyer, habitat not ascertained. In this group, the facial crests are more prominently developed, and terminate in an angular peak above, within and anterior to which is a second leaf of membrane, in general also peaked, and attached behind by a vertical (*i. e.* longitudinally disposed) connecting membrane, which last is sometimes developed beyond the lesser transverse leaf, in front of it, and each undergoes considerable modification in the various species: the nasal apertures appear linear,

from being partly overlapped by membrane, which lines and surrounds the centre of the facial depression, between the latter and the nostrils; outside of the nostrils the face is bordered by a layer of membrane surrounding it in front in shape of a horse-shoe. The ears in this group are large, ample, and apiculated, having the point directed outward, and (as Mr. Hodgson remarks of the *Rhinolophi* generally,) are "tremblingly alive all over:" the conch is continued round in front to form an anti-helix, which is separated apart by an emargination, sometimes very deep, but should not be confounded (as it occasionally has been) with the *tragus* of various other Bats. As many as six species inhabit India, all of which (unless *Rh. pusillus* be among them) seem different from those heretofore described.

The first is remarkable for having a conspicuous transverse leaflet with a septum behind and above it, situate upon the larger or posterior peaked membrane, and considerably above the lesser or anterior one; but this is only a modification and development of what is more or less observable in the others. The posterior peak reaches to between the ears and even beyond.

1. *Rh. mitratus*, Nobis. Length four inches, of which the tail measures an inch and a half; of another specimen three inches and one-eighth, the tail an inch and a quarter. Expanse (of the former) probably twelve inches; length of fore-arm respectively two and a quarter, and two and one-eighth; of longest finger three and one-eighth, and three inches; of tibia an inch; and tarse with claws half an inch. Ears large and ample, measuring an inch to point anteriorly, the anti-helix moderately developed, but separated apart by only a slight emargination. Fur of the upper-parts a rich light brown, paler at base, excessively soft and delicate, and rather long; of the under-parts shorter and much paler. Anterior nose-leaf subovate, or nearly rounded, contracted at base, and a conspicuous lappet of membrane is given off from each side of the centre of the facial depression, overhanging the nostrils, and forming a round mesial cup; vertical membrane posterior to the lesser nose-leaf little developed, and supporting its base only; the uppermost or hindmost peak triangular and acute at tip, reaching beyond the base of the ears between the two, and divided by a mesial septum, but little overlapped at base by a second small transverse lamina which occurs also in most of the other species, and is placed

beyond and above the vertical membrane which supports the inner or anterior nose-leaf. This fine species was procured by Capt. Tickell in the neighbourhood of Chyebassa, in Central India.

2. *Rh. perniger*, Hodgson, *J. A. S.* XII, 414.* Distinguished by its large size, and delicately soft and long, curly, blackish fur, having a slight ashy cast from the hairs being thus tipped. A fine specimen which I saw in Dr. Griffith's possession, from Cherra-Poonjee (Sylhet), and which has since been forwarded by him to the museum of the Hon'ble Company in London, measured five inches from muzzle to extremity of foot. The only example now before me is too much injured about the head to permit of a description being taken of the peculiarities of its facial membranes; and Mr. Hodgson's account, excepting as regards size and colouring, applies, for the most part, to the species generally of the present subgroup. The length of the fore-arm in the latter specimen (which was presented to the Society by Mr. Hodgson,) is two inches and three-quarters, and of tibia an inch and three-eighths. Inhabits the central region of the sub-Himalayas.

