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JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL,

EDITED BY

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THE SECRETARY.

VOL. XV.

Nos 169 C. 173 v. Left..

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

CALCUTTA :

BISHOP'S COLLEGE PRESS.

1846.



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Proceedings of the Asiatic Society of Bengal, JANUARY, 1846.

The stated monthly meeting was held on Wednesday evening, the 7th of January, W. B. O'Shaughnessy, Esq., M. D., senior member of the Committee of Papers, in the chair.

The Proceedings for the month of December were read and confirmed.

The Secretary referred to what had passed at that meeting in reference to an Iron Railing, and it was resolved that the following gentlemen be nominated a committee to take this matter into consideration :

Captain Marshall, B. N. I.

W. Tayler, Esq. C. S.

R. Frith, Esq.

W. Elliot, Esq., Madras C. S. was balloted for and declared duly elected and the following new member was proposed :

Lord Arthur Hay.

Proposed by E. Blyth, Esq., seconded by R. Frith, Esq.

The following gentlemen were also elected as members of the committee of papers for 1846 :

G. A. Bushby, Esq. C. S.

J. R. Colvin, Esq. C. S.

W. Tayler, Esq. C. S.

The Secretary stated that, through the Rev. J. Long, Rájá Sreesh Chunder Bahadour of Nuddea had placed at the disposal of the Society for copying, a portrait of his ancestor the learned Rájá of Nuddea, which was in the hands of a competent artist. The thanks of the Society were voted by acclamation to the Rájá.

Read the following list of books, presented, exchanged, and purchased :

List of Books received for the Meeting of Wednesday, the 7th January, 1846.

PRESENTED.

1. The Calcutta Christian Observer for December, 1845, and January, 1846.—By the Editors.
2. The Oriental Christian Spectator for December, 1845.—By the Editor.
3. Sepulchres of Ancient Etruria.—By H. Torrens, Esq.
4. Central America, Chiapas and Yucatan, 2 vols.—By H. Torrens, Esq.

5. General Report on the Sanatory condition of the labouring population of Great Britain.—By H. Torrens, Esq.
6. Actes de L'Academie Royale des Sciences, Belles-Lettres, et Arts De Bordeaux, vol. 5th. parts I. II. III. IV. and vol. 6th. parts I. II. III. IV.—By the Society.
7. Journal of the Royal Geographical Society of London, vol. 15th, part 1st, 1845.—By the Society.
8. Transactions of the Geographical Society of London, second series, vol. 7th, parts I. and II.—By the Society.
9. Life of Rammohun Roy.—By Babu Kissory Chand Mittra.
10. Proceedings of the Hindu Theo-philanthropic Society, vol. 1st, 1844.—By Babu Kissory Chand Mittra.
11. Religious Hymns in Bengalee, composed by Rájá Rammohun Roy, 2 copies.—By Babu Kissory Chand Mittra.
12. Philosophical Transactions of the Royal Society of London, for 1845, part 1st.—By the Society.
13. Proceedings of the Royal Society, for November, 1844.—By the Society.
14. Proceedings of the Geological Society of London, vol. 4th. No. 101.
15. Æsop's Fables in Ordoo. By J. F. Corcoran, Esq. (35 copies.)
16. Meteorological Register for September, 1845, from the Surveyor General's Office. The London, Edinburgh, and Dublin Philosophical Magazine, Nos. 178, 180.—By the Editor.

Histoire des Sultans Mamlouks De L'Egypte, par M. de Quatremère.—Tome second.

PURCHASED.

17. The Classical Museum, No. 9.
18. Southey's History of Brazil, 3 vols.
19. History of Ancient Philosophy, 3 vols.
20. Journal des Savans for August, 1845.
21. The Annals and Magazine of Natural History, No. 105—September, 1845.
22. The Zoology of the Voyage of H. M. S. Sulphur, under the command of Capt. Sir E. Belcher R. N. C.B. F.R.G.S. &c. during the years 1836 to 1842, Nos. 4 and 5.

EXCHANGED.

23. Athenæum, No. 936, 937 and 938, for October, 1845.
24. The Edinburgh New Philosophical Journal, Nos. 77 and 78.
25. Proceedings of the Royal Society of Edinburgh, vols. 1 and 2, Nos. 25 and 26.
26. Transactions of the Royal Society of Edinburgh.
27. Mackerstorm's Magnetical and Meteorological Observations, for 1841 and 1842.
28. Proceedings connected with the Magnetical and Meteorological Conference, held at Cambridge in June, 1845, during the Meeting of the British Association for the Advancement of Science.

The Secretary presented the following list drawn up by Dr. Roer :

Abstract of the List of Books received into the Library from Jan. 14th, to Dec. 3d, 1845.

ENGLISH BOOKS.

1. Annals and Magazine of Natural History, vol. 14th, 1844, No. 92, 94, 96, 99, 100, 103 and 104.

2. Archæologia or Miscellaneous Tracts, relating to Antiquities.
3. Arnold (T.) Introductory Lectures on Modern History. Second edition. London, 1843, 1 vol.
4. Asiatic Journal and Monthly Register. Third series, vol. 9, November and December, 1844, Nos. 19 and 20; January, 1845, No. 21; No. 24. Fourth series; 1st vol. No. 1.
5. Athenæum, 1844, Nos. 844, 897, 1845, Nos. 898, 907, 913, 921, 923 and 935.
6. Beresford, (H. B.) Arabic Syntax, London, 1843, 8vo. 1 vol.
7. Blacker, (V.) Memoir on the Mahratta War. London, 1821, 4to. 1 vol.
8. Brougham, (H.) Political Philosophy. London, 1843—1844, 8vo. 3 vols.
9. Buist, (G.) Vid. Observatory at Bombay.
10. Calcutta Christian Observer, vol. 14, 1845, January to September and November.
11. Calcutta Journal of Natural History, 1845, Nos. 20—23.
12. Classical Museum, 1845, Nos. 6—8.
13. Correspondence relating to Persia, 1841, fol. 1 vol.
14. Ditto and Affghanistan, fol. 1 vol.
15. Crawford, (J.) History of the Indian Archipelago.
16. Donaldson, (J. W.) New Cratylus, Cambridge, 1839, 8vo. 1 vol.
 ————— Varronianus. 1 vol.
17. Dawson, (J.) Geographical Limits, History and Chronology of the Chera Kingdom of Ancient India.
18. Elliott, (H. M.) Supplement to the Glossary of Indian Terms, 1 vol.
19. First Report of a Committee of the Statistical Society of London, on the state of Education in Westminster, 1837.
20. Gibson, (A.) Notes on Indian Agriculture. P.
21. Grey, (H.) History of Etruria, part 2.
22. Hamilton, (W.) Description of Hindosthan. London, 1820, 4to. 2 vols.
23. Heeren, (A. W. L.) Reflections on the Political Intercourse, &c., of the ancient Nations of Africa, 2 vols.
24. History of the Reign of Tippoo Sultan, 1 vol.
25. Hügel, (v.) Travels in Kashmir and the Punjaub, 1845.
26. India-House Papers, Marquess of Hastings, 1824, fol. 1 vol.
27. Ives (E.) Voyage from England to India. London, 1773, 4to. 1 vol.
28. Jameson's Edinburgh New Philosophical Journal, Nos. 73—75.
29. Jerdon (J. C.) Illustrations of Indian Ornithology.
30. Jomotjerna, (M. B.) Theology of the Hindoos. London, 1844, 8vo. 1 vol.
31. Journal of the Agricultural and Horticultural Society of India, vol. 3, parts 3 and 4: vol. 4, parts 1—3.
32. Journal of the Royal Asiatic Society, Nos. 15 and 16.
33. Journal of the Royal Geographical Society of London, vol. 13, part 2.
34. Latham, General Synopsis of Birds. London, 1781—1790, 4to. 10 vols.
35. Latter, (T.) Grammar of the Language of Burmah. Calcutta, 1845, 4to. 1 vol.
36. Lloyd, (H.) Lectures on the Wave-Theory of Light.
 ———, Treatises on Light and Vision.
 ———, (B.) Mechanical Philosophy.
37. London, Edinburgh and Dublin Philosophical Magazine and Journal of Science, No. 162, Supplement, No. 163—177.

38. Maccelland, (J.) Vide Calcutta Journal of Natural History.
39. Macpherson, (J.) Natural History, Diseases, &c., of the Aborigines of Brazil, translated from the German of Dr. v. Martius. P.
40. Mantel's Medals of Creation, 2 vols.
41. Map of India, London, Allen and Co. 1845.
42. Maps, (5) of different parts of Asia. Berlin, Reimèr.
43. Martins, (v.) Vide Macpherson.
44. Meteorological Register from April to December, 1845.
45. Mill, (J. S.) System of Logic. London, 1843, 2 vols.
46. Muir, (J.) Address to the Students of the Benares College. P.
47. North British Review, Nos. 1—6.
48. Observatory of Bombay, Barometrical Observations. 1 vol.
 ————— Magnetic Reports, May to December, 1843.
 ————— Meteorological Observations for 1843.
 ————— Report on the Meteorological Observations in 1842, by G. G. Buist.
 ————— Tracings of the Wind-Guage, 1842 and 1843.
49. Oriental Christian Spectator, vol. 5th, No. 12, vol. 6th, Nos. 1 to 11.
50. Prinsep (H. T.) Historical Results from the Discoveries in Affghanistan, 1 vol.
51. Proceedings of the Academy of Natural Science in Philadelphia, vol. 2, Nos. 2 and 3.
 ————— Geological Society of London, vol. 4, Nos. 97—99.
 ————— Royal Asiatic Society for 1844.
 ————— Royal Society, No. 59.
 ————— Society of Arts.
 ————— Zoological Society, for 1843, 2d part, 2nd January and March, 1844.
52. Report of the 14th Meeting of the British Association for 1844. London, 1845, 1 vol.
53. Report of the Metropolitan Commissioners in Lunacy. London, 1844.
54. Report on the Vital Statistics of Large Towns in Scotland. London, 1843. P.
55. Selections of Papers from the Records of the East India House. London, 1820—1826, fol. 4 vols.
56. Specimens of the Illustrations of the Rock-cut Temples of India. 1 No.
57. Strange, Elements of India's Law, 2d vol.
58. Sykes, (W. H.) Buddhism versus Brahmanism. P.
 ————— Debate at the East India House.
 ————— Inscriptions from the Boodh Caves near Joonar.
 ————— Explanatory Notes, respecting 6 new varieties of vine.
 ————— Notice respecting some fossils collected by W. Lonee.
 ————— Remarks on the Identity of Personal Ornaments, sculptured on some figures in the Buddha Cave Temple at Carli.
 ————— Measurement of Heights by Common Thermometers.
 ————— Statistics of the Educational Institutions of the East India Company in India.
 ————— Statistics of the Metropolitan Commission in Lunacy.
 ————— Temple of Somnath.

- Three-faced Busts of Siva.
59. Thirlwall, (C.) History of Greece, 8th vol. Lardner's Cabinet Cyclopædia.
60. Todd, Discourses on the Prophecies relating to Anti-Christ.
61. Transactions of the Irish Academy.
 ————— of the Society of Arts, vol. 55.
 ————— of the Zoological Society, vol. 3. parts 2 and 3.
62. Usher's Works, vols. 2—13.
63. Walker, Livius, 7 vols.
64. Wall, Ancient Orthography of the Jews. 3 vols.
65. Whewell, Philosophy of Inductive Sciences, 2 vols.
 ————— History of Inductive Sciences, 3 vols.
66. Wray, (L.) Sugar-Planter's Companion, part 2d.

FRENCH.

67. Agassiz, (L.) Monographie des Poissons Fossiles. 1-2 livraisons.
 ————— Recherches sur les Poissons Fossiles, 17 and 18 livraisons.
68. Annales des Sciences Physiques et Naturelles de la Société Royale de Lyon.
69. Brosset, (M.) Catalogue de la Bibliothèque d'Edchmiadzin. St. Petersb. 8vo. P.
 ————— Description Géographique de la Géorgie, par le Szaréwitch Wak-
 housht. St. Petersb. 1842, 4to. 1 vol.
 ————— Monographie des Monnais Arméniennes. St. Petersb. 1839, 4to. P.
70. Bulletin de la Société de Géographie. Deuxième série. Tome 20, 1843. Troisième
 série, Tome 1.
71. Burnouf, (E.) Introduction dans L'histoire du Buddhisme Indien, vol. 1.
72. Collection Géographique de la Bibliothèque Royale. P.
73. D'armand, Documents and Observations sur le cours du Bahr et Abrial. P.
74. Florival, (V. de) Mékhitaristes de St. Lazare, Histoire d'Armenie, Venice, 1841,
 1 vol.
75. Journal Asiatique, 4me Série, Tome 3, Nos. 13—23.
76. ————— des Savants, January 1844 to January 1845.
77. Mémoires de la Société des Antiquaires du Nord, 1840—1843, 1 vol.
78. ————— de la Société de Physique de Genève, Tome 10, 2e Partie.
79. Siebold, (W. de) Lettre sur L'utilité des Musées Ethnographiques. Paris, 1843.
80. Tassy, (G. de) Rhétorique des Nations Musulmanes. Traduit du Persan. Paris,
 1844. P.

GERMAN.

81. Akademischer Almanach der Baierischen Akademie der Wissenschaften für das
 Jahr 1844. P.
82. Frähn, (Ch. M.) Ibn Fozlan's und Anderer Berichte über die Russen älterer
 Zeit. Text und Uebersetzung. Petersburg, 1823, 8vo. 1 vol.
 ————— Münzen der Chane vom Ulus Dsutchi's. Petersburg, 1834, 4to. 1 vol.
83. Hammer Purgstall, (J. v.) Geschichte der Ilchane, vol. 2d.
 ————— Zeitwarte der Gebets, Arabisch und Deutsch. Wien, 1844, 1 vol.
84. Jahrbücher der Litteratur, 1844, Nos. 105—108, 4 vols.
85. Klaproth, (J. v.) Archiv für Asiatische Litteratur, Geschichte und Sprachen-
 kunde. Erster Band. St. Petersb. 1810, 4to. 1 vol.

86. Pallas, (P. S.) Sammlungen historischer Nachrichten über die Mongolischen Völkerschaften. St. Peterb. 1776—1801, 2 vols.
87. Ritter, (H.) Geographie, vols. 2—9, 9 vols.
88. Schmidt, (J. J.) Grammatik der Tibetischen Sprache. St. Petersb. 1839, 4to. 1 vol.
 ——— Mongolisch-Deutsch-Russisches Wörterbuch. St. Petersb. 1835, 4to. 1 vol.
 ——— Thaten Bogda Jesser Chan's. Aus dem Mongolischen. St. Petersb. 1839, 8vo. 1 vol.
 ——— Tibetisch-Deutscher Wörterbuch. St. Petersb. 1841, 4to. 1 vol.
 ——— Weise und der Thor, Tibetisch and Deutsch. St. Petersb. 4to. 1 vol.
89. Stuhr, Reich sreligion der Chinésen, 1 vol.
 ——— Religions systeme der heidnischen Völkerschaften, 2 vols.

DUTCH.

90. Eysinga, (R. V.) Nederduitch en Maleisch en Maleisch en Nederduitch Woordenbook. Batavia, 1824, 2 vols.
91. Natuur—en Geneeskundig Archief voor Neêrlandsch Indië. Eerste Jaargang, 1844, 4 Nos. Tweede Jaargang, 2 Nos.
92. Temminck, (J. C.) Vid. Verhandlingen.
93. Tidsschrift voor Neerlands Indië. Zesde Jaargang, 12 Nos. Zevende Jaargang, 1845, 8 Nos.
94. Verhandelingen van het Bataviaasch Genootschap van Kunsten en Wetenschappen. Vols. 1, 5, 8, 11, 12, 15, 16 and 17, Nos. 2, 7, 18, 19 and 20.
95. ——— over de Natuurlijk ke Geschiedenis der Nederlaandsch overzeesche Bezittingen, door J. T. Temminck. 1 vol. Batavië, Leiden, 1839—1842, fol.
96. Vormaeer, (J. N.) Korte Beschrijving van het Zuid—Oostelijk Schiereiland van Celebes.

LATIN.

97. Bopp, (F.) Glossarium Sanscriticum, Fascicul. 2ns.
98. Eysinga, (P. R. de) Abul Abbasi Amedis Vita et Res Gestae. Lugd. Bat. 1825, 4to. 1 vol.
99. Fraehn, (Ch. M.) Recensio Numorum Muhammadanorum. St. Petersb. 1826, 4to. 1 vol.
100. Hamaker, (H. A.) De Expugnatione Memphidis et Alexandriae Liber. Text Arab. Lugd. Bat. 1825, 4to. 1 vol.
101. Hasskarl, (J. C.) Catalogus Plantarum in Horto Botanico Bogoriensi Cultarum Alter. Batav. 1844, 1 vol.
102. Hoogliet, (M.) Diversorum scriptorum loci de regia Aphtasidarum familia. Text Arab. and Versio Lat. Lugd. Batav. 1839, 4to. 1 vol.
103. Meursinge (B.) Asojutii Liber de interpretibus Korani. Text. Arab. Lugd. Batav. 1839, 4to. 1 vol.
 ——— Liber Alter.
104. Rutgers, (A.) Historia Jemanac sub Hasano Pascha. Lugd. Bat. 1838, 4to. 1 vol.