3. *Rh. tragatus*,† Hodgson, *J. A. S.* IV, 699. This species was so named in reference to the development of its anti-helix, as compared with the very slight indication of one traceable in *Hipposideros armiger* (v. *nobilis ?*); but the appellation is far from being felicitous, as the anti-helix (not tragus, as indeed was duly pointed out by Mr. Hodgson,) is less developed than is usual in the present subgroup. Mr. Hodgson described this Bat to be "uniform deep brown, with the tips paler and rusty;" but two of three specimens sent by him are certainly of a light brown, and one of them, more particularly, has the upper parts tipped with dull maronne, which produces a general shade

* Probably the *Rh. luctus*, Tem., of which I can get at no description, though Mr. Gray alludes to it as stated to be black with an ashy tinge; vide 'Annals and Magazine of Natural History' for 1842, p. 257, where Mr. Gray describes a *Rh. morio* from Malacca, Singapore. "The front central lobe of the nose-leaf large, three-lobed; fur reddish-brown. Very like *Rh. luctus* in general appearance, and perhaps the colour may have changed by the specimen having been taken from spirits." Why therefore impose a new name, or at any rate why not put a mark of doubt after the word *morio*, and add *Rh. luctus*, Tem., var.? Most probably this is the *Rh. luctus*, Tem., var. *rufus*, from Manilla, of MM. Eydoux and Gervais, in the Zoology of the Voyage of *la Favorite*.—*Rh. luctus* is described from Java.

† Misprinted *torquatus* in Mr. Gray's "Revision."

of this colour, as in several other species both of *Rhinolophus* and *Hipposideros*. The central nose-leaf is small and narrow, and a little expanded at the summit; the nasal orifices are fringed externally with a lappet of membrane; and the uppermost peak of the membrane, above the nose-leaf, is inconspicuous, being almost concealed by the fur of the forehead. Length of fore-arm two inches and a quarter, and of tibia an inch and one-sixteenth. Inhabits the central region of Nepal.

4. *Rh. macrotis*, Hodgson, *MS.* This and the two succeeding species are of small size, and one of them may perhaps be the doubtfully cited *Rh. pusillus* of Mr. Waterhouse. In that now under consideration, the anterior nose-leaf approaches in form to that of *Rh. tragatus*, but is proportionally larger and wider, nearly twice as long as broad, and rounded without expanding at the summit, which is scarcely so high as the pointed tip of the posterior vertical membrane that connects the nose-leaf with the face; behind or above this again, are three successive lappets of membrane, the first of them incomplete, and the last or hindmost peak is obtusely pointed: the nareal orifices are oblong, or rather kidney-shaped, with no lappet of membrane bordering their outer side, but the usual horse-shoe-shaped development overhangs the upper lip. Mr. Hodgson describes the species as follows:—"General structure typical? No pubic teats. Distinguished by the large size of the ears, which are longer than the head, broad, oval, with pointed recurved tips, and large obtusely rounded-second ears [anti-helix]. Colour sooty-brown, much paler and dusky-hoary below.* Snout to base of tail an inch and three-quarters; head three-quarters of an inch: ears from anteal base fifteen-sixteenths of an inch; interval of ears a quarter of an inch: tail three-quarters of an inch, completely enveloped in the square membrane: arm an inch; fore-arm an inch and a half; longest or second finger two inches and five-sixteenths: femur eleven-sixteenths; tibia the same; expanse nine and three-quarters; weight one-third of an ounce. Habitat Nepal." The following are the dimensions of one of the

* This description does not apply, however, to the specimens with which Mr. Hodgson has favored the Society, and which are of a light earthy olive-brown (one of them verging on isabelline), and paler below.

specimens presented to the Society by Mr. Hodgson. From muzzle to base of tail an inch and five-eighths, the tail exceeding five-eighths; ears anteally five-eighths; fore-arm an inch and five-eighths; longest finger two inches and a quarter; tibia exceeding five-eighths of an inch; and foot with claws three-eighths.