105. Sandifort (Edw. and Gerh.) *Museum Anatomicum Academiae Lugd. Bat.* 1793—1835, fol. 4 vols.

————-(G.) *Tabulae craniorum diversarum nationum.* Lugd. Bat. 1838—1843, fol. 3 Fasciculi.

106. Valeton (J. J. P.) *Taalibii Syntagma dictorum brevium et auctorum,* Text. Arab. et Versio Latina. Lugd. Bat. 1841, 4to. 1 vol.

107. Veth (P. J.) *Specimen e literis Orientalibus, exhibens majorem partem libri, Asojutii de nomia relativis inscripti,* Text. Arab. Lugd. Bat. 1840, 4to. 1 vol.

----- D. D. Pars Reliqua, 1842, 1 vol.

108. Weijars (H. E.) *Specimen criticum, exhibens locos Ibn. Khacanis.* Text. Arab. et Versio Lat. Lugd. Bat. 1831, 4to. 1 vol.

ORIENTAL LANGUAGES.

109. Armeno-Pysii Slowany. Moskwa, 1838, 8vo. 2 vols.

110. Chmidta (R. J.) *Polwigi, Zaslugh. Gevor.* St. Petersb. 1836, 4to. 1 vol.

111. Ciakeiark, (P. E.) *Nuovo Dizionario Italiano-Armeno-Turco.* Venezia, 1829.

112. Cobalebscimb (O.) *Mongolscar Khrestomatie.* Kasan, 1836—1838, 2 vols. 8vo.

113. Bengalee Tracts.

114. *Grammatica Tyresca-Tatarchago.* Kasan, 1839, 8vo. 1 vol.

115. *Hindee New Testament.*

116. *Hindustani Pentateuch.*

117. *Holy Bible in Hindustanee.*

118. *Haji S. Khalfae Lexicon,* 1 vol.

119. *Kitaiska Grammatica,* St. Petersb. 1838, Fol. 1 vol.

120. Krishna Lall Deb, *Prushnaprasika.*

121. *Lichaschababa, Map of the Huree Vesetra.*

122. *Logranie chi. Mogolsco Rogbees chi.* Kasan, 1841, 8vo. 1 vol.

123. *Mongolscæ Khrestomatie,* Kasan, 1836, 2 vols.

124. Muir, (J.) *Brief Lectures on Mental Philosophy, Sanscrit.*

125. *New Testament in Bengalee.*

126. ----- and English

127. *Persidichæ Krestomathe,* Moskwa, 1832—34, 3 vols. in 2.

128. Ponofa, (A.) *Arithmetic (Armenian).* Kasan, 1837, 4to. 1 vol.

129. *Psalms of David in Bengalee.*

130. Radhakant Deb, *Sanscrit Dictionary,* vol. 6th.

131. Risbi, (Seïda Muhammed) *Asseb-o-Isscrib ili, Lemb Planet.* Kasan, 1832, 4to. 1 vol.

132. Pchonbinot, (D.) *Dictionaire, Georgien, Russe-François.* St. Petersb. 1840, 4to. 1 vol.

133. *Tekstomb, (K.) Suhb Isbi. Isird ili Troedoba.* St. Petersb. 1839, 4to. 1 vol.

Read the following letter from the Society's London Agents:—

HENRY PIDDINGTON, Esq., *Sub-Secretary to the Asiatic Society.*

SIR,—We have received your letter of the 28th June last, enclosing a bill of lading for three cases shipped by the Lallah Rookh to our care, to be delivered as addressed. They shall have attention on the arrival of the vessel.

We are not prepared to promise the various numbers of the Asiatic Journal which are still required to complete the series in the Library of the Society. If we find we have them we shall be most happy to present them.

We are, Sir,
Your most obedient servants,

London, October 24th, 1845.

WM. H. ALLEN AND CO.

Read the following letter and enclosures from the Royal Academy of Christiania, forwarded with the bill of lading by Sir Charles Tottie, Norwegian Consul in London :—

Fra det akademiske Collegium ved det Kongelige Frederiks Universitet.

To the Asiatic Society of Bengal, Calcutta.

It gives the Council of this University great pleasure to acknowledge the reception of several very valuable scientific collections from the Asiatic Society at Calcutta, viz. a Zoological one which arrived last autumn; one of different sorts of seeds and one of several books, which have been received at earlier periods. The council, in returning its sincerest thanks for these renewed proofs of kindness towards our scientific institution, begs leave to send a collection 1st. of Zoological objects from this country, consisting of quadrupeds, birds, insects, skeletons, and skulls; 2d. of coins; 3rd. of books; 4th. of dried plants and seeds, as specified in the accompanying list. Although the university council knows perfectly well, that the scientific objects, which can be got in this country, and which it has in its power to present the Asiatic Society with, by no means can be compared to those which are found in your celebrated country, it trusts, you will be kind enough to take the will for the deed, and, as hitherto, continue the scientific intercourse which has been so happily established between both learned institutions. The Zoological objects which are wanted for the Museum of your Society, the university council shall take all possible care to procure, and it hopes, a new collection may be sent next summer.

It is scarcely necessary to add, that our university will feel itself most happy to show your Society any service with respect to scientific objects in its power.

F. HOLMBOE, FR. HALLAGER, DIETRICHSON, BLYTT, R. KEIJFER, CHR. HOLST.
The Council of the Royal University at Christiania, the 22d July, 1845.

Fortegnelse over endeel, som gave fra det Kongelige Norske Universitet i Christiania til det Asiatiske Selskab i Calcutta, bestente Bøger m. m.

1. Gaea Norvegica, zweite Lieferung mit zweif. safeln.
(Förste Levering er allerede sendt i Aaret, 1843.)
2. Nyt Magazin for Naturvidenskaberne.
(4de Binds. 1—IV Hefte.)
3. Norsk Magazin for Lægevidenskaben.
1—IX Bind: (ialt 27 Hefter.)
4. Das Königreich Norwegen, statistisch beschrieben von Amtmann Blom, mit zwei Karten.
5. Beretninger om Kongeriget Norges oconomiske Tilstand i Aarene 1835—1840.
med tilhørende statistiske Tabeller.

6. Udkast lit Lov om Medicinalvasenet i Norge—med Motiver.
 7. Indstilling fra Strafanstalt-Commissionen.
 8. Om Sindssvage i Norge.
 9. Hølst om de Britiske Fængsler m. m.
 10. Tre lagevidenskabelige Afhandlinger af Professør, Dr. medic. Holst.
 11. Björgynjar Kalfskinn, edid. P. A. Munch, Historiarum Professor.
 12. Enumeratio plantarum vascularium, gorecirca Christianiam sponte nascuntur, auctore M. N. Blytt, botanices professôre.
 13. Endeel forskjellige Academica.
 14. Det Kongelige Norske Frederiks Universitets Aarsberetning for 1842.
 15. En Pakke indeholdende 81 Stk Mynter.
 16. En Samling Frosorter.
 17. En Norsk Herbarium.
 18. Some drawings of Norwegian antiquities.
 19. En Samling of Insecter efter vedlagte Fortegnelse.
- Christiania 22d Juli, 1845.

CHR. HOLST.

List of Norwegian Mammalia and Birds sent from the Museum of the University to the Asiatic Society's Museum of Calcutta.

Mammalia

Skins.

1. *Felis Lynx* var. *virgata*, Nilss. ♀ adult : killed in the neighbourhood of Christiania, March, 1840.
2. ————— ♂ junior, killed February 1831.
3. —————, 1843.

(The three species of Mr. Temminck are not to be considered as species but only as varieties. Specimens of this species are difficult to procure.)

4. *Canis Lupus* ♂ adult : killed in the neighbourhood of Arendal, January, 1842 (common in Norway.)
5. *Mustela martes*, var : *abietina*, (not common) winter dress.
6. *Lutra vulgaris*, from Thellemarken, spec. junior, Autumn, 1844.
7. *Canis lagopus*, ♂ this specimen was shot in the neighbourhood of Christiania in the last hard winter. It happens seldom that it comes so far from the higher mountains.
8. *Meles Taxus*, ♂ (not rare in the southern part of Norway.)
9. *Castor Fiber*, ♀ (This animal is on the term of his extinction in Norway ; in 20 years our museum has procured only two specimens); this is from Thellemarken, 1844.
10. *Mus sylvaticus*, (very common.)
11. *Sciurus vulgaris* (abundant ; migrates in certain years, and is then very abundant).

Skeletons.

1. *Canis Lupus*, shot in the neighbourhood of Christiania, December 1844, (not full-grown?)
2. *Phoca vitulina*, shot in August, 1843, on the west coast of Norway, (young.)
3. *Delphinus leucopleurus*, Rasch, killed in the fiord of Christiania, June, 1842.
4. *Phocæna vulgaris*, (common.)

Crania.

- 1.—2. *Ursus arctus*, ♂ adult : ♀ junior. (This species is not rare in Norway.)
3. *Gulo borealis*, ♂ adult : (Not common and very difficult to procure.)
4. *Canis vulpes*, (common.)
5. Head of *Cervus alces* (with the skin on) : ♂ four years old. Is at the present time very difficult to procure. The feet of the animal are added.
6. A frontlet with adherent head-skin of *Cerv. Tavandus*, fem : ♂ killed November, 1843, in the Alps of Guldbrandsdalen.
7. A head without horn of the same animal.
8. A frontlet.

Birds.

1. *Pernio apinarus*, ♀ (a rare preying bird in Norway.)
 - 2.—3. *Buteo vulgaris*, (very common in the southern part.)
 4. *Milvus regalis*, ♂ (rare in Norway but common in Sweden.)
 - 5.—8. *Astur palumbarius*, old and young, (common.)
 - 9.—11. *Strix Aluco*, (common.)
 12. ——— *Otus*, (rare.)
 13. ——— *Tegnmalmi*, (not common.)
 14. *Passerina*, ♂ *Gen. acadica*, *Temm.* (rare.)
 15. *Cypselus apus*, (common.)
 16. *Caprimulgus europæus*, (common.)
 - 17.—18. *Picus viridis*, ♂ ♀ ditto.
 - 19.—20. ——— *martius*, (not rare.)
 21. ——— *leuconotus*, (rare.)
 - 22.—24. *Plectrophorus nivalis*, (in certain years common.)
 - 25.—26. *Emberiza hortulana*, (common.)
 27. *Pyrrhula vulgaris*, ♂ (ditto.)
 28. *Fringilla montifringilla*, ♂ summer dress (com. in the alp. reg.)
 29. ——— *spinus*, ♂ *hab. æstivali*, (common.)
 - 30.—31. *Sitta europæa*, ♂ ♀ : (common.)
 - 32.—33. *Hirundo rustica*, (abundant.)
 - 34.—35. *Bombycilla garrula*, ♂ ♀ (in certain winters very abundant.)
 - 36.—37. *Garrulus glandarius*, ♂ ♀ (common.)
 - 38.—39. *Nucifraga coryocatactes*, ♂ ♀ (this rare bird was in the past autumn very abundant in the whole peninsula and migrated southwards.)
 40. *Pica caudata*, (very common.)
 41. *Cinclus aquaticus*, ♂ : (common.)
 - 42.—43. *Anthus obscurus*, ♂ ♀ : (common on the west coast,) Christiansund, 1843.
 - 44.—45. *Motacilla flava*, (not rare.)
 46. *Saxicola ænanthe*, (very abundant.)
 47. *Lanius excubitar*, (rare.)
 48. *Crex pratensis*, (common.)
 49. *Totanus Glottis*, *hab. æstivali*, (not rare.)
 50. *Scolopax major*, (not rare.)
 59. *Corvus cornix*, (abundant.)
- Christiania, 20 Juni, 1845.

Read the following note from Captain Huddleston :—

MY DEAR SIR,—I have the pleasure to send a few horns, a large sheet of Nepaul hill paper, a small copper blow pipe used by the Sonars in the hills, and a few specimens of woods for the Asiatic Society's Museum, which I hope may be acceptable.

Your's truly,

W. HUDDLESTONE, *Capt.*

7th Regt. N. I.

Spence's Hotel, Jan. 2d, 1846.

Read the following letter :—

No. 678 of 1845.

FROM P. MELVILL, ESQ. *Officiating Under Secretary to the Government of India.*

To the Secretary to the Asiatic Society of Fort William, the 22d Dec. 1845.

FOREIGN AND SECRET DEPARTMENT.

SIR,—I have the honor to acknowledge the receipt of your letter without date, with its accompaniments, which have been retained in this office.

2. I have however to remark that, two other papers as noted in the margin did not

1. Notes on the Commerce, Revenue, and Military Resources of the Punjaub, taken in 1837.

2. Information of certain countries little known to Europeans lying beyond the Indus and Cabool Rivers.

accompany the above as required in the Office Memorandum from this Department dated 18th July last, No. 2044; I have therefore to request that they may be forwarded with the least practicable delay.

I have the honor to be, Sir,

Your most obedient servant,

P. MELVILL,

Offg. Under Sec. to the Govt. of India

Fort William, the 22d Dec. 1845.

Read the following letter from the Academie Royale de Bordeaux :—

Academie Royale Des Sciences, Belles-Lettres et Arts de Bordeaux.

MONSIEUR,—J'ai l'honneur de vous adresser le recueil des travaux de l'Academie Bordeaux durant les années 1843 et 1844.

Votre Société avait bien voulu nous faire passer autrefois le journal mensuel qu'elle publiait et cette communication était pour nous d'une bien grand prix; malheureusement depuis la fin de 1838, nous si avons plus rien rien de vos publications.

J'espère, Monsieur, que vous seréz assez obligeant pour nous en transmettre la suite; elle nous parviendra exactement si vous voulez bien l'adresser a Mr. Guestier junior, l'un de nos collegues.

Cet echange de travaux Scientifiques doit, de part et d'autre, tourner á un mutuel avantage.

Veillez agreer, Monsieur, l'assurance de ma consideration la plus distingué.

Bordeaux, Le 26 Juillen, 1845.

GRE. BRANET,

Secretaire General.

A Monsieur le Secrétaire de la Société Asiatique á Calcutta.

Read the following letter and catalogue :

TO H. TORRENS, ESQ. *Secretary, Asiatic Society, &c. &c. &c.*

SIR,—I beg you will do me the favour of presenting to the Asiatic Society the accompanying series of fossil shells from Danish and Swedish localities, identified in the annexed list, which I have lately received by H. D. M. ship *Galathea*, from Professor Forchhammer of Copenhagen. Some of the shells are mentioned and figured by Mr. Chas. Lyell, in his memoir on the Cretaceous and Tertiary Strata of the Danish Islands of Seeland and Möen. (*Transact. Geolog. Society. Vol. v. 2d. Ser. p. 243.*)

I have the honor to be, Sir,

Your most Obedt. Servt.

THEO. CANTOR.

Staff Barracks, Fort William, 29th Dec. 1845.

1. *Brachiurus rugosus*. Newer chalk. Faxoe.
2. *Brachiurus lævior*. Newer chalk. Faxoe.
3. *Serpula gordialis*. Greensand. Scania.
4. *Nautilus Danicus*. Newer chalk. Faxoe.
5. *Belemnites mucronatus*. Greensand. Scania.
6. *Belemnites mamillatus*. Greensand Scania.
7. *Trochus notiticiformis*, Schl. Newer chalk. Faxoe.
8. *Cerithium Fäxoëns*. Newer chalk. Faxoe.
9. *Cerithium Selandicum*. Newer chalk. Faxoe.
10. *Cyproea spirata*. Newer chalk. Faxoe.
11. *Cyproea bullata*. Newer chalk. Faxoe.
12. *Arca lineata*, Schl. Newer chalk. Faxoe.
13. *Nucula ovata*. Greensand. Scania.
14. *Nucula*, ——— ? Newer chalk. Faxoe.
15. *Terebratula carnea*. Newer chalk. Steons Klint.
16. *Terebratula flustracea*. Newer chalk. Faxoe.
17. *Terebratula*. Newer chalk. Faxoe.
18. *Terebratula lyra*. Greensand. Scania.
19. *Terebratula longirostris*. Greensand. Scania.
20. *Terebratula ovata*. Greensand. Scania.
21. *Lima ovata*. Greensand. Scania.
22. *Lima* ——— ? Greensand. Scania.
23. *Lima denticulata*. Greensand. Scania.
24. *Pecten inversus*. Greensand. Scania.
25. *Pecten subaratus*. Greensand. Scania.
26. *Spondylus lamellosus*. Greensand. Scania.
27. *Spondylus truncatus*. Greensand. Scania.
28. *Mytilus unguatus*. Newer chalk. Faxoe.
29. *Ostrea diluviana*. Greensand. Scania.
30. *Ostrea lunata*. Greensand. Scania.
31. *Ostrea vesicularis*. Newer chalk. Steons Klint.
32. *Ostrea reflexa*. Newer chalk. Faxoe.
33. *Ostrea hippopodium*. Greensand. Scania.