5. *Rh. subbadius*, Hodgson, MS.; mentioned as *Vespertilio subbadius*, H., in *J. A. S.*, X., 908. In this species, the anterior nose-leaf is very small, oblong, and rounded above, but the vertical membrane behind it is conspicuously developed, and pointed posteriorly; behind this again, is a short and broad transverse membrane, divided into two lateral lobes, and as usual some long straight hairs grow from this part; and lastly, there is the hindmost angular peak, the sides of which are slightly emarginated towards the point: the nostrils are not externally fringed with membrane; and over the lip is the usual horse-shoe. Mr. Hodgson thus describes the species:—"No pubic teats. Ears no longer than head, truncated at tip [or rather, they are somewhat obtusely pointed], ovoid. Nasal appendage quadrate, not salient, with a transverse bar nearly surmounting it towards the head. Colour a medial clear brown, paler below, and especially on the head and face. Snout to vent an inch and a half; tail an inch and a quarter; head five-eighths of an inch; ears the same; expanse seven and a half: fore-arm an inch and a quarter; longest finger two and a quarter; the foot and nails three-eighths of an inch. Habitat Nepal." The admeasurements of a specimen presented by Mr. Hodgson are —muzzle to vent an inch and a quarter; tail five-eighths of an inch; head the same; ears anteally half an inch; fore-arm an inch and three-eighths; longest finger one and seven-eighths; tibia nearly five-eighths of an inch; foot and nails five-sixteenths of an inch. Inhabits Nepal.

6. *Rh. lepidus*, Nobis. A good deal allied to the last, but distinguished by its much paler colour, longer fore-arm, and especially by the uppermost and hindmost peak of the facial membranes being much less evenly angular, having its sides so considerably emarginated towards the tip, that the latter appears as a narrow terminal prolongation, one-sixteenth of an inch in length; the vertical membrane posterior to and adjoining the anterior nose-leaf is also still more developed and

obtusely angulated behind; and there is a slight fold of membrane exterior to the nostrils. Ears large, and of the usual form, measuring nearly five-eighths of an inch from anteal base to tip, and having a well developed anti-helix. General hue pale isabella-brown, the fur of the upper parts tinged with dull maronne towards the tips, imparting a shade of that colour; under-parts still lighter, and the fur shorter: membranes apparently dark. Length an inch and three-quarters; of tail half an inch more; and extent about nine inches: fore-arm an inch and five-eighths, longest finger two and a quarter, and tibia above five-eighths of an inch. The specimen (in spirits), and an injured skin of apparently the same species, were both probably obtained in the vicinity of Calcutta.

Hipposideros, Gray. This seems a perfectly distinct group, characterized by a totally different form of facial crest from that observable in the preceding series. The general form of this is quadrate, surmounted by a short and broad transverse membrane recurved along the edge, and over this, in the males (I suspect always,) is a round sinus or cavity with a transverse semicircular opening. "This cavity," remarks Mr. Elliot, "the animal can turn out at pleasure, like the finger of a glove; it is lined with a pencil of stiff hairs, and secretes a yellow substance like wax. When alarmed, the animal opens this cavity and blows it out, during which it is protruded and withdrawn at each breathing. Temminck notices it under the name of a syphon, or purse, in *Rh. insignis* and *Rh. speoris*" (apud Geoffroy)*. The entire facial crest has been well compared by Mr. Hodgson to "a coat of arms, with double field"; the superior and inferior fields separated by a trilobate fleshy ridge, below which are situate the nostrils in a deep cavity, surrounded by the membrane which forms the lower field, both within and exterior to which are, in some species, additional laminæ of membrane. The ears in this group are, in general, less apiculated, and sometimes rounded, and the conch is not continued round to form an anti-helix.

* It is probable that the development of this sinus, and also of the throat-sac of the *Taphozoi*, depends much on season, like the infra-orbital cavities of various ruminants and analogous glandulous follicles in many other animals.

Some have a more complex membrane surrounding the nostrils, and three small lateral fringes of membrane exterior to the nose-leaf.

1. *H. armiger*, (Hodgson), *J. A. S.* IV, 699. Very closely allied to, if not identical with, *H. nobilis*, (Horsfield). I cannot, however, perceive that "the hairs of the axilla, hypochondria, and scapular marks, are nearly white," as stated of the Javanese species. Colour uniform light brown, with dark maronne tips to the fur of the upper-parts. Length of fore-arm (of a large specimen) three inches and five-eighths, and of tibia an inch and a half. Inhabits the central region of Nepal.