34. *Ostrea curvirostris*. Greensand. Scania.
35. *Ostrea acutirostris*. Greensand. Scania.
36. *Exogyra cornu-arietis*. Greensand. Scania.
37. *Exogyra laciniata*. Greensand. Scania.
38. *Exogyra auricularis*. Greensand. Scania.
39. *Crania striata*. Greensand. Scania.
40. *Crania nummulus*. Greensand. Scania.
41. *Ananchytes sulcata*. Greensand. Scania.
42. *Ananchytes striata*. Newer chalk. Steons Klint.
43. *Dentalium rugosum*. Newer chalk. Seeland.
44. Impressions of *Isis Stobæi*. Scania.
45. *Isis Faxoensis*. Newer chalk. Faxoe.
46. *Fungia coronata*. Greensand. Scania.
47. *Fungia*. —————? Greensand. Scania.
48. *Coprolithes Mantelli*. Saxony.

Some of the fossil shells mentioned in Transactions of the Geological Society, Vol. V. 2d. Series, XX. On the Cretaceous and Tertiary Strata of the Danish Islands of Seeland and Möen. By Charles Lyell, Esq. P. G. S., F. R. S.

Read the following letter from Lieut.-Colonel Stacy addressed to the Sub-Secretary.

MY DEAR SIR,—At page 81 of Proceedings, No. 163, July, 1845, you are quoted as the authority for Captain Cautley having said I presented the two articles he took down for me from Futteyghur to the Society. As I understand Captain Cautley has sailed, allow me to correct this mistake. They are not presented to the Society but simply sent for submission to the Society and then to be placed with the rest of my property in the museum.

I beg you will do me the favour of communicating accordingly to the Society. Will you also do me the favor to request that a spare print of any published coins may always be sent with my copy of the journal, I should be obliged by your sending me plates, Nos. 1 and 2, of Indo Sythic coins, by Lieut. Cunningham.

Your's, &c.

S. B. STACY.

Meerutt, December 1st, 1845.

The Sub-Secretary explained that his present impression was still that Captain Cautley had not only *presented* the antiquities from Col. Stacy, but that a chit had been sent with them stating it, which he yet hoped to find. It was ordered that the note should be printed as a record.

Captain Marshall objected to the infringement of the rules of the Society, in the case of the Committee of Papers having engaged in certain financial arrangements which they ought not to have interfered with. He urged a recurrence to the strict letter of the rules restricting the Committee to the execution of their own peculiar duties.

An explanation was offered by the Secretary, which went to shew

that the Committee did no more than propose a course to be adopted by the Society, without taking any actual measures themselves.

After some discussion the subject dropped.

Captain Marshall remarked on a certain entry in the proceedings of May, 1845, as follows :

“The Secretary brought forward a MS. Journal of Travels in the Himalaya written by me in 1827, and a book of drawings which had been sent to him for insertion in the Journal of this Society. The Secretary remarked to the Meeting, that my Journal was of “a private and domestic nature,” and he further stated to the effect that the paper had lost its interest from the long period which had elapsed since its composition, and in consequence of other travellers having since passed over the same ground. The Secretary then, after a short pause, and without submitting my contribution for the orders of the meeting, proceeded to other business.”

Resolved that the Society put on record, that the expressions made use of by the Secretary with respect to Capt. Marshall’s paper are not the sentiments of the Society, and they do not contain the opinion of the Society as to its contents.

The Secretary expressed his regret at having recorded in the proceedings his individual opinion of a Journal, as to which other and most competent judges thought very differently, and which he did not at the time know to be Capt. Marshall’s.

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

The only contributions we have received this month have arrived too late for me to report upon them, having no letters or papers with them. The following letter from Lieut. Sherwill has just been received.

TO H. PIDDINGTON, Esq. *Curator to Museum Economic Geology, Calcutta.*

MY DEAR PIDDINGTON,—I write these few lines to inform you of the despatch per steamer of a small box containing specimens of a very pretty variety of kunkur, from the district of Benares, containing about fifty per cent. of fresh water shells, from an inch and a half in length to those of a microscopic smallness. I have only been able out of many thousands, to detect more than 5 kinds, all of which are of fresh water origin, exceedingly brittle, but beautifully perfect, evidently the deposit of an extensive lake, long since filled up, as they lie 20 feet below the soil. For the following description of locality, &c. I am indebted to my friend, Mr. George Wyatt, Deputy Collector of Benares.

“The shell kunkur is found in large quantities between the Naudh and Burnah Nuddies, at a depth of 15 to 20 feet under the surface of the country. The specimens are from the village of Pindra on the road from Benares to Jounpoor. Towards the Naudh Nullah the shells in the kunkur are in larger quantities than in the kunkur about the Burnah. It is found in one uninterrupted sheet from 15 to 20 miles in extent varying from one to two inches in thickness. The kunkur is eagerly sought after for Lime, which is purer and more valuable than that made from the common nodular kunkur.

“Small wells are dug, barely wide enough to admit the workman, and when he arrives at the stratum of kunkur he works laterally as far as he can with safety, breaking up the kunkur with a pickaxe.

“The kunkur is too soft to be used as metal for roads.”

I enclose you a sketch of the various shells—natural size ; and have sent per dák bhangy a small box containing some detached ones.

R. S. SHERWILL.

Buxar, 29th December, 1845.

MUSEUM OF ECONOMIC GEOLOGY.

I have been mostly employed in the Laboratory during this month, but have not sufficiently completed any thing to report upon it with confidence.

The collections of the Coal and Iron Committee have been received into the Museum, but I have been obliged to delay arranging so as to report upon them, in order to get the cases painted.

H. PIDDINGTON.

For all the above communications and presentations the best thanks of the Society were awarded.

Proceedings of the Asiatic Society of Bengal, FEBRUARY, 1846.

The stated monthly meeting of the Society was held at the rooms at $\frac{1}{2}$ past 8 P. M. on Wednesday the 4th February.

The Rev. Dr. Hæberlin in the chair.

The following new member, proposed at the last meeting, was ballotted for and declared duly elected :

Lord Arthur Hay.

And the following gentlemen were proposed :

Lieut. T. C. Blagrave, 26th N. I. (Scinde.)

Lieut. C. E. Burton, 46th N. I. (Scinde.)

Both proposed by Mr. Piddington and seconded by the Secretary.

The Proceedings of the January meeting were read, and with some alterations and additions confirmed, it being understood that a Protest made by Capt. Marshall be withdrawn, and that a note be substituted satisfactory to him on the subject of which he complained.

Read the following list of books presented, purchased and exchanged.

List of Books received for the Meeting of Wednesday the 4th February, 1846.

PRESENTED.

1. Meteorological Register for November and December, 1845, from the Surveyor General's Office.
2. The Oriental Christian Spectator for January, 1846.—By the Editor.
3. The Calcutta Christian Observer, for February, 1846.—By the Editors.
4. London Edinburgh and Dublin Philosophical Magazine and Journal of Science, No. 181, for November, 1845.—By the Editor.
5. Bulletin de la Societe de Geographie, tome III.—By the Society.
6. Hindu System of Medicine, by T. A. Wise, Esq., M. D.—By the Author.
7. Selections from several books of the Vedanta, translated from the Original Sanscritta, by Raja Rammohun Roy.—By Babu Kissory Chand Mittra.
8. Introduction to Vajasonoy Oopanishad.—By Babu Kissory Chand Mittra.
9. Discourse read at the third Hare Anniversary Meeting.—By Babu Kissory Chand Mittra (2 copies.)
10. Bengalee tract on the power, wisdom and goodness of God.—By Babu Kissory Chand Mittra.
11. Notice Sur l'Establishment Geographique de Bruxelles par M. Drapiez.—By M. D. Vander Maelen.

12. *Etudes Sur l'Histoire primitive des Races Oceaniennes et Americaines* par Gustave D'Eichthal.—By the Author.

13. *Histoire et Origine Des Foulas ou Fellaces* par Gustave D'Eichthal.—By the Author.

14. *Grammar Persanne* de Sir W. Jones.—By M. Garcin de Tassy.

15. *Catalogue de l'Etablissement Geographique de Bruxelles.*—By Ph. Vander Maelen.

16. *The Universal Atlas of Geography Prospectus.*—By Ph. Vander Maelen.

17. *Atlas de L'Europe, Prospectus.*—By Ph. Vander Maelen.

PURCHASED.

18. *Edinburgh Review*, from No. 1 to 166 (with the exception of two Nos.)

19. *The North British Review*, No. 7. November, 1845.

20. *The Annals and Magazine of Natural History*, No. 106, November, 1845

21. *Hurrebhuctee Bilas* (2 copies.)

22. *The Birds of Australia*, parts 1 to 19, by J. Gould, F. L. S.

23. *Journal des Savants*, September, 1845.

EXCHANGED.

24. *Journal Asiatique*, Nos. 25 and 26, for July and August, 1845.

25. *Proceedings of the Geological Society of London*, Vol. 4, Nos. 102 and 103.

26. *The Athenæum*, Nos. 939 to 944.

27. *Journal of the Agricultural and Horticultural Society of India*, part 4. vol. IV.

Read the following letter from Dr. Wise :—

TO H. TORRENS, ESQ., *Secretary, Asiatic Society.*

MY DEAR SIR,—With this note you will receive a copy of my Commentary on the Hindu System of Medicine, which I request you will do me the favor of presenting to the Asiatic Society.

THOS. S. WISE.

Dacca, 27th January, 1846.

Dr. Hæberlin, who stated that he had read the work, and was acquainted with the original Shastras from which it was compiled and abridged, and Mr. Piddington who stated that in the absence of Dr. Wise in Europe he had corrected a great deal of it for the press, and had since read the remainder, both spoke in terms of high commendation of this book, as one requiring great labour, long and careful research, and talent and perseverance of no common order to produce ; and which for the scientific man, the physician and the philosopher, and for all who had not access to, or could not read the often rare and valuable works which Dr. Wise has consulted, would be quite invaluable.

The Secretary suggested that a work of this kind would be highly gratifying to many of the Society's correspondents both oriental and scientific, if presented to them, as usual with the Society's own publications.

It was therefore proposed by Dr. Hæberlin, seconded by the Secretary, and carried unanimously :

That the Society do purchase 30 copies of Dr. Wise's work for presentation to its correspondents.

The Secretary was requested to communicate with Dr. Wise as to the price.

Read a letter from the Society's London Agents announcing shipment and enclosing Bill of Lading for 3 cases and 1 bundle specimens of Natural History from the Royal Academy of Christiana, per ship Persian, Capt. Edington.

Read the following letter :

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

SIR,—We have received your favor of the 3d September, ordering us to return to India about half of the stock of the Asiatic Researches received from Mr. John Murray in March, 1844.

We have had the volumes named in your letter divided into equal proportions, in case of accident to the vessel, and have shipped one portion packed in six cases by the *Euphrates*, Capt. Wilson, and for which we beg to enclose you a Bill of Lading. We annex a memorandum of the cost of the cases and the shipping expenses upon them amounting to £18-2-0—which sum we shall place to the debit of the Society. The Researches were received from Mr. Murray in sheets and in the absence of instructions we have not thought it advisable to subject the Society to the expenses of boarding so large a number of volumes without orders to that effect.

The shipment has not been insured, but should you think it necessary it can be done in Calcutta, upon the receipt of this advice, nearly as cheap as it could have been effected here.

The second portion of the Researches will be forwarded by the next vessel for Calcutta. Should you think it necessary to effect it, insurance on both shipments may be done at the same time, as the next will be a duplicate of the present.

We shall be obliged by your saying what we are to do with the Researches that will, after the second shipment, still remain in our hands. We have some time since expressed our inability to dispose even of one set, and were the Researches advertised we fear the result would not be satisfactory. We shall have no objection to continue the care of the Researches, but if we cannot make sales it is only reasonable that we should charge warehouse-room for the books. We shall be

much obliged if you will consider the subject and let us know what you think should be done.

WM. H. ALLEN AND CO.

London, December 3d, 1845.

ASIATIC SOCIETY, CALCUTTA, TO WM. H. ALLEN AND CO.

5 Asiatic Researches, Vol. 1, 4to.	5 Asiatic Researches, Vol. 14.
2 Ditto Vol. 2.	50 Ditto Vol. 11.
40 Ditto Vol. 10.	25 Ditto Vol. 6.
50 Ditto Vol. 7.	30 Ditto Vol. 8.
50 Ditto Vol. 9.	100 Ditto Vol. 12, 8vo.
7 Ditto Vol. 13.	13 Ditto Vol. 12, 4to.

Charges.

Six Cases for packing lined with Tin, 1 to 6, at 33s. each	9 18 0
Packing and examining the same,	1 12 0
Entry, Cartage to the West India Docks, Wharf Charges, Shipping Expenses and Bills of Lading,	2 7 0
Freight and Primage,	4 5 0
	£ 18 2 0

WM. H. ALLEN AND CO.

Some conversation occurred on the subject of the enquiry and reference made by Messrs. Allen and Co. in this letter, when it was resolved that a communication be made to Mr. König of Bonn, informing him of the number of the volumes of the Researches which would yet remain in London, authorising him, as the Society's continental bookseller, to indent upon Messrs. Allen for such number of copies as he may wish for, and requesting him generally to interest himself and afford the Society his best advice and assistance in the disposal of the home stock.

The Secretary stated that he had purchased, subject to the Society's approbation, a complete set of the Edinburgh Review at the low rate of 1-4 per volume. The purchase was duly sanctioned.

Read the following letter:—

To the Secretary to the Asiatic Society.

SIR,—I am directed to acknowledge with thanks the receipt of your present of Corcoran's Jouhan-i-Akhlak, being the Fables of Esop translated into Oordoo, and to acquaint you that they have been deposited in the Library of the College of Fort William in the name of the Asiatic Society of Calcutta.

G. T. MARSHALL,

College of Fort William, 12th Jan. 1846.

Secy. College.

Read the following letter :—

H. TORRENS, ESQ. *Secretary and Vice-President of the Asiatic Society.*

SIR,—Herewith I beg to submit a copy of the *Tazaka* in Original Sanscrit, being a treatise on Astrology compiled by *Neelkantha*, a celebrated Pundit of ancient times, and I hope you will kindly accept it as a present to the Society, and allow it to be placed in its Library.

The work is of a curious nature, as it contains several Arabic words written in Sanscrit character ; such as,

موسولح सुसुल्लः Moosullah.

انتها इतिहा Intihá.

اتصال इतिहाल Ittisál.

مقبول सकवल Mukbool.

غيرمقبول गरसकवल Ghyr Mukbool.

حد हद् Hadd, &c. &c.

and I conclude from the system of the Zodiac adopted in it being precisely the same as in the *مِل*, Ramal, or Astrology of the Arabs, that it owes its origin to the Mahommedans ; and the compilation, or rather the translation, must have been made during the time this country was invaded bythem. The work, however, is in much repute in Hindu Society, notwithstanding the religious prejudices of the one being opposed to those of the other, and I therefore presume to offer it as a present on account of its curiosity.

NEELRATNA HALDAR.

Calcutta, the 1st February, 1846.

Read the following extracts from a letter to the Sub-Secretary from Lieut. Blagrave, dated 21st Dec. 1845.

Extracts from a letter from Lt. Blagrave, B. N. I., to the Sub-Secretary, dated Akul ka Got (Scinde), 21st December, 1845.

“ Many thanks to you and to Mr. Torrens for the kind interest you have taken with us “ young Egyptians ;” your proposition is a most advantageous one for us, and no doubt will be gladly accepted, but I doubt whether for some time yet we shall have ought much worth publishing, but there is no saying, for there are many men in Scinde well qualified to write on different interesting subjects, but at present they have either no time or else no inclination to do so ; the Society was got up by a few of us more for the sake of establishing a Museum at Kurrachee, and eventually good local ones at Hyderabad and Sukkur ; we have got about six and twenty subscribers, and have already got an embryo Museum consisting of a little of every thing, fossils, birds, fish, insects, snakes, &c., &c. I and a few others are going on collecting for it, and I hope that by this time next year we shall have a house and something in it to shew, and then we may hope for more assistance from those that have it in their power to aid us ; but as soon as I receive your next letter, which you say it to be an official copy of your proposition, I will send it down to Kurrachee

and get the votes of the members upon it. Lt. Burton tells me he has received a letter from some gentleman (I forget his name) in charge of your Museum, asking for specimens of the Scinde wolf, foxes, rare birds, fish and reptiles. I will so long as I remain in Scinde take care that a duplicate collection of all specimens shall be made by myself and people, the one set of which shall be forwarded to you, and will write to our Secretary and request him to lay by all duplicate specimens that he may receive for you."

"Should I remain in Scinde, which is doubtful, I shall be stationed at Sehwan, where I hope to make some discoveries among the ruins or rather foundations of the Old Fort. I have got a copy of some inscriptions in Arabic and Persian on some stones found by Capt. Lavie, the Collector there, when digging a foundation for some buildings; the people say they are 600 years old, but as I believe Captain Lavie intends sending or has sent a description and translation of the inscriptions down to our Secretary, I need not forward mine to you, at least until I hear whether he has done so or not."

"By the by, have not you published, or are publishing, the fish of the Indus sketched and collected by Sir A. Burnes? if so, what number have you got? there are an immense number and perhaps you have not all; if you could furnish me with a list of the Native names (I suppose Sir A. Burnes sent them), I should then know whether any that I may collect would be worth sending to you or not."

The Secretary presented, on the part of Edward Wyatt, Esq., Deputy Collector, a Statistical Memoir of the district of Benares.

Owing to the lateness of the hour the Report of the Curator of the Museum of Economic Geology and Geological and Mineralogical Departments was not read.

The best thanks of the Society were voted for the various communications and presentations made.

*Proceedings of the Anniversary Meeting held at the Society's Rooms,
on the 4TH MARCH, for the 7th January, 1846.*

The Rev. Dr. Hæberlin, in the chair.

The following gentlemen, proposed at the last meeting, were balloted for and declared duly elected :

Lieut. T. C. Blgrave, 26th N. I. (Scinde).

Lieut. C. C. Burton, 26th N. I. (Scinde).

The usual communications were ordered to be made to them.

The following new member was proposed :

J. T. Shave, Esq., proposed by S. G. T. Heatly, Esq., seconded by the Secretary.

The following gentlemen were elected as the Office-bearers of the Society for the ensuing year :

Vice-Presidents.—The Lord Bishop of Calcutta ; the Hon'ble Sir J. P. Grant ; the Hon'ble Sir H. W. Seton ; Lieut.-Colonel W. N. Forbes, and H. Torrens, Esq.

Secretary.—H. Torrens, Esq.

Librarian and Assistant-Secretary.—Babu Kissory Chand Mittra.

Committee of Papers.—The Rev. Dr. J. Hæberlin, W. P. Grant, Esq., C. Huffnagle, Esq., G. A. Bushby, Esq., W. Tayler, Esq., Babu Prosnocomar Tagore, S. G. T. Heatly, Esq., W. B. O'Shaughnessy, Esq., M. D., Lieut. A. Broome, B. H. A.

The proceedings for February, having been read, it was proposed by Colonel Forbes, that they be confirmed and published as respects the propositions put to the vote and carried in the latter portion of the proceedings, all else being recorded and not published.

Seconded by the Secretary.

The question was put to the vote and carried by a majority.

Read the following list of books, presented, purchased, and exchanged :

List of Books received for the Meeting of Wednesday, the 4th March, 1846.

PRESENTED.

1. Meteorological Register for January, 1846. From the Surveyor General's Office.
2. The Calcutta Christian Observer, for March, 1846.—By the Editors.
3. The Oriental Christian Spectator, for February, 1846. By the Editor.
4. London, Edinburgh and Dublin Philosophical Magazine, No. 179, for September, 1845.—By the Editor.
5. Zeitschrift für den Kunde des Morgenlandes herausgegeben von Christian Lassen, Fünften Bundes Zweites Heft, 1844.—By the Author.
6. Atlas of Anatomical Plates, Fasciculus I. containing the Bones.—By F. J. Mouat, M. D.
7. Astronomical Observations made at the Royal Observatory, Cape of Good-Hope, 1834, under the direction of F. Maclear, Esq.: F. R. S. R. A. S., &c. &c., Her Majesty's Astronomer, vol. 1st.—By the Royal Society.
8. Proceedings of the Zoological Society of London, part 12, 1844.—By the Society.
9. Tareek Eausafee, by Esuf Khan Hydrabadee.—By the Author.

PURCHASED.

10. Wilkinson's Manners and Customs of the Ancient Egyptians, 5 vols.
11. Plates to Wilkinson's Ancient Egyptians.
12. Journal des Savans for October, 1845.
13. Annals and Magazine of Natural History, vol. 16, No. 107, for Dec. 1845.
14. Gould's Australian Birds, part XX.
15. Sanghita, 18 numbers.
16. Edinburgh Review, Nos. 161 and 162.

EXCHANGED.

17. Journal Asiatique, vol. 5, No. 24, June, 1845.
18. The Athenæum, No. 946 to 948, for December, 1845.

Read the report of the Committee of Papers upon the questions which have occupied its attention as regards the employment of a salaried Sub-Secretary; it appearing that the funds of the Society do not permit of the maintenance of this officer, the Committee recommended that, much as it regretted the necessity which the proposed arrangement included of depriving the Society of the services of Dr. Roer, it was obliged to suggest a re-arrangement of the Secretary's establishment, whereby an individual, in a position to devote the whole of his time to the duties of Librarian, and capable at the same time of acting as assistant to the Secretary might be engaged. The Committee, therefore,

suggested that funds not being available, the office of Sub-Secretary should cease to exist, and that arrangements should be adopted by the appointment, experimentally, of Baboo Kissory Chand Mitter, as Librarian and Assistant-Secretary. It was resolved that letters should be addressed to Mr. Piddington and Dr. Roer accordingly, and that the native gentleman above-named should be appointed to the offices indicated on a salary of eighty Rupees a month, for six months, with an assistant at forty Rupees. The salary of Babu Kissory Chand Mitter to be increased to 100 Rupees at the end of that period, if the arrangement be found to prove satisfactory. The question was put to the vote and carried by a majority.

It was then proposed by Dr. Hæberlin, and carried by acclamation:—

That the Society offer to Dr. Roer, the expression of its regrets at losing the advantage of his services as Librarian, and apprise him that he has been elected an Associate Member of the Society.

It was proposed by Dr. Hæberlin, seconded by the Secretary, and carried by acclamation:—

That the thanks of the Society be voted to Mr. Piddington for the valuable and constant assistance which he has afforded to the Society and the zealous manner in which his services have been invariably devoted to it.

The accounts of the Society having been laid upon the table by the Secretary for the inspection of the members, it was resolved that C. K. Robison, Esq., Capt. Marshall, the Rev. J. Macqueen, and J. Ward, Esq., be requested to form a Committee of Audit.

For all presentations, the thanks of the Society were accorded.

Proceedings of the Asiatic Society for the month of APRIL, 1846.

The monthly meeting of the Society was held at the usual hour at the rooms on Wednesday the 1st of April. Colonel Forbes, Vice-President, in the chair.

Read a letter from the Secretary, apologising for his inability to attend the meeting, and intimating that Mr. Heatly would officiate for him during the evening.

J. T. Shave, Esq., proposed at the last meeting, was ballotted for and declared to be duly elected as a member. The usual communication was ordered to be made to him.

The Proceedings of the March meeting were then read, confirmed, and directed to be published.

Read the following list of Books :—

List of Books received for the Meeting of Wednesday, the 1st April 1846.

BOOKS PRESENTED.

1. Meteorological Register for February, 1846, from the Surveyor General's Office.
2. The Calcutta Christian Observer for March, 1846.—By the Editors.
3. The Oriental Christian Spectator for February and March, 1846.—By the Editor.
4. Brief lectures on Mental Philosophy and other subjects, delivered in Sanscrit to the Students of the Benares Sanskrit College, with an address to the Pundits and Students. (2) Copies.—By J. Muir, Esq. C. S.
5. The Oriental Translation Fund.—By the Oriental Translation Fund.
6. Ibn Khallikans Biographical Dictionary, Translated from the Arabic by Baron Mac Guckin de Slane, vol. iii. Part 1. By the Oriental Translation Fund.
7. Astronomical Observations made at the Observatory of Cambridge, by the Reverend J. Challis, M. A. By the University of Cambridge.
8. Journal of the Royal Geographical Society of London, vol. 15, Part II. 1845.—By the Society.
9. The London, Edinburgh, and Dublin Philosophical Magazine, No. 184.—By the Editor.

PURCHASED.

10. The Classical Museum, No. 10.
11. The Annals and Magazine of Natural History, No. 109.—January, 1846.
12. Journal des Savants.
13. Shaw's Metal Work.
14. The Hindústání Manual. By Duncan Forbes.—
15. Bhagbut Gita.

EXCHANGED.

16. The Athenæum, January 3d, 10th, 17th, 24th, and 31st, 1846.
17. The Edinburgh New Philosophical Journal.—By Professor Jameson.

Read the following memorandum by the Secretary, accompanying a copy of a Páli inscription laid on the table for the inspection of members :—

The inscription was sent, through Mr. Beadon, by Mr. Latour, Magistrate of Behar. Further details as to the exact place of its discovery have been requested to be supplied; in the meantime care has been taken to attempt to decypher the character, which is as a whole new; some of the letters will be readily recognized as coincident with certain of the old Páli of the Jats, but the greater part are of a decidedly Tibetan type. Mr. Paul, who with the late Pundit Kamlakanta was employed by my predecessor Mr. J. Prinsep in aiding to decypher, has been referred to as a Tibetan scholar. The Pundit, Sarodah Pershad, will also prepare a list of the recognizable characters of the Páli occurring in it. When these preliminary labors have been performed, should Dr. Hæberlin, the Reverend Mr. Long, Captain Marshall or other Orientalists of the Society not desire to take up the examination, I would suggest its being referred to Mr. Hodgson, the inscription being in all probability valuable, and on subjects relating to the early history of Buddhism. The site of its discovery (ancient Maghodha) and the philological affinity of its characters both point to this conclusion.

Dr. Hæberlin having intimated his willingness to examine and report on the inscription, if provided with information regarding the facts of its discovery, the Secretary was instructed to make it over accordingly to that gentleman, with all the information that had transpired relative to it.

Read the following letter from Colonel Low (Penang) :—

To the Secretary of the Asiatic Society.

Province Wellesley, Penang 10th Feb. 1846.

DEAR SIR,—I will esteem it a great favour if you can supply me with *specimens*, where they differ from each other, of the inscriptions in the Páli or Pracrit character which have been discovered hitherto in the East—since such would mate-

rially assist me in my antiquarian researches here. I do not wish for specimens of Sanscrit inscriptions. I wish to have the numerals also of each kind.

I beg to refer, in explanation of this my request, to p. 412-13 of No. XII. of the *Journal of the Bengal Asiatic Society*, my object being to have specimens of the Inscriptions arranged by Mr. Wathen (vide p. 413) of the said language, as well as of any other of value, beginning from the earliest and up to the latest.

I have requested Mr. Morgan to defray any charge for copying, should the Society favor me by permitting it, and to receive your reply.

I remain, Dear Sir,

Your's very faithfully,

JAMES LOW.

P. S.—I am also very anxious to have a correct alphabet of the language employed by the Priests of Chang in Assam, and the characters used by them, with a vocabulary of, say 100 of the most prominent words, and the numerals. From the rather scanty specimens in my possession I am induced to believe both to be of Siamese origin, i. e. that Siamese Priests carried them to Assam.

A list of Assamese records and numerals would likewise be very desirable, for I believe they can be nearly identified with the Siamese spoken language.

Read also a letter from Messrs. Macintyre and Co., stating that they were prepared to pay for the expense of copying the inscriptions Col. Low applies for.

Referred to the Secretary to report in what manner Col. Low's request could be complied with.

Read a letter from Messrs. John Munro and Co., requesting the return of a statue of Silenus belonging to Col. Stacy, but in deposit with the Society.

Resolved that the statue be returned to Col. Stacy, and a *cast* taken from it with the proprietor's permission.*

Read the following extract of a letter from J. R. Logan, Esq., Singapore:—

To the Secretary of the Asiatic Society of Bengal.

By the Peninsular and Oriental Company's Steamers I have forwarded, under cover to your address, a paper on the Geology of Singapore, &c., which if thought worth insertion in the Society's *Journal* is much at your service. It is I regret rather long, but it contains the results of much observation and reflection, directed to a locality hitherto almost unexamined and from swamps, dense jungle and want of roads not

* The *Journal* (vol.—p.—) already contains an account and delineation of the sculpture. ED.

easily examinable. If too long to appear in one number a convenient break will be found at the end of p. 33.

The paper alluded to in it on the Straits of Malacca and the alluvial plains on its borders is well advanced, but as it is mostly a collection of facts gathered from various sources not always accessible, it may be some time before it is completed.

From time to time I will send notes on different localities in Singapore and the vicinity, and ere long I hope, with the co-operation of Mr. Thomson, to furnish you with a geological map with sections.

A short time ago I transmitted through Mr. Prinsep an account of a hill range in Penang, and I requested him to ascertain from you whether translations or abstracts of Malayan works would be suited for the Journal; my professional avocations allow me occasional leisure but the little that I have I shall willingly bestow in advancing to the utmost of my power the objects of the Society, and I shall value any suggestions you may oblige me with touching any enquiries it would desire to be prosecuted here.

Read the following letter from Edward Madden, Esq., Almorah:—

To the Secretary of the Asiatic Society, Calcutta.

DEAR SIR,—Last autumn I performed a journey from Simla over the snowy range into Kunawur, of which I have drawn up some notes, chiefly botanical, which perhaps you might deem acceptable for publication in the Journal of the Asiatic Society. They extend or will extend to some 60 pages of foolscap and will be ready by the end of this month, and I shall then be happy to forward them to you on receipt of intimation from you that such matters would be desirable for the Journal.

The route referred to includes the Shatool and Roopice Passes, and other districts not often travelled, and some of them little known.

Your's faithfully,

EDWARD MADDEN.

Almorah, 17th March, 1846.

Read the following letter from Captain Hollings, Lucknow:—

To the Secretary of the Asiatic Society, Calcutta.

MY DEAR SIR,—I have been desired by Eusoof Khan, an intelligent officer in the service of His Majesty the King of Oudh, to forward to you for presentation to the Asiatic Society a Book in Persian containing an account of his voyage to England and journey through that country and part of France, &c., in 1837-38—and some coins, said to be of ancient date, which he picked up in different parts of Oude. I have sent a copy of the work written in Oordoo to Dr. Sprenger at Delhi, with the view to its publication being undertaken by the Translation Society.

As Eusoof Khan is anxious to return to England if he can get sufficient money, I trust that if there is any chance of a profitable sale the Society will undertake the publication of the work.

As I am about to leave Lucknow and proceed to join my Regiment by Dak, I shall feel obliged by your addressing any reply you may send to the address of Eusoof Khan, Adjutant Artillery, H. M. K. of Oudh's service, Lucknow, care of Captain Drake, officiating Superintendent of Police, Lucknow.

The coins were given to me on the 4th December, but I delayed sending them until I could also send the Book. I saw Eusoof Khan yesterday, and told him that I would send the Book to you with the coins.

I remain, &c.
G. E. HOLLINGS.

Lucknow, 20th January, 1846.

The book has been sent to you by dák banghy to-day.

Read a letter from W. Knighton, Esq., Secretary to the Ceylon branch of the Royal Asiatic Society :—

To H. TORRENS, Esq. *V. P. and Secretary Bengal Asiatic Society.*

SIR,—I am directed by the Committee of Management of the Ceylon Branch of the Royal Asiatic Society, to acknowledge the receipt of your letter of the 20th October last, as also of the case of books, per Brig "Emerald," containing sets of the Asiatic Researches, and of the Journal of the Asiatic Society of Bengal, for all which I am directed to convey to you the best thanks of the Society.

It gives our Society great pleasure to find itself in co-operation with a body so distinguished by its success in Oriental Researches as the Asiatic Society of Bengal, and it is our hope that the anticipations expressed in your letter may not be disappointed.

I have the honor to be, &c.

WM. KNIGHTON,
Hon. Secy.

*Ceylon Branch Royal Asiatic Society, }
Colombo, 4th January, 1846. }*

The arrival in the river of the specimens, &c., from the Royal Norwegian University of Christiana was announced.

Read a letter from Col. Jackson, Secretary to the Royal Geographical Society, complaining of non-reciprocity in exchange of publications, and that the Geographical Society have been obliged to purchase copies of the Journal of the Asiatic Society up to and including No. 56, New Series, when with a view to necessary economy it was given up.

Resolved, that it be explained to the Royal Geographical Society, that the omission to exchange the Asiatic Society's publications for the Journals of that Society could only have arisen from some mistake, and

that the Secretary be instructed to forward to Col. Jackson the numbers of the Journal subsequently to No. 56.

Read a letter from Mr. H. Piddington, resigning the Secretaryship of the Burnes' Committee.

Mr. Heatly, as reporter to the Committee appointed last year to consider the feasibility and advantage to the Society of renewing its statistical researches, gave a verbal account of what had been done with a view to ascertain the assistance on which the Society might reckon. Extracts of a letter from Col. Sykes were read stating that the hearty co-operation of the London Statistical Society might be expected, and that the late measures of the Court of Directors were sufficient evidence of the favorable disposition with which it would be disposed to regard such labours on the part of the Asiatic Society.

The Rev. J. Long was then placed on the Committee of Report, in consequence of Mr. Alexander's departure to England.

For all the presentations and communications the best thanks of the Society were accorded.

Proceedings of the Asiatic Society of Bengal : MAY, 1846.

(*Wednesday Evening, the 6th May, 1846.*)

The usual monthly meeting of the Society was held at the Rooms on the above evening, at half-past eight, P. M.