2. *H. larvatus*, (? Horsfield). A species which I have little hesitation in identifying with this, has the fur of a brighter ferruginous than is represented in Dr. Horsfield's two figures, and the under-parts more particularly are much deeper-coloured than would appear from the second figure of the plate adverted to. The fur of the upper-parts is vivid fulvous, more or less tinged with maronne upon the back, and weaker towards the base of the hairs; that of the under-parts being somewhat less intense: membranes dusky, but it would seem tinged with the prevalent hue of the fur. Length about four inches, of which the tail measures one and a quarter: fore-arm two inches and a half; longest finger three and a quarter; tibia an inch and one-sixteenth; foot with claws five-eighths of an inch: ears angulated, measuring anteally seven-eighths of an inch to tip, and three-quarters of an inch broad, length of head an inch. Both in this species and the last there is a minute false molar anterior to the carnassier in the upper jaw, which appears to be wanting in those which follow. Inhabits Arracan, whence forwarded to the Society's Museum by Capt. Phayre, to whom we are likewise indebted for the next species.

3. *H. vulgaris*, (? Horsfield); a species mentioned by Mr. Gray as inhabiting India. It differs from the last in being rather smaller, and of a brown colour above, much paler at the base of the hairs and at their extreme tips; and lighter-coloured below: the ears more apiculated, or rather they appear so from being strongly emarginated externally towards the tip: the tail and interfemoral membrane would likewise seem to be shorter, but the latter has been withdrawn from

the skin in the dry specimen before me, which, as before mentioned, was received from Arracan. Length of fore-arm two inches and a quarter, and of tibia an inch; ears anteally three-quarters of an inch, and nearly as much broad.

4. *H. speoris: Vesp. speoris,* Schneider, but evidently not of M. Desmarest, which is *Rh. marsupialis* of M. Geoffroy's lectures, founded on the *Rhinolophe crumenifére* of Lesson and Lesueur: *Rh. Dukkunensis,* Sykes, *P. Z. S.* 1831, p. 99: *H. apiculatus,* Gray, the male, and *H. penicillatus,* Gray, the female, *Mag. Zool. and Bot.* No. XII. For description, vide Elliot, in *Madras Jl.* No. XXIV, 98. Colour nearly as in *H. armiger (v. nobilis?):* length of fore-arm two inches, and of tibia an inch. Inhabits Southern India.

This species is approximated to *H. insignis,* (Horsf.,) in Mr. Gray's paper, and it may be the doubtfully cited *H. insignis* from Ceylon of Mr. Waterhouse's Catalogue of the Mammalia in the Zoological Society's Museum.

Others have the facial crests altogether less complicated, and no fringes of membrane exterior to the nose-leaf.

5. *H. fulvus,* Gray, *Mag. Zool. and Bot.,* No. XII; *Rh. fulgens,* Elliot, *Madras. Jl.,* No. XXIV, 99. This is perhaps the most vividly coloured of the whole class of Mammalia; at least I know of no species which can at all compete with it for brilliancy of hue. The colour of the fur is here alluded to, for that of the naked skin of the Mandrill and of certain *Cercopitheci* can scarcely be surpassed. The general tint of the fur is splendidly bright ferruginous, that of the upper-parts being slightly tipped with a darker shade; membranes dusky. Length, according to Mr. Elliot, an inch and nine-tenths, of tail nine-tenths of an inch; expanse ten inches and a half: weight 4 dr. 20 gr.: fore-arm an inch and five-eighths; longest finger one and a half; tibia three-quarters of an inch; foot (minus claws) a quarter of an inch: ears anteally eleven-sixteenths of an inch, and the same across; their form scarcely apiculated. Inhabits Southern India, where very rare.

6. *H. murinus,* Gray, ibid.; *Rh. murinus,* Elliot, ibid. This I have not yet seen, but shortly expect some specimens from Mr. Jerdon, who informs me that it is common at Nellore. It closely resembles the

last in all but colour, but has the crest-membranes still less developed. Colour dusky-brown, paler beneath. Inhabits Southern India.