S. G. T. Heatly, Esq., the senior member of the Committee of Papers present, in the chair.

The proceedings of the April meeting were read, confirmed, and directed to be published.

James Hume, Esq., was proposed for election as a member at the next meeting, by the Secretary and seconded by Mr. Heatly.

List of Books received for the Meeting of Wednesday the 6th May, 1846.

PRESENTED.

- 1.—Meteorological Register for March, 1846, from the Surveyor General's Office.
- 2.—The Calcutta Christian Observer for April and May, 1846. By the Editors.
- 3.—The Oriental Christian Spectator for April, 1846. By the Editor.
- 4.—Notes on the renewal of statistical researches by the Asiatic Society. By S. G. T. Heatly, Esq.
- 5.—Journal of the Bombay branch of the Royal Asiatic Society. By the Society.
- 6.—History of Ceylon. By the Author.
- 7.—Sketch of the religious Sects of the Hindoos, by H. H. Wilson, F. R. S. By J. Muir, Esq. C. S. (20 copies).

Books presented by the University of Christiana.

- 8.—Norsk Magazin for Laegevidenskaben udgivet af Laegeforeningen i Christiania, 1840 to 1844. 27 pamphlets.
- 9.—Nyt Magazin for Naturvidenskaberne udgives af den physiographiske Forening i Christiania, 1843 to 1845. 4 pamphlets.
- 10.—Enumeratio Plantarum Vascularium quae Circa Christianiam spoute Nascuntur Auctore M. N. Blytt. (2 copies.)
- 11.—Indere Scholarum in Universitate regia Fredericiana sexa gisimo quarto ejus semestri Anno : 1845 Ab A. D. XVII. Kal Februarias Habendarum. (3 copies.)

12.—Solennia Academica in Memoriam Sacrorum per Lutherum reformatorum ab universitate regia Fredriciana Die X. Mensis Novembris Celebranda indicit Collegium Academicum. 1842 and 1844 (2 copies.)

13.—Om de Sanitaire Forholde i Faengsler efter nyere systemer. Ved Professor Fred. Holst, M. D. 1840.

14.—Om Sygepleien i Straffeanstalterne i Norge Ved Professor Fred. Holst, M. D. 1841.

15.—Indistilling fra Strafanstatts Commissionen, 1 vol.

16.—Udkhast til Lov om Medicinal væsenet i Norge med Motiver, 1 vol.

17.—Holst om de Britiske Fængsler, 1 vol.

18.—Om Sindovages i Norge, 1 vol.

19.—De Acide Nitrei usa Medico Dissertatio, 1 vol.

20.—Det Kongelige Norske Frederiks Universitets Aarberetning for 1842, 1 vol.

21.—Berotningor om Den deconomiske Tilstand mm. (Statistics) i Norge, 1 vol.

22.—Ovissight over de af Amtmædedene af gione (Statistics). Rapporter, 1 vol.

23.—Registrum piodiorum et reditium adeilicious, &c. 1 vol.

24.—Fortegnelse over telstedevarende Studerende, &c. 1 vol.

25.—Statistic Tables illustrative of the Social of Norway, 6 vols.

26.—Beretning om Kongredt, &c. 1 vol.

27.—Cabeller, 1 vol.

28.—Eaca Norvigen, 1 vol.

29.—Foreningen for Norske fortids Mindesmarkers Bevaring, 1 vol.

EXCHANGED.

Asiatic Journal and Monthly Register for British and Foreign India, China and Australasia, vol. 10. (N. S.), January to April, 1833, vol. XI. May, 1833, and April to December, 1840 with supplement Vols. XXXI, XXXII and XXXIII.

The Athæneum, Feb. 7th, 14th, 21st and 28th and March 14th, 1846.

Journal Asiatique Quatrieme Serie, Vol. VI. No. 27. September and October, 1845.

The London, Edinburgh and Dublin Philosophical Magazine and Journal of Science, Third Series, No. 185, February, 1846.

PURCHASED.

North British Review, No. VIII. February, 1846.

Journal des Savants for Dec. 1845.

The Birds of Australia, by J. Gould, F. R. S. &c. Part XXI.

The Annals and Magazine of Natural History, No. 110, Feb. 1846, with Supplement, No. 108.

Read a letter from Capt. T. Latter expressing his wish to have corrected a misnomer in a late article, by him, in the Society's Journal. The passage occurs in No. 165, page 629, and the correction wished is

as follows: "*Dentals*. I have since learnt that this is a misnomer, the drop-shaped objects to which I refer being, I believe, styled *Guttæ*, from their supposed similarity to drops of water." Instructions were given accordingly.

Read the following extract of a letter, dated 23d March, 1846, from H. T. Prinsep, Esq., to the Secretary:

You may recollect that about a year ago, when I reported what had passed between myself and Baron Brunnow, the Russian ambassador, anent the proposed interchange of articles of Oriental literature, I mentioned a suggestion I had made for extending the interchange to mineral and other specimens that might conduce to advantageous comparisons between the Altai and Himalaya mountains.

A few days ago I saw the Secretary of the Russian legation, and he put into my hands the enclosed as the result of my suggestions. You will see that the Russian authorities profess a willingness to entertain the proposition, and refer me to Col. Helmerson, with whom the manner of carrying it out is to be arranged. I have yet had no communication with the Colonel, and I learn that he will not be in England till August or September. In the meantime I think it right that you should know what is in agitation, that you may bring the subject before the Society, and with Mr. Piddington's aid, and that of other scientific proficients in the department point out what classes of specimens you most wish to procure from Russia, and what you can furnish out of your own duplicate stores. At the suggestion of Baron Brunnow, I called upon Mr. Murchison, in order to talk over the subject with him, but found he was not prepared to make any specific suggestions as to the articles first to be interchanged. Expense I pointed out was a consideration on your side, but if the Russian authorities would be content with the duplicates of what we had in store, this consideration would not apply, so much as if we were to collect new specimens, and in this case there must be delay. However, I should be glad to learn the views taken of this matter by the scientifics of Calcutta.

I have had a summons to sit for completion of my picture to-morrow; it has been untouched for more than a year in consequence of the painter's (Mr. Say) serious illness * * I guess it will now very shortly be completed, perhaps in time for exhibition, but that is uncertain.

The Royal Asiatic Society will have out very shortly Col. Rawlinson's arrow-headed inscriptions from Behistoor, and Mr. Norris's reading of the Kupoordigeri, (rock inscription.)

Both are highly interesting, the first the most wonderful that has ever been found and deciphered.

The communication from Baron Ouwaroff to Baron Brunnow, referred to in the above extract, was also read and is as follows:—

MONSIEUR LE BARON,

Par l'office du 13th Avril, 1844, sub No. 40. Votre Excellence a bien voulu me communiquer la proposition de Mr. Prinsep établir entre les Musées de St. Petersburg et de Calcutta, un échange de fossiles et de produits mineralogiques, ains que la lettre qu'il vous a adressé a ce sujet. Je me fais un devoir de vous instruire que j'ai eu l'honneur de soumettre cette proposition a Monseigneur le Duc de Leuchtenberg ; le corps des mines et ses riches collections des mineraux, se trouvant sous les auspices et la direction immediate de Son Altesse Imperiale. Son Altesse a daigné me répondre qu'Elle n'a aucune objection à entrer dans un pareil arrangement et qu'Elle accepterait tous les echanges qui Lui seront offerts par le Musée de Calcutta ; en y ajoutant, qu' Elle approuve fort ce systeme, qui est en pleine vigueur dans l'établissement, que Monseigneur dirige. L'Académie Imperiale des sciences, a laquelle j'ai communiqué en meme temps la proposition de Mr. Prinsep, vient de me presenter son rapport à ce sujet. De son avis un pareil échange ne peut être que très utile au Musée minéralogique de l'Académie.

En Vous faisant part, Monsieur le Baron, des mesures que j'ai prises, je crois de mon devoir de Vous instruire, que l'Académie des sciences, ayant en vue l'achèvement d'un nouveau catalogue des mineraux de son Musée, ne manquera pas de charger son Adjoint, le Colonel Helmerson de se mettre en rapport direct avec Mr. Prinsep.

Je me plais à espérer que Votre Excellence voudra bien prêter son assistance bienveillante à ces relations qui certainement ne laisseront que de contribuer à enrichir les collections minéralogiques de l'Empire de Russie.

Veillez, Monsieur le Baron, agréer l'assurance renouvelée de ma considération très distinguée.

OUWAROFF.

St. Petersburg, ce 31 Janvier, 12 Fevrier, 1846.

Some conversation took place as to the best mode in which the Society could reciprocate Mineralogical and Geological specimens with the Russian Government, a conversation which ended with instructions to the Society's Curator in that department to report on the subject, with special reference to the duplicates in the ability of the Society to devote to such exchange. It was particularly suggested by Mr. Blyth, and approved by the Society, that application should be made for casts of the most remarkable specimens of fossils in the Imperial Museum of St. Petersburg, together with such original specimens, as could be spared, of the more common species. Mr. Blyth offered on his own part to draw up a list of various zoological specimens from northern Asia, the possession of which and comparison of them with Himalayan specimens might

throw much light on many doubtful points. The offer was accepted with thanks.

Read a letter from Lieut. Yule accompanying a paper entitled, "A Canal Act of the Emperor Akbar, with some notes and remarks on the history of the western Jumna Canals, by Lieut. Yule, Bengal Engineers, First Assistant W. J. C. Thanks were specially returned for the contribution, and it was ordered for publication in the Journal.

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

To H. W. TORRENS, Esq. Vice President and Secy. Asiatic Society of Bengal.

MY DEAR SIR,

The subject briefly proposed in the following letter from the "*Friend of India*" of the 26th ult. seems well worthy the notice of the Asiatic Society. Our immediate province, no doubt, is to discover and describe whatever the past has produced or the present possesses, of the beautiful, curious, or interesting in art, literature, or natural phenomena. But the reproduction and development of the scattered elements of Hindu architecture in the way proposed in the letter, is very closely connected with our professed objects, even in their most confined and literal sense; inasmuch as nothing could conduce so greatly towards the formation of vivid conceptions of the past as the revival of its forms in our modern works of art.

These considerations, with the others urged in the letter, appear to me to give the subject a strong claim on the attention of the Society, and on such efforts as our association may properly make for the furtherance of such objects.

"SIR,—When the construction of such buildings as the Kishnaghur College is in contemplation, it appears to be a favourable time for considering whether we could not do something towards perpetuating and improving the old national architecture of India. That the elements of this style have already been combined in structures of considerable beauty may be seen from the specimens given in Col. Tod's work on Rajasthan, among which the ancient Jain Temple, of the interior of which a drawing is given at page 778 of the 1st Vol., is deserving of particular mention; and that these elements are capable of being united in a manner suited to compose an extensive building, and without any such profusion of minute ornament as would render the adoption of this style more expensive than any other, I have been informed by a high architectural authority. It is even probable that the style may be developed by persons of taste into combinations more beautiful than it ever assumed under the hands of its original inventors, or their successors. However this may be, it appears to be only due to the Hindus to gratify their natural predilections in favour of any thing national by constructing after this model any buildings to which it may be properly applicable from use or association. Such a course would no doubt interest and gratify the people of this country, in a way too, which would involve no sacrifice of principle on our parts; a result which it is often difficult to attain

“ when we would endeavour to conciliate their good will. And to descend to a lower consideration, this appeal to the national feelings of the natives might have the effect of inducing them to subscribe more liberally in cases where it was employed.

I remain, my dear Sir, your's truly,

Azinghur, April 21, 1846.

J. MUIR.”

The meeting fully concurred in the view taken by Mr. Muir, and the Secretary was requested to call the attention of Capt. Kittoe, the author of an able work on Indian Architecture, to the subject.

The Secretary exhibited to the meeting a sectional sketch of the borings lately made in the beds of the Soane River by Mr. F. De Garnier, Engineer to the East India Railway Company, during the survey carried on by that Company. The sketch, together with a memorandum explanatory of it, was referred for publication in the Journal.

Read the following extract of a letter from Walter Elliott, Esq. C. S. dated Madras, May 1st, 1846.

“ I have now got my Buddhist sculptures safely landed and deposited in the College, after great trouble and difficulty in transporting such heavy blocks down the Kistna to Masulipatam and thence by sea to Madras ; some of them weigh upwards of two tons, and the expence has far exceeded what I bargained for. I am now engaged in trying to get a sketch of the Dehgope restored, and I am sanguine of succeeding. The volume of McKenzie's drawings is invaluable, and I am happy to say that from it I have ascertained that many of the finest sculptures are still in existence at Masulipatam, where they have passed into the hands of an individual, who however has no right to them, and they may be recovered.”

Read a letter from Dr. Taylor, dated Dacca, April 16, 1846, accompanying a paper, entitled “ Remarks on the Sequel to the Periplus of the Erythræan Sea, and on the country of the Seres, as described by Amianus Marcellinus.” The special thanks of the Society were ordered to be returned for the contribution, and the paper was referred for publication in the Journal.

Read the following extract of the letter dated Almorah, 6th April, 1846, from E. Madden, Esq.

“ I think it was in the 17th ultimo I had the pleasure to address you relative to the diary of a trip over the snowy range near Simla, made by me last season, and which I proposed to transmit to you for insertion in the Journal of the Asiatic Society of Bengal.

* * * * *

I think it best to forward the paper to you, with the request that should it not

suit the purposes of the Society, you would be good enough to return it to me at your earliest convenience."

The thanks of the Society were ordered to be returned for the contribution, and the paper was referred for publication in the Journal.

The Secretary, with reference to the recent completion of the *Tareekh-i-Nadiree*, read the following preface :—

The text of this work has been prepared by careful collation with a number of manuscripts of the *Tareekh-i-Nadiree*, procured from various quarters, the best of which were two manuscripts brought by Major William Anderson, C. B. from Candahar, and two kindly lent by Nawabs Busheer-ood-deen and Ruheem-ood-deen, grandsons of Tippoo Sultan. I have likewise to express the acknowledgments of the Society, for the loan of manuscripts, to Hajee Kurbelai Mahommed, of this city, Hafiz Uhmud Kubeer (Principal of the Calcutta Madrussah), Molvee Abdool Wahab, (Meer Moonshee to the Government of India), and other gentlemen. The manuscripts were, even Major Anderson's, more or less defective, and it would have been impossible to produce a good edition of the work without the examining and collating at least twelve different copies, so incorrectly did the work seem to have been generally preserved. Among the manuscripts was a translation of the work into Oordoo by Moonshee Syud Hyder Bukhsh, belonging to the Library of the Society, which was to a certain degree useful, as respected the collation of the narrative.

The rough draft or first editing of a manuscript from all the copies of the work available, was undertaken by Molvee Gholam Ukbur, Persian Librarian to the Society; who aided by some literary friends, executed this task with great patience, and much ability. The five best manuscripts were then taken, and the collated work was gone through, and carefully compared by me with them in conjunction with our Librarian for the purpose of selecting preferable readings, any question of doubt being referred to Hafiz Uhmud Kubeer, and the professors of the Calcutta Madrussah.

Molvee Gholam Ukbur then prepared a rough vocabulary of the Toorkee words occurring in the manuscript, which, principally by the aid of a gentleman named Shah Oolfut Hoossein, was finally put into its present shape. I have been careful to record the names of those gentlemen, by whose gratuitous aid the difficult work of preparing a good copy of the *Tareekh-i-Nadiree* has been principally accomplished, as feeling that this at least was due to them, the Asiatic Society of Bengal being so mainly indebted to their labours for the production of a work long called for, and much valued, in a complete and creditable shape.

H. TORRENS,

Vice President and Secretary,

Asiatic Society of Bengal.

The following memorandum was read, enumerating the Oriental publications of the Society sold during the month of April, 1846 :

Naishada (one copy)	6	0	0
Index to the Mahabharata Vols. 1, 2, 3, 4.....	6	0	0
Fatwa Alemgiri 1 Vol. 2 copies	}	152	0 0
" " 2 " 2 " 			
" " 3 " 3 " 			
" " 4 " 4 " 			
" " 5 " 4 " 			
" " 6 " 4 " 			
Harriwansa, one copy	5	0	0
Tariki Nadiri, one copy	8	0	0

Total.. Co.'s Rs.... 177 0 0

KISSORY CHAND MITTRA,

Librarian and Asst. Secy.

A library order, was then read out, for the information and sanction of the meeting, giving Babu Kissory Chand Mittra, the Officiating Librarian and Assistant Secretary, three months leave of absence on urgent private affairs, and appointing Babu Rauj Krishna Mittra to act for him.

The Secretary explained the absence from the meeting of the Society's Geological Curator, as arising from recent and severe indisposition. The usual report of the Zoological curator, on the acquisitions to his department during the month, was then verbally delivered.

At the conclusion the Secretary exhibited a curious and interesting painting of Raja Kissen Chunder Roy, Bahadoor and his principal officers, which had been copied from the original in possession of the Raja's present representative, the Raja of Nuddeah.

For all presentations the thanks of the Society were ordered to be returned.

Proceedings of the Asiatic Society of Bengal, JUNE, 1846.

The ordinary meeting of the Society for the month was held, as usual, at the Society's Rooms, at 8½ p. m. on Wednesday, the 3d June.

The Rev. Dr. Hæberlin occupied the chair as Senior member, present, of the Committee of Papers.

James Hume, Esq., proposed at the last meeting, was duly balloted for and elected a member of the Society. The usual communications were ordered on the occasion.

The minutes of proceedings at the May meeting were read, confirmed and ordered to be published.

Read the following list of additions to the library during the last month :—

PRESENTED.

1.—La Rhétorique des Nations Musalmanes, d'après le traite Persian, intitulé, <i>Hadayik-ul-Balaghat</i> . Par M. Garcin de Tassy, Membre de l'Institut, &c. —From the AUTHOR.	1
2.—A Primer of the Seelong language.—From GOVERNMENT.	1
3.—The History of the British Empire in India, by Edward Thornton, Esq., author of "India, its state and prospects," &c.—From GOVERNMENT. . . .	5
4.—A Gazetteer of the countries adjacent to India on the North-west; including Scinde, Affghanistan, Beloochistan, the Punjab and the neighbouring States. Compiled by the authority of the Honourable Court of Directors of the E. I. C., and chiefly from documents in their possession, by Edward Thornton, Esq.—From the GOVERNMENT.	2
5.—History of the Batavian Society of the Arts and Sciences. By Dr. S. J. Budding.—From the AUTHOR.	1
6.—Journal of an Experimental Voyage up the Ganges, on board the H. C. Steamer <i>Megna</i> . By Capt. Digney, commander.—From GOVERNMENT. . .	1
7.—Meteorological Register for April, 1846.—From the SURVEYOR GENERAL'S OFFICE.	1
8.—Calcutta Christian Observer for June, 1846.—From the EDITORS.	1
9.—Oriental Christian Spectator for May, 1846.—From the EDITOR.	1

EXCHANGED.

10.—Journal Asiatique : quatrieme serie, tom. VI. Nos. 28 and 29, Novembre et Decembre, 1845.	2
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- 11.—London, Edinburgh and Dublin Philosophical Magazine; 3d series, No. 186, March, 1846. 1
- 12.—The Athenæum, March 21st, 1846. 1

PURCHASED.

- 13.—Annals and Magazine of Natural History, No. 111, March, 1846. 1

Ordered that the unbound books be bound as soon as possible.

Read a letter from C. Beadon, Esq. Under Secretary to the Government of Bengal, accompanying a presentation to the Society, from the Government, of a Primer of the Seelong language, forwarded by the Commissioner of the Tenasserim Provinces, together with a copy of that officer's letter containing some account of the Seelongese.

Ordered that the paper on the Seelongese be referred for publication in the Journal.

Read a letter dated 11th February, 1846, from C. Beadon, Esq., Under Secretary to the Government of Bengal, forwarding for publication in the Journal, copies of a correspondence regarding some samples of coal discovered by Lieut.-Col. Ouseley, Agent to the Governor General and Commissioner on the South-west Frontier.

Ordered that the correspondence in question be referred to the Curator in the Mineralogical department for report.

Read the following letter from J. Thornton, Esq., Secretary to the Government of the North-western provinces.

No. 455.

FROM J. THORNTON, ESQ. *Secretary to Government, North Western Provinces,*
to H. TORRENS, ESQ. *Secretary to the Asiatic Society, Calcutta.*

GENERAL DEPARTMENT, N. W. P.

SIR,—I am desired to request that you will lay before the Asiatic Society, the accompanying report on the Cave Temples at Kallinjur, in Bundelkund, prepared by Mr. Rose, dated September 15th, 1845. Ensign Maisey, of the 67th Native Infantry, at the instance of Mr. H. Rose, C. S., Extract paras. 1, 4 of Mr. Rose's letter of May 6th, 1846. Magistrate and Collector of Banda.

Mr. Maisey's Report in Original.
Inscriptions, }
Drawings, } Original.

Copy of Mr. Rose's notes.

2. The Society will perceive that these researches have been prosecuted in pursuance of the Instructions of the Honourable the Court of Directors, dated May 29th, 1844, on the subject of antiquities of this

nature. The sudden summons of this enterprising young Officer, Ensign Maisey, to march with his corps to the frontier, during the late war with the Sikhs, interrupted his operations, and left them in a very incomplete state. There is, however, good reason to hope that he will be able to renew his enquiries during the next cold season.

3. In the mean time the Lieut.-Governor believes that he is best consulting the wishes of the Honourable Court in forwarding to the Society this incomplete account, in the hope that if they consider it worthy of publication they will give it a place in their Journal. The progress which has been made will thus not be lost, and this curious series of temples will, at any rate, be prominently brought to the notice of those who are skilled and experienced in such researches.

4. The Lieut.-Governor begs to be favored with 50 Copies of any publications on the subject which the Society may put forth.

I have the honor to be, Sir,

Your most obedient servant,

J. THORNTON,

Secretary to Government, North Western Provinces.

Agra, the 19th May, 1846.

Ordered that the special thanks of the Society be returned for the communications above alluded to, and that they be published in an early number of the Journal.

Read the following extract of a letter to the Secretary from the Hon'ble J. Thomason, dated May 13th, 1846.

I hope to be able to send you soon another interesting account of a number of Buddhist cave temples or monasteries discovered at a place called Mundab in the Rewah country, about 100 miles due south of Mirzapore. I know not whether the existence of these caves has ever been mentioned before. There are several of them. From the drawings I have seen, they are like the Vihara caves of Central India, but as yet no inscriptions have been found.

Read a letter from Dr. Wise, dated Dacca, 23d February, 1846, apprising the Secretary of the despatch of the copies of his Commentary on the Hindu System of Medicine, which were subscribed for by the Society. Dr. Wise further stated the price to be ten rupees a copy.

Read the following extracts of a letter to the Secretary from Mrs. Ballin:—

I beg to send Mr. Ellis to receive your orders respecting the remaining sets of drawings of Sir A. Burnes' work (6 in number) which are to be rectified, and also for the 7 sets that have been at the Society's rooms since February last for examination.

I beg leave to bring to your notice, that more than three years have expired since these drawings were originally sent by me for examination, and it was only within

the last year that they or some of them were given back to me to be rectified. The length of time therefore the paper has been kept makes it a difficulty to remove the color already used, and consequently I have been put to an additional expense to have the drawings retouched which would not have been the case had they been returned to me in proper time.

The Secretary expressed his regret, that in consequence of Mr. Piddington's resignation of the Secretaryship to the Burnes' Committee, a full report is not yet ready for submission.

Read a letter from Mr. Piddington, the Secretary to the Dwarkanath Testimonial Committee, presenting to the Asiatic Society, on the part of the committee and subscribers, a framed proof engraving of Babu Dwarkanath Tagore.

Ordered that the thanks of the Society be returned to the Committee for its kind attention.

Read the following list of Oriental publications sold :—

Memorandum of the Oriental Publications sold in the month of May, 1846.

Rája Tarangini, (one copy), @ 5,	5	0	0
Mahabharata,			
1st Vol. 1 copy	} 5 copies, @10.....	50	0 0
2d ditto 1 copy			
3d ditto 2 copies			
4th ditto 1 copy			
Index to Mahabharata,			
1st Vol. 2 copies	} being 8 copies, @ 1-8.....	12	0 0
2d ditto 2 copies			
3d ditto 2 copies			
4th ditto 2 copies			
Asiatic Researches,			
Vol. 19, part 2-1	} being 2 copies, @ 5.....	10	0 0
Vol. 20, part 1. 1			
Journal of the Asiatic Society,			
Nos. 158, 162, & 164 being 3 copies, @ 2.....	6	0	0
Nos. 156 to 162, being 7 copies, @ 1-8.....	10	8	0
	Co's. Rupees,		93 8 0

RAUJ KRISHNA MITTRA,

Officiating Librarian and Assistant-Secretary Asiatic Society.

Asiatic Society's Rooms, 31st May, 1846.

Some general conversation having taken place on the propriety and expediency of selling the Oriental Publications of the Society to Scholastic institutions at reduced prices it was formally

Moved by the Chairman, seconded by the Secretary, and unanimously resolved :—

That all educational institutions should be supplied with the oriental publications of the Society at half the price they are sold to others.

Read a report from Mr. Tucker, the Librarian to the Medical and Physical Society, stating that the instructions of the Secretary to remove the books of the Medical Society into the Library of the Asiatic Society have not been entirely carried out from want of room ; two more shelves being requisite.

Ordered that the shelves required be sanctioned.

Read a letter, dated Batavia, 18th April, 1846, from Dr. S. J. Budding, to the Society, accompanying the gift of his “ History of the Batavia Society of Arts and Sciences from 1778 to the present day.”

Ordered that the thanks of the Society be returned to Dr. Budding.

Read a letter, dated London, 30th March, 1846, from Mr. Hugh Cumming, apprising the Secretary that he had forwarded by the *Essex* parts 13 to 36 of Reeves’ *Iconica Conchologica*, and parts 4 to 6 of Sowerby’s *Thesaurus*, subscribed for by the Society. Mr. Cumming likewise renewed his request for duplicates of shells from the Society’s Museum.

Ordered that the letter be made over to Mr. Blyth.

Read a letter from Mr. Blyth to the Secretary, requesting the appointment of guards over the rooms of the Museum, additional assistance in the taxidermist’s department, and an augmentation of salary for his assistant Mr. Roberts.

Ordered that the propositions of Mr. Blyth be referred to the Committee of Finance for report.

Proposed by Capt. Marshall, seconded by the Secretary, and unanimously resolved :—

That the names of Dr. Hæberlin and of R. W. G. Frith, Esq., be added to those already on the Committee of Finance.

Read the following Report for May, 1846, by the Geological Curator.

GEOLOGICAL AND MINERALOGICAL.

Dr. Bradley, Nizam's Service, Ellichpoor sends us some concretions which he supposes to be coprolites, and adduces them as "one of many corroborative proofs that their sandstone rocks are identical with the new red sandstone of England."

I find, on dissection with dilute muriatic acid, that the grey ones are *now* merely calcareous concretions of silica and apparently fragments of flint, and the red ones ferruginous concretions, also of siliceous matter, coloured almost to heliotrope by peroxide of iron, but yielding this after some days digestion in muriatic acid. The white concretionary matter is apparently also siliceous, as these red specimens give but very little effervescence.

I am thus on the whole (and especially by comparison with our own specimens from Dr. Buckland) inclined to think that these are not coprolites, nevertheless I would not speak positively at present.

Dr. Bradley has also sent us a specimen of a silicified substance which he thinks must once have been an organic body, and he states that Professor Orlebar, of Bombay, also agrees with him in this opinion. It is at present a pure chalcedony, whatever it may formerly have been.

I have the pleasure to announce a valuable addition to our collection in a meteorolite of a good size, discovered amongst a pile of specimens, without labels or numbers, in the Coal Committee's collections, which I have been busy in arranging. I trust to obtain yet some notice of this valuable treasure, which for us is truly one, for it is of a kind which we had not yet so perfect in the curious marbling which it presents on fracture. I have not had time to look for the different descriptions of these substances so as to see if any are described resembling it.

MUSEUM OF ECONOMIC GEOLOGY.

As I have only been convalescent in the latter part of this month I must defer till the next report noting what I have been able to do.

For all the presentations and communications the thanks of the Society were accorded.

Proceedings of the Asiatic Society of Bengal, JULY, 1846.

The ordinary meeting for the month was held, as usual, at the Rooms, on Wednesday the 1st July, at $\frac{1}{2}$ past 8 P. M.

The Rev. Dr. Hæberlin occupied the chair, as senior member present of the Committee of Papers.

The minutes of proceedings at the June meeting were read, confirmed and ordered to be published.

The following gentlemen were proposed for election at the next meeting :—

A. Mitchell, Esq., Proposed by T. W. Laidlay, Esq., seconded by E. Blyth, Esq.

E. A. Samuells, Esq. proposed by B. Colvin, Esq., seconded by H. Piddington, Esq.

Read the following list of additions to the Library during the last month :—

PRESENTED.

1.—Report of the Committee for the investigation of the Coal and Mineral Resources of India, May, 1845. BY THE GOVERNMENT. Two copies, fol...	2
2.—Remarks on the Scope and Uses of Military Literature and History.—BY THE AUTHOR,.....	1
3.—Philosophical Transactions of the Royal Society of London for 1845, (part II.)—BY THE SOCIETY.....	1
4.—Proceedings of the Royal Society ; No. 60, (1844) and 61, 62, (1845).—BY THE SOCIETY.....	3
5.—List of Members of the Royal Society (30th November, 1845).—BY THE SOCIETY.	1
6.—Journal of the Agricultural and Horticultural Society of India. (Vol. V. part II.)—BY THE SOCIETY,.....	1
7.—Meteorological Register for May, 1846.—BY THE SURVEYOR GENERAL'S OFFICE.	1
8.—Oriental Christian Spectator for June, 1846.—BY THE EDITOR.....	1

EXCHANGED.

9.—Journal Asiatique : quatrieme serie, tome VII. Nos. 30 and 31. Jan. et Fev. 1846.	2
10.—Edinburgh New Philosophical Journal, No. 80, April, 1846.	1

11.—London, Edinburgh and Dublin Philosophical Magazine, No. 187, April, 1846.	1
12.—The Athenæum, No. 966, 2d May, 1846.	1

PURCHASED.

13.—Annals and Magazine of Natural History, No. 112, April, 1846.	1
14.—The Classical Museum, No. XI.	1
15.—Religions de L'Antiquité, (one copy).	6

Ordered that one of the two copies of the Coal Committee's Report, presented to the Society, be made over to the Geological Curator for the use of his department.

Some conversation having arisen on the subject of the resolution come to at the last meeting, with reference to the sale of oriental publications to educational establishments, it was resolved further that the Council of Education should be formally made acquainted with the determination of the Society, and the Secretary took it upon himself otherwise to diffuse a knowledge of it as widely as he possibly could among the public.

Read a letter from J. Agabeg, Esq., dated 11th June, 1846, presenting a model of a Cingalese boat to the Society.

Ordered that the thanks of the Society be returned to Mr. Agabeg for his donation.

Read the following letters from Messrs. Allen and Co. relative to matters connected with their agency.

HENRY TORRENS, ESQ., *Secretary of the Asiatic Society of Bengal.*

SIR,—We have received your favour of the 3d September, ordering us to return to India about half the stock of the Asiatic Researches received from Mr. John Murray in March, 1844.

We have had the volumes named in your letter divided into equal proportions, in case of accident to the vessel, and have shipped one portion packed in six cases, by the *Euphrates*, Captain Wilson, and for which we beg to enclose a Bill of Lading. We annex a memorandum of the cost of the cases and the shipping expenses upon them, amounting to £18.2, which sum we shall place to the debit of the Society. The Researches were received from Mr. Murray in sheets, and in the absence of instructions, we have not thought it advisable to subject the Society to the expenses of binding so large a number of volumes without orders to that effect.

The shipment has not been insured, but should you think it necessary it can be done in Calcutta upon the receipt of this advice nearly as cheap as it could have been effected here.

The second portion of the Researches will be forwarded by the next vessel to Calcutta; should you think it necessary to effect insurance, both shipments may be done at the same time, as the next will be a duplicate of the present.

We shall be obliged by your saying what we are to do with the Researches that will, after the second shipment, still remain on our hands; we have some time since expressed our inability to dispose even of one set, and were the Researches advertized we fear the result would not be satisfactory. We shall have no objection to continue the care of the Researches, but if we cannot make sales it is only reasonable that we should charge ware-house room for the Books,—we shall be much obliged if you will consider the subject and let us know what you think should be done.

We have the honor to be, Sir,

Your faithful Servants,

W. H. ALLEN AND CO.

London, 3d December, 1845.

TO HENRY TORRENS, ESQ. *Secretary to the Asiatic Society, Calcutta.*

SIR,—We have the pleasure to enclose you Bill of Lading for a case of Books, consigned to you on the "*Samarang*," Captain W. Buckle, for, and on account of, the Society:—This case was forwarded to us, from Rotterdam, without any advice, a Bill of Lading having only reached us through the broker. As the least cost to the Society, we had it bonded for exportation, and now hand you the total cost of charges incurred, £ 4 13s. 6d. We have thought it right to insure the package in the sum of £50. We shall be obliged by your instructions as to any future packages, that may reach us in the same manner.

Your favor of the 8th December last, verifying our account to the 30th of June, has been received: the balance, after the payment by us for the bust of Mr. Hodgson, being £ 14 1s. 9d. in our favor.

Mr. Francis Grant has completed a portrait of W. W. Bird, Esq. for the Society; his charge for which, including case and packing, has been one hundred and fifteen pounds (£ 115); to this we shall have to add shipping expences, freight and insurance, amounting, to about £ 10 or £ 11 more. We doubt not the Society will enable you to remit us a bill on account. We have had the advice and assistance of Mr. Bird, in the selection of the artist, and we trust the Society will be pleased with the striking likeness to the original. Bearing in mind that if this portrait was to be now shipped, it would arrive at the worst part of the year, Mr. Bird has agreed with us, as to the propriety of not sending it out until the departure of one of the last best ships of the season: we shall thus ship it so as to arrive out after the rains, and we trust the Society will approve of the same.