Taphozous. Three new species of this genus have been described by me in *J. A. S.*, X, 971 *et. seq.*; and in XI, 784, I verified and gave a more detailed notice of the *T. longimanus*, Hardw., *Lin. Tr.* XIV, 525, and distinguished the species which I had previously referred with doubt to *T. longimanus*, by the appellation *T. Cantori.* This last mentioned Bat I have not again obtained in the neighbourhood of Calcutta, but have received a specimen from Mr. Jerdon, procured in the vicinity of Nellore (on the Coromandel coast), where it would appear to be not uncommon. This species is easily recognized by its flatly out-lying ears, recurved tail, little developed gular sac, and by the whiteness of the base of its fur, which shews conspicuously.

Another species from Southern India is my *T. brevicaudus*, which is at once distinguished from all the other known species by the shortness of its tail and interfemoral membrane. The specimen was from Travancore.

Since my description of *T. longimanus* was published, I have had several fresh specimens, and very recently obtained thirteen alive (of which two only were males) from the interval between a pillar and the wall against which it was placed. Five others escaped. These Bats clung with perfect facility to the smooth mahogany back of a cage into which they were put, hitching their claws in the minute pores of the wood, and creeping upon it in a manner that was surprising. The females were each about to give birth to a single offspring (early in August). Their size was remarkably uniform, both sexes measuring four inches and a quarter from snout to tail-tip, by sixteen and a quarter in alar expanse; the tail protruding half an inch: nostril not closed, but having a valvular kidney-shaped orifice, and tremulous, as observable in various other Bats, (for instance, the *Cynopterus marginatus.*) The variation in colour was not great, nor had it any relation to sex; but one or two were more hoary-tipped, imparting an ashy appearance, and one only was marked with yellowish or fulvescent.

I have also procured in this vicinity specimens of my *T. fulvidus*, and supply the following description of a recent male that was shot early one

morning, in bright day-light, creeping upon the stem of a palm. Length, to end of tail, four inches, the membrane extending three-quarters of an inch further; tail seven-eighths of an inch, and (as usual) wholly retractile within the membrane; alar expanse fifteen inches; length of fore-arm two and three-eighths; tarse an inch; foot and claws half an inch. General colour slightly grizzled chesnut-brown, purer on head and neck, the abdominal region covered with shorter hair, weakly infuscated, and less tinged with chesnut; axillary part of the membrane, from between the elbow to the flank inclusive, covered with longer and whitish hairs. Face, ears, and membrane, washed with dusky; the portion of membrane between the hind-leg and proximate finger narrowly edged with whitish. One specimen purchased of a bazar shikarree is so much darker, that before I had obtained a good series of *T. longimanus* I had some doubt whether it ought not to be referred to that species; and such an example may have been the original *longimanus* of Hardwicke, described as of a snuff-brown colour: but this name had better now remain as I have appropriated it. In general, the present species is of a tolerably bright chesnut hue. Like the preceding one (to which it is closely allied), the male has a very large throat-sac, the ears bend upwards, and the tail is straight and rigid, not recurved as in *T. Cantori*, and also as in the following species. The specimens which I formerly described had been long soaked in spirit, which seems to have discharged the colour from the face and membranes, and one of them which I have had taken out and stuffed, has the under-parts more uniformly coloured, the longer hair upon the membrane towards the axilla, and that of the abdomen, scarcely differing in hue from that of the breast; whereas in the recently procured examples here described, the difference of colour in these parts is very conspicuous.

T. crassus, Nobis. This is a well marked species, having the recurved tail of *T. Cantori*, and ears bending upwards as in *longimanus* and *fulvidus*. It is particularly distinguished by its blackish colour, and the broad dull white margin of the membrane between the tibia and proximate finger, this margin increasing much in depth as it recedes from the finger-tip, and merging gradually into the black of the rest of the membrane, becoming at first mottled with the latter.