We have the honor to be, Sir,

Your most obedient servants,

WM. H. ALLEN AND CO.

7, Leadenhall Street, London, April 18th, 1846.

ASIATIC SOCIETY, CALCUTTA, TO WM. H. ALLEN AND CO.

Paid Disbursements, Freight, &c. on a Case of Books weighing 113lbs. received per <i>Giraffe</i> from Rotterdam,	0	17	0
Entry, Warehousing, Lighterage, Wharf Charges, Shipping Expences, Bonding and Cartage to the Docks, shipping the above per <i>Samarang</i> ,	1	12	0
Bills of Lading, Freight, and Insurance on £ 50,	2	4	6
			£ 4 13 6

(Signed)

WM. H. ALLEN AND CO.

ASIATIC SOCIETY, CALCUTTA, TO WM. H. ALLEN AND CO.

5 Asiatic Researches, Vol. 1, 4to.	5 Asiatic Researches, Vol. 14.
2 Ditto Vol. 2.	50 Ditto Vol. 14, 4to.
40 Ditto Vol. 10.	25 Ditto Vol. 6, 4to.
50 Ditto Vol. 7, 4to.	30 Ditto Vol. 8, 4to.
50 Ditto Vol. 9, 4to.	100 Ditto Vol. 12, 8vo.
7 Ditto Vol. 13.	13 Ditto Vol. 12, 4to.

Charges.

Six Cases for packing lined with Tin, 1 to 6, at 33s. each,	9	18	0
Packing and examining the same,	1	12	0
Entry, Cartage to the West India Docks, Wharf Charges, Shipping Expences and Bills of Lading,	2	7	0
Freight and Primage,	4	5	0
			£ 18 2 0

(Signed)

WM. H. ALLEN AND CO.

Read a letter from C. Beadon, Esq., Under Secretary to the Government of Bengal, dated 17th June, 1846, and its two official enclosures, announcing a donation to the Asiatic Society of a copy of the "Natural History of New York," in ten volumes quarto, with a geological map accompanying, by the Regents of the University of the State of New York, *ex officio* "Trustees of the State Library, acting as the representatives of the State." The remaining volumes of the undertaking when completed are promised to be duly forwarded.

Read a letter from S. Hunter Christie, Esq., Secretary to the Royal Society, dated 20th March, 1846, expressing the thanks of that Association for the volumes of the Journal presented to it by the Asiatic Society, and requesting the Society to complete the set by despatch of volumes I, II, VIII; of Nos. 21 to 24 (inclusive) of volume IX. (1840); and

of Nos. 25 to 29 (inclusive) of volumes X. (1841). Ordered that the volumes in question be forwarded to the Royal Society.

Read a letter from Dr. Martius, Secretary to the Mathematical and Physical Class of the Royal Academy of Munich, dated 6th April, 1846, thanking the Asiatic Society on the part of the Academy for the present of a set of its oriental publications, and announcing that the Academy has despatched in return a set of its Memoirs and a selection of such of the smaller Academical publications as it judges convenient for the purpose of the Asiatic Society. The communication went on to state that at the request of the Academy, the Royal Mining department of Bavaria had made over to it, for the Society, "three chests containing échantillons of the Bavarian carboniferous formations, and of the Loess formation of the Rhine;" and a further collection illustrative of the Trap formation in the neighbourhood of Bonn from the Siebengebirge, is promised. Dr. Martius likewise presents on his own behalf a copy of his "*Systema materiæ medicæ vegetabilis Brasiliensis*," and on behalf of Professor von Kobell, a copy of a memoir by that learned gentleman on Galvanographics.

Read the following letter addressed to the Curator of the Zoological department, whose exertions in opening out new channels of scientific intercourse with foreign institutions received the expression of the Society's great satisfaction on the occasion.

EDWARD BLYTH, ESQ., *Asiatic Society's Museum, Calcutta.*

MY DEAR SIR,—So long a period has elapsed since you were kind enough to forward to us a collection of your indigenous birds, that I almost fear you may have forgotten the circumstance.

The packages, two in number, you entrusted to the care of Mr. G. Sandeman; but I am sorry to say, by what accident I know not, the first only reached us eighteen months after its shipment; and the second (containing specimens of aquatic Birds), only four months ago. The specimens contained in the first case received were truly gratifying, and will form a very desirable and pleasing addition to our Museum; but I regret to say that, from some uncommon mismanagement in the transit, the second case, when opened, was found to contain nothing we could make available. This we truly regret, as the subjects were very valuable and appeared to have been prepared with great care.

The Committee direct me to convey to you our most cordial thanks for your liberality and attention to us; and to assure you of our desire to reciprocate with you in the natural productions of our respective countries.

The circumstances of the times, which have pressed so severely upon the private interests of our colonists, have not been favorable to objects of a purely scientific nature ; but even in the dawn of a more prosperous era, the desire to promote the interests of science has been peculiarly evinced in our legislative assembly, by a liberal grant having been passed during their last session, for the exclusive purpose of erecting a suitable building as a *Museum*, and it is now in the course of erection. I am also happy to say that the very general interest displayed by all classes in the success of this establishment, affords a well grounded hope, that the natural productions of this vast country, of all kinds, will soon be made acceptable for the advancement of science in every department of Natural History.

I would beg to explain to you, that hitherto our committee have had many and insurmountable difficulties to contend with. We have not had the advantage of any building in which our specimens could be properly displayed, or even adequately preserved. Under these circumstances it could not be expected that any great interest in the Museum would be evinced by the colonists ; and although we have received, from time to time, many valuable contributions from individuals, we cannot boast of that general support of which we now feel confident. As a small return for your very liberal present, I am now directed to forward for your Museum, as per accompanying list, such specimens of our Birds, &c., as we have at our immediate disposal ; but I am to assure you, that such as you have desired, which are not now sent, shall be carefully kept in mind, and, together with such others as we may consider will be gratifying to you, they shall be forwarded with the least possible delay. I entertain a hope that the recently established traffic in horses between this country and Calcutta, will afford us increased opportunities for communication. The recent discoveries of my friend Dr. Ludwig Leichardt, who has just returned from an overland journey from *Moreton Bay* to Port Essington, during which he discovered vast tracts of fine country closely bordering on the eastern Coast of Carpentaria, cannot fail of, ultimately, establishing a close connection between this country and India.

With regard to those objects of Natural History with which you might be able to favor us, our Committee desire me to say that while any thing you may send will be highly acceptable to our young Museum, yet we should be still more highly indebted for specimens of the larger Pachydermata and Carnaria peculiar to India, with the forms of which our younger population are quite unacquainted. Specimens of the Lion, Tiger, Bear, Rhinoceros, Elephant, &c., would attract general notice ; for any of these you are so obliging as to send we shall be particularly grateful.

In order to secure greater attention to the package we are sending, I have had it handed over to the charge of the Chief Officer of the *Stratheden*, which vessel is freighted for the service of your Government and will sail in a few days. I send this letter by the "*Lloyd's*." Pray look out for the arrival of the *Stratheden*.

I have also sent in the Box, a brief account of Dr. Leichardt's journey, drawn up

by himself, and printed here to afford immediate gratification to public curiosity. It will, I dare say, be interesting to your society.

Hoping to have the pleasure of hearing from you again,

I remain, my dear Sir, yours very faithfully,

ROBERT LYND,

Hon. Secretary to the Committee.

Australian Museum, Sydney, April, 1846.

Read the following letter from W. W. Bird, Esq. :—

TO HENRY TORRENS, ESQ., *Vice-President and Secretary, Asiatic Society of Bengal.*

SIR,—I beg leave to acknowledge the receipt of your letter dated the 7th of November last, forwarding to me a diploma from the Royal University of Norway, and to express a hope that as this high compliment has been paid to me in consequence of the proceedings of the Asiatic Society of Bengal, at a time when I had the honor of filling the office of President, the Society will do me the favor of communicating to the University my grateful acknowledgments for the same, and how deeply I feel the distinction conferred upon me by so flattering a mark of its approbation.

I have the honor to be, Sir, Your obedient Servant,

W. W. BIRD.

Paris, 21st April, 1846.

Read a letter from Captain Kittoe, enclosing a paper for the Journal and a memorandum relative to a singular custom at Lahore. It runs as follows :—

I send a few lines on a subject which I believe to be interesting to many of your readers. It is a hurried affair, as I have little leisure, and what I have is grudging. Saroda Pursad may make out the words of which I send *fac-similes*. They are, I expect, technical terms. The numerals are clear enough.—The memo. on the curious custom at Lahore (which I believe is an ancient Hindu one) may be acceptable.—I hope to send a paper on a curious discovery I made here [Shergotty] last year, of a Hindoo temple, 460 years old, with Cufic inscriptions, which no doubt have led to its being spared by the Mahommedans. A number of the inscriptions were chiselled out at Mr. Robert Neave's suggestion. There is a fine Sanscrit inscription there too, of which I have a copy and a translation.

The memorandum, forwarded by Captain Kittoe, is the following :—

Travellers are said "to see strange things," and justly so. The misfortune is few care to keep memoranda of them, and most dislike to repeat any thing that might seem marvellous or savouring of "a traveller's story." Nevertheless this silence is to be regretted, and I for one must break it and tell my story at the risk of repeating what may be already well known.

Lately when at Lahore, I observed in the outskirts of the city, in many places, horses' heads hung up by the nose on trees. On asking the reason of this, I was told that it is an olden custom, there, for suwars and others in whose care a friend may have left a horse, that if it died in his absence the head was cut off and thus suspended in order that, when he should return, it should be shewn to him in proof that it had not been stolen or otherwise made away with. The owner is taken to the spot and is told—"There, brother, is your horse's head; recognise it; it died; be satisfied."

K.

Read the following letter, dated 11th June, 1846, from Major Jenkins, with reference to Col. Low's wish to become possessed of authentic copies of Assamese characters (*Journal Asiatic Society*, vol. *Proceedings*).

With reference to your note of the 12th of May, enclosing a copy of a letter from Col. Low, requesting an alphabet of the Abom character, &c.—I have the pleasure to send you a note from Captain Brodie, who will, as quickly as possible, forward what the Colonel wishes for. I will ask Captain Brodie to send a few of the Boorunjees he alludes to, and which I have no doubt will be curious as showing the common dialect of about a million of Assamese; formed out of the corruption and mingling of Bengali, or whatever was the language of the old Kamroop kingdom, (the same I presume as what prevailed in Sylhet), and of the Shan language brought in by the Kooch Cacharees and Aboms. The Assamese is now confined to Assam, but it probably extended down to Dacca and over all the Eastern parts of Bengal, wherever the Kolitas and Koches can be traced. The latter, beyond Assam, are now all Rajbunses, but the former are probably lost under the name of Koist. But in all the Eastern zillahs, the greater part of all the Bengalis of this class are probably only recently converted Koches, as we know that we are losing our Kolitas daily.

The following, dated 4th June, 1846, is Captain Brodie's letter, enclosed:—

I shall have much pleasure in doing my best to procure the alphabet, vocabulary and numerals, which the Asiatic Society require for Colonel Low. I have a memo. of the numerals in the Roman character, and they appear to be identical with the Siamese.

1. { Ling, or	|	4. See.	|	7. Cheet.
{ Loong.		5. Hañs.		8. Pet.
2. Sung.		6. { Rook, or		9. Kau.
3. Sam.		{ Hook.		10. Cheep.

These correspond, many of them, exactly with the Siamese numerals found at page 55 of Low's Grammar.

The months are lunar and like the Chinese are counted by numbers ; thus—*Den-ching*, the first month ; *Den-kam*, the second ; *Den-sam* (3), the third ; *Den-see* (4), the fourth, and so on to the twelfth. The cycle of 60 years, called *Tew-singa* seems also of Chinese origin—the names of the years (*Laklee*) of it, being formed like the Chinese by a combination of a double series of terms ; one of ten, the other of twelve. * * Our Abom scholars are disappearing every day, and the rising generation will not in all likelihood give many new ones. The tables at the end of the Boorunjee we had printed here give the numerals, the names of the months, the names of the years of the cycle, tables for finding the corresponding English year and the Indian Sak, in the Assamese-Bengálí character. Should these be of any use, I shall be glad to send ten or a dozen copies of the Boorunjee to the Society.

Read the subjoined letter, dated 5th June, 1846, from G. T. Lushington, Esq. (Almorah), accompanying the valuable paper to which it alludes.

I send herewith a register of the thermometer and state of the weather at Nynee Tal, in this Province, from April, 1845, to April, 1846, inclusive, and request that you will lay the same before the Society for insertion in their journal (should it be deemed worthy) in the name of Major General Sir W. Richards, K. C. B., by whom it was drawn up, and to whose kindness I am indebted for the copy now sent.

You are doubtless aware that a new hill sanatorium is rapidly springing up at Nynee Tal, and that by many of the residents and visitors there it is supposed to be equal in point of climate, scenery, and capabilities to the other hill stations ; whilst at the same time it possesses an advantage not enjoyed by them, a deep and capacious lake, or rather lakelet, on which amateurs in rowing and sailing find ample amusement.

The distance from Nynee Tal to the foot of the hills is about eight miles, and to Moradabad (the nearest station) is fifty-nine.

The thanks of the Society were returned for the contribution.

Read a letter, dated 10th June, 1846, from J. Thornton, Esq., Secretary to the Government of the North West Provinces, announcing the transmission to the Society, for publication in its journal, of a summary of Major Cautley's project for irrigating the Doab from the Ganges, drawn up by Captain Baker of the Engineers, together with the plans which accompanied it.

Ordered that the special thanks of the Society be returned for the valuable paper communicated, which is referred for insertion in the journal.

The Kallinjur Cave-temple inscriptions and Ensign Maisey's drawings illustrative of the temples themselves, were then exhibited to the meeting; after which was read the following letter from the Hon'ble J. Thomason to the Secretary; dated 5th June, 1846.

I have now the pleasure to send you the *fac-simile* of the Callinger inscription, deciphered with the assistance of Kewul Ram (the College Pundit) and translated. The reading may be questioned in some places, but the inscription is of no value, save that being in the Kutila character, (Journal Asiatic Society, Vol. VI. p. 779 and Vol. VII. p. 276,) it was probably engraved about the tenth century, A. D. The mode of taking off the *fac-simile* is good, and I hope we may be better rewarded next year.

The first report, a provisional one, of the Sub-Committee of Finance was then read, as follows:—

First Report of the Finance Sub-Committee.

The Finance Sub-Committee, appointed at the Meetings of May and June, having met on two occasions, have now the honour to report, provisionally only, (as much of the information which they require is wanting, but mostly in preparation) as follows:—

It was reported to the Society at the last meeting that the Accounts and Vouchers had unfortunately been lost after the death of the late Mr. Robison.

These, they are happy to say, have been recovered, but so late that they were only replaced in the hands of the Sub-Committee at its first Meeting on the 22d of June.

The Sub-Committee elected the Rev. Dr. Hæberlin, *Chairman*, and Capt. Marshall, *Secretary*.

1. The Sub-Committee having examined the accounts for the years 1843, 1844 and 1845, report them correct.

2. *Resolved*, that the accountant of the Society be directed to prepare without delay for the Sub-Committee, an abstract of the Accounts of the Society's Funds for 1842, 1843, 1844, and 1845, in the same form as that for 1841, contained in the Journal, No. 122, at page 198.

3. The Sub-Committee find, that on the 31st Dec. 1841, there was a balance in favour of the Society of Co.'s Rs. 19,516-1-9, that on the 31st Dec. 1845 there was due from the Society to the Treasurer Co.'s

Rs. 134-12-9, liabilities Rs. 9,102, and that there was Company's Paper in hand, in amount Rs. 13,066-10-8.

4. They further find that the average annual income from every source, for the last four years up to the 31st Dec. 1845, has been about Co.'s Rs. 24,000, the average annual expenditure for the same period has been about Rs. 25,500. The items of the above annual income and expenditure are as follows: viz.

INCOME.

Government Allowances.

1. Oriental Publications.	6,000	0	0	
2. Curator of Museum.	3,000	0	0	
3. Preservation of Subjects.	600	0	0	
4. Economic Geology.	3,000	0	0	
5. Contingencies for do.	768	0	0	
6. Oriental Library.	936	0	0	
				14,304 0 0
Contributions from Members.	7,500	0	0	
Sale of Books, &c.	2,200	0	0	
				24,004 0 0
	Total Co.'s Rs.			24,004 0 0

EXPENDITURE.

1. Oriental Publications.	1,267	0	0	
2. Museum.	6,000	0	0	
3. Economic Geology.	3,600	0	0	
4. Library.	4,200	0	0	
5. Secretary's office.	3,000	0	0	
6. Journal, Printing and Sundries.	7,500	0	0	
				25,567 0 0
	Co.'s Rs.			25,567 0 0

5. It will be seen from the above details of our income and expenditure, that the Government entrust to us Rs. 14,304 per annum for specific purposes, and of course it is the duty of the Society to apply the various sums to the definite objects for which they were granted. But it appears that under the head of Oriental Publications, we received from Government Rs. 6,000 per annum, whilst our expenditure in that department only reached about Rs. 1267 per annum, whereas in the Department of the Museum we received from Government Rs.