Length to end of tail four inches, the membrane reaching five-eighths of an inch beyond; tail three-quarters of an inch, the terminal five-sixteenths protrusile and recurved: expanse fifteen inches and a half; fore-arm two and five-eighths; first phalanx of longest finger two and a half; tibia an inch; foot large, measuring with claws eleven-sixteenths of an inch: the sac little developed. Ears five-eighths of an inch apart at base anteriorly. Fur of the upper-parts black, or dark blackish-brown, a little hoary at the tips, and light brown at the extreme base; under-parts inclining to ashy-black, and more grizzled; membranes dusky, with the exception of the whitish margin described. On the particular specimen before me, are some pure white dashes on one side of the back, being traces of partial albinism. The nostrils appear to be quite closed by a valve, which would open at the will of the animal. Taken at Mirzapore, and presented to the Society by Major. R. Wroughton, to whom it is also indebted for examples of the *Rhinopoma*, and for numerous other interesting specimens.

T. pulcher, Elliot. A species from Southern India, recently discovered by Mr. Elliot, who informs me that it is "black-brown above with white pencillings, and pure white below." That naturalist will give a more detailed description of it in the Madras Journal.

Rhinopoma. From descriptions with which I have been favored, I had long felt satisfied that a Bat of this genus inhabited the renowned *taj* at Agra, where great numbers of them would seem to exist; and there can be little doubt that the species is that marked *Rh. Hardwickii*, Gray, from India, in Mr. Waterhouse's catalogue of the stuffed specimens of Mammalia in the Zoological Society's Museum, and also that likewise referred to *Hardwickii* in Mr. Elliot's catalogue of the Mammalia of the Southern Mahratta country, as being found in old ruins to the eastward of that province. But a specimen in the Society's collection received from England, and said to be African, differs in no respect that I can perceive, and comparing both with the figure of *Rh. microphylla* in the national French work on Egypt, the only difference arises from what I presume is an inaccuracy in that figure; viz. that the caudal vertebræ are not represented to be sufficiently elongated. Even on comparison of the skulls together, and with that figured by M. Geoffroy, I have been unable to detect any

diversity worthy of notice. The following description is drawn up from specimens received from Agra and Mirzapore. Entire length, (of a full grown male,) to end of the long slender tail, five inches and a half, the latter passing the membrane by two inches and a quarter; expanse twelve inches and a half: (length of a female five inches, by eleven inches in expanse:) fore-arm two inches and a quarter; longest finger two and three-quarters; tibia an inch and a quarter: foot with claws five-eighths of an inch; ears from base anteally seven-eighths of an inch, posteally half an inch, and width of the joined pair, from tip to tip, an inch and seven-sixteenths. Fur very fine and delicate, its general colour a soft dull brown, paler at base, where inclining towards albescent; the face, rump, and abdominal region naked, the skin of the rump corrugated, and together with the face and membranes dusky, having a tinge of plumbeous; the skin of the arms underneath, and of the belly and nates inferiorly, is transparent, the latter covering an enormous accumulation of fat, which above reaches over the loins and along the spine. Nostrils closed and valvular, forming obliquely transverse slits in the truncated muzzle: the claws conspicuously white.

Dysopes. I know of but one Indian species of this genus, which is the *Vespertilio plicatus* of Buchanan Hamilton, *Lin. Trans.* V, 261; the *Nyctinomus bengalensis* of M. Geoffroy; and I am inclined to regard the *D. murinus* of Hardwicke's published drawings as no other, indifferently represented. I was favored with a live specimen of this animal by Mr. Ridsdale, of Bishop's College Press, and lately obtained another which flew in at a window: Mr. Masters also has presented the Society with a stuffed one: all of these being much of a "snuff-brown" colour, the fur of the under-parts tipped paler: but there is an old specimen of what may perhaps be another species in the museum, the fur of which is remarkably close and velvety, and very dark fuliginous-brown above, with a shade of maronne, the under-parts similar but paler and somewhat reddish. So far as I can judge from the state of the specimen, it presents, however, no structural characters at variance with those of the other, that can warrant its being distinguished as a species; but I yet suspect that it

is a different species from the *plicatus*.* The affinity of this genus for *Taphozous* is very apparent in the living or recent specimens, the present group having even the same peculiar mode of folding the wings, which is not the case even with *Rhinopoma*, wherein there is merely a tendency or inclination to that particular mode of duplicature of the wings.

* It is probably the Malayan *D. tenuis*, v. *Nyctinomus tenuis*, Horsfield.