3,600 per annum whilst our average expenditure was Rs. 6,000 per annum.

6. The Sub-Committee beg to bring to the especial notice of the Society, the following communication regarding Oriental publications from the Secretary to the Government of Bengal, dated 20th June, 1838, and which is recorded in our Journal of June, 1838, pages 556 and following, viz :—

TO JAMES PRINSEP, Esq. *Secretary Asiatic Society.*

SIR,—With reference to your letter to this department, dated 21st September, 1835, and to the reply dated the 30th of the same month, I am directed by the Honourable the Deputy Governor of Bengal to transmit, for the information of the Society, the accompanying copy of a letter, No. 8, of 1838, from the Honourable the Court of Directors, in the public department, dated the 28th March, and of its enclosures; and to state that the sum of 500 Co.'s Rs. per month, has from the 18th June, the date of the receipt of the despatch, been placed at the disposal of the Asiatic Society, for employment in the manner indicated by the Honourable Court. The amount will be made payable monthly from the General Treasury on the bills of the Secretary of the Society, countersigned by the President and duly audited, and at the close of each year, an account must be rendered, shewing the manner in which the amount has been expended.

I am, &c.

(Signed) H. T. PRINSEP,

Secy. to the Govt. of Bengal.

Fort William, the 20th June, 1838.

The Sub-Committee beg to recommend, in accordance with the specific terms contained in the above communication, that the Secretary of the Society be desired to draw up an account-current of the receipts and expenditure of the Oriental Publication Fund, from the commencement to the present time, as no such documents appear to have been regularly furnished. As far as the Committee can ascertain, it would appear that up to the beginning of the present year, the balance for the purpose of the fund, not expended, and which ought to be in our hands, amounts to not less than Rs. 25,000.

7. On a mature consideration of the financial position, the various operations and obligations of the Society, the Sub-Committee would beg strongly to recommend to the Society that the following scale of Expenditure for the various objects specified should be immediately adopted and strictly adhered to, viz :—

1. Oriental Publications.....	500	per	Mensem
2. Museum (Zoological).....	350	„	„
3. Economic Geology.	350	„	„
4. Secretary's office and Library.	350	„	„
5. Journals, Researches and Printing.	350	„	„
6. Contingencies.....	100	„	„

Total Rs. 2,000 „ „
or 24,000 per annum

(Signed) J. HÆBERLIN, *Chairman.*
R. W. G. FRITH.
JOHN MCQUEEN.
J. WARD.
G. T. MARSHALL, *Member and Sec.*

It was resolved that the report be received and adopted generally. With regard to the suggestion relative to assigning a definite sum to the expenses of each department, it was proposed by G. A. Bushby, Esq. seconded by B. Colvin, Esq. and unanimously resolved—

That the Sub-Committee be requested to receive from the heads of the various departments under the Society, a report of the manner of application, as respects the sums assigned to them, in their several sections, leaving the Sub-Committee to consider and report on them to the Society.

Read the subjoined proposal by Dr. Hæberlin on the propriety of publishing the *Smritis*, among the Society's Oriental collection.

Proposal to print the Smritis.

Next to the Vedas, *the ancient Smritis*, or Dharma Shâstras, deserve the attention of the learned. The treatises, now extant under that name, are generally ascribed to the sages, who throughout the Hindu Literature, in ancient and modern times, are not only represented as the progenitors of the Hindu race, but who from the beginning of the people appear to have directed the social and religious, as well as the political developments of the national mind.

Most of the writers of the *Smritis* are likewise mentioned as the authors of considerable portions of the Vedas; and both classes of their writings bear the clearest traces of antiquity on their foreheads. The very high antiquity of the *Smritis*, as a whole, considering that many of them must have been composed at least 3,000 years ago, would claim, on this very account, our best attention.

But when it is considered that on the foundation of these treatises is laid the entire, most complicated and most astonishing system of Hinduism, which has out-

lived the mutations of Society, and seems even till now to have grown stronger under oppressions from without ; when it is considered that down to this hour the maxims of law first adopted, or devised, by the ancient sages of the Hindus, still regulate, more or less, the civil jurisprudence of more than 100 millions of people ; it appears not only natural that we should wish to become fully acquainted with the ancient sources, whence such a mighty river has sprung, but it is surprising that so little is known as yet, respecting these writings.

Yájna Valkya, himself one of the number, counts twenty ancient lawgivers, whose treatises are still extant ; in the Padma Purána and later writings, 36 are mentioned ; but the entire number exceeds forty.

Now of all these works, as ancient most of them as the Vedas, and so important in various ways, *two* only have found their way into the hands of the literati. *Manu* and *Yájna Valkya*, (the latter, however, only in the *Mitákshará*, a comment on the original text) have been printed in the original Sanscrit ; all the rest are scattered about in manuscripts.

The object of this short notice is to draw the particular attention of the Asiatic Society to the ancient Smritis ; and to propose, if it shall meet the approbation of the Society, to print the entire body of the “ *Dharma Shástra*” or Smritis, with the exception of *Manu*, sufficiently well known, and two or three other treatises, which latter, indeed, bear the name of Smritis, but the external evidence of which clearly shows them to be of a much later date than the others, and to incorporate too many pauranic elements, for their claim to antiquity and originality to be admitted.

It is supposed that all the works it is meant to publish in the original, about 30 in number, could be compressed into two 8vo. volumes.

In the arrangement which I propose to follow, the order observed by Yájna Valkya, as far as it goes, would be adhered to.

I would only, further, mention, that having already translated nearly one half of the works I would propose to publish in Sanscrit ; I might hereafter, perhaps, be able, if it should appear desirable, to publish a literal version into English of all the treatises, with critical and historical notes, introductory to the several works, and elucidatory of their contents.

Calcutta, July 1st, 1846.

J. HÆBERLIN.

Ordered that the proposal be referred to the consideration of the Committee of Papers.

Owing to the lateness of the hour, the meeting broke up without receiving the reports of the Curators. The Geological Curator, however, handed over to the Secretary the following reports of a former month, which owing to some oversight remained hitherto unpublished.

Report of the Curator Museum Economic Geology and Mineralogical and Geological Department.

GEOLOGICAL AND MINERALOGICAL DEPARTMENT.

The specimens and shells announced by Lieutenant Sherwill from the fresh water deposit near Benares have reached us and are on the table.

ECONOMIC GEOLOGY.

Mr. J. Ellis, of the Commissariat Department, has presented us with a bag of the remarkable gem-sand of the Ava river. I learn from the jewellers that this is often brought to Calcutta and sold in large bags at very low rates, the greater part of stones being utterly valueless for them, though really gems. It appears to contain a numerous variety, some crystallised, but most fragments or rolled crystals of every thing, from spinelle rubies, with probably sapphires, corundums, cinnamon stones, beryls, agates, garnets, &c., down to smoky quartz; but it is a long labour to find a specimen worth putting aside, and perfectly useless to go through the labour of discriminating them till the whole is picked. It is in fact more curious as a mixture than separate specimens would generally be.

I present two reports, one on the Cerium ore sent by Captain Newbold, and the other on the ore of Antimonial Galena forwarded by Colonel Ouseley from Hisato, Chota Nagpore.

The following is an extract from a letter from Lieut. Blagrave, Scinde, to whom I had written again on the subject of the sulphur deposit of Kurrachee, reported upon to Government in September, 1843, but of which we had heard nothing:—

“ I sent off three boxes of fossils the other day to you, in one of which were specimens from the sulphur bed at Kurrachee, but which I fear will not turn out so good as expected. The report that was sent in by the Bombay Government gives a percentage of 30 or 40 per cent. I forget exactly the quantity stated, and by a trial made at Kurrachee with very indifferent means the result was little above 30 per cent. Will you kindly have the different specimens that I have sent analyzed, and let me know the exact quantity of sulphur yielded by each. I wrote, I think, on each, the different depths at which each was found. Among the specimens sent there are lumps of mould filled with a white flaky substance, I should like to know what it is. I have just seen the sulphur springs at Luckee, and collected a whole basket full of specimens, of which I will send you samples when I have more leisure. The springs are situated among, I think you would call them, limestone rocks, but *that* you will be able to judge of from the specimens of the rocks when they reach you. I shall try also to obtain a sketch of them for you, as the strata are curiously jumbled together; the bed of the streams from the springs are covered with bright green and red (I first thought deposits) but afterwards found that the green was a sort of lichen, and the red, small animalculæ. Some of the stones are covered with crystals of sulphur and some with melted yellow sulphur; the temperature of the highest spring is only 105° and the lowest 102°, at least that was what it stood at when I visited them. The stones near and in the water courses are covered with a

white yellow and bright orange crust, in feel like the white sugar on an old cake, a slight crust outside but not inside. I will send specimens of it, and if I have time a paper describing them more fully.

“ I forgot to mention that Meer Nusseer Khan had tried to turn the sulphur at Luckee to account, and expended a considerable sum of money in the attempt, but only got a few maunds of sulphur, the natives say, for the large sum of money expended; but that might have been owing to the faulty system adopted. You will be enabled to judge the true percentage when the specimens reach you.”

We have to acknowledge the receipt from Government of a copy of the Revenue Survey map of the Midnapore District and of a skeleton map of the Hajepore and Balagutch Dearuhs, Zillah Patna.

From Mr. J. Weaver, of Cossitollah, we have received a very beautiful specimen of iron spar (carbonate of iron), shewing the crystallisation and the rough spar, with its appearance as an ornamental material.

Examination of an ore of CERIUM from Southern India by Captain J. T. Newbold, Assistant Commissioner, Kurnool, Madras Territory. By H. Piddington, Curator Museum Economic Geology.

This ore was found by Captain Newbold in the central range of the Eastern Ghauts, between Curnum in Cuddapah and Gogarpilly in Kurnool, a little south of the Nundi Cunnama pass; he describes it—and I give his description first as being that of an accurate and experienced observer, and as conveying the impression it makes at first sight on the Mineralogist—as “ A light-reddish and fawn to peach coloured matrix, which has sometimes a glimmering lustre like that of *Lepidolite*; hardness about 6.0 *Mohs*, but often hard enough to strike fire with steel, where it appears to pass into chert, which also appears in the vein stuff. The fracture is evenly granular, inclining to splintery, streak faint pink or reddish white, opaque.”

This specimen, sent to the Society, I should thus describe as to external appearance. It is a massive matrix, mixed with bluish and greenish white chert, with nests and brief veins and specks of galena, so interspersed through it that it is impossible to procure any notable quantity free from some intermixture without perhaps destroying the specimen. Its colour varies from a light tile red, through light-orange and pink-red, to a whitish-red orange; the weathered surface would be, judging from the little we possess, dark-red brown, with perhaps reddish-white veins, but always dull.

The fracture is granular and somewhat splintery, glittering in some places, and is thus like a fine-grained red sandstone; here and there are nests of an orange brown colour with some appearance of crystallisation, like the fine varieties of carbonate of iron, which they may possibly be. I could not so much disfigure our single specimen as to pick out enough for examination.

The fracture is evenly granular and perhaps may incline to splintery, as Captain Newbold observes; but there is no fair opportunity of judging of fracture in chipping off minute bits for analysis.

The few fragments I obtained were angular.

The mineral is opaque, the streak a dirty white inclining to orange-grey. It does not soil. The hardness of the purest mineral I find to be 5—6 as compared with Apatite and Adularia.

It is rather tough and there is a slight adherence to the tongue. It feels meagre and cold; the specific gravity is very uncertain, and, in truth, no datum at all, for the mixture of galena and chert is so considerable that we have no piece which would give even an approximation to the correct determination of this character. It rings a little, I think, when struck with the hammer, and when breathed on gives a strong clayey smell. When pounded it is easily reduced to an impalpable powder of a yellowish-fawn or rosy-buff colour.

Blowpipe Examination.

A portion of the darker red crystallised part *in the forceps* changes to a bright chocolate brown, with a slight metallic or slaggy lustre in some parts, but does not fuse—

On charcoal it takes a greyish brown colour with a whitish dust about it in some places—

The powder fused with Soda on charcoal gives bright spots, and on Platina wire effervesces and spits sharply. In the reducing flame, a dull, dirty greenish white bead but nothing reduced from it—

With Borax on platinum wire in small quantities a clear glass; with more of the mineral, a light clear emerald green glass, both in the reducing and oxidating flame, which cools to almost a colourless one when quite cold—

With Microcosmic salt on platina wire infusible; when borax is added fuses to a light green yellowish-white bead, becoming quite opaque and much less coloured when cold.

Via Humida.

The mineral was found soluble with much effervescence in all the mineral acids, but acetic acid had no effect upon it.

The acid solutions, particularly that with sulphuric acid, gave abundantly with potass the characteristic gelatinous and semi-crystalline precipitate of cerium; and it was found by the usual tests that it contained moreover iron, sulphuret of lead, and lime, besides the usual accompaniment of silex and traces of alumina.

It was dissolved in sulphuric acid, which took up the iron and cerium only, and left the lead and lime as insoluble sulphates. No fluorine was detected by this or by the blow pipe. The solution was almost neutralised by ammonia, and the iron and cerium thrown down by benzoate of ammonia. It had been previously ascertained that the benzoate of cerium was highly soluble, and thus when the mingled benzoates were thrown on a filter they were easily separated by washing; the insoluble benzoate of iron remaining on the filter. The benzoate of cerium was found to crystallize in acicular plumose crystals, forming thin broad feather-like tufts and groups.

The oxide of cerium was also obtained independently by Laugier's process, as given in the last edition of Turner's Chemistry, so as to leave no doubt of its identity.

The mineral thus appears to be a triple carbonate of iron, lime and cerium, the mixture of galena being merely fortuitous and visible to the naked eye. I assume the combination of the three first to take place, as they are usually found in the common cerite, which our mineral probably is. It is certainly none of the fluates of this mineral.

I have not yet been able to ascertain if the combination is in definite proportions, but I think it not improbable that the orange brown nests alluded to are the crystallised mineral.

Report on the ore of Lead and Antimony sent by Lieutenant-Colonel Ouseley from Hisato, Chota Nagpore.

Lieutenant-Colonel Ouseley, at my particular request, has sent not only the ore in large lumps, but also specimens of the rock matrix, and other rocks and minerals found in the neighbourhood of this vein, and all these I have carefully examined, so that nothing of importance could, I think, escape us.

1. Judging from the masses we have, which are tolerably large, the vein appears to be composed of crystalline quartz in a few places, and in and near this the ore appears purest, but the greater part is an opaque, granular, and loosely aggregated quartz, mixed up with innumerable masses of crystals and grains of the antimonial galena, with minute masses and cubes of common sulphurets of copper and iron, and in some few places of white iron pyrites.* The siliceous matrix in many parts is deeply tinged with iron, and sometimes almost assumes the appearance of Bronzite from the ferruginous impregnation.

It was evident that such an ore and matrix *might* contain silver in quantities worth working, and also that if care were not taken to take good averages, and these from various parts and separate specimens, the silver might be overlooked. Thence has arisen the necessity for close and repeated examination of all the various parts of the ore to be well assured we were not overlooking what we were seeking for; since from the distance of the vein from all roads and rivers it is only as an argentiferous ore that it could have any value.

For the same reason all the other ores and earths near the matrix have been carefully examined. They are as follows:

- Black scaly mica, and micaceous earthy matter.
- Brown iron ore, and ferruginous earths of several kinds.
- Jaspers iron ore in bands.
- Red and Yellow Ochre.
- Greenish Clay.

* These last mostly occur in the neighbourhood of a few nests of rhomboidal limestone which are found in the quartz.

2. The pure ore is in the usual pseudo cubic and cubico-laminar masses and fragments. By the common goniometer the angles of the best fragments, perfectly bright and pure, which I could pick out, were 88° on 92° and the faces were evidently slightly curved.

The specific gravity of a good crystal, water-worn, but with all impurity carefully washed from it, was. 7.46

Of a bright mass from the lumps, which however might retain a little air. 7.51

Mean, 7.485

Thomson gives 7.53 to 7.65 for galena, but according to Vauquelin it may vary from 7.10 to 7.60, and thus specific gravity is evidently an uncertain character, especially where, as in this ore, antimony and silica and silicate of iron form considerable proportions.

3. Before the blowpipe it does not decrepitate and fly, but melts and disengages bubbles; gives a bright but dark-coloured steel-grey metallic bead with little bubbles on its surface; smokes when roasting, and the charcoal has the bluish grey deposit of the antimonial ores. By continuing the reduction it becomes a bright tin-white and highly malleable bead, giving then the dull yellow powder of oxide of lead on the charcoal as the bead diminishes. The closest and often repeated investigations could discover no trace of silver or arsenic. Iron, bismuth, lead, antimony, sulphur and silica were the only constituents of the purest ore; the bismuth also in very small quantities.

4. The results of several analyses made on various proportions of the purer and impure portions, and in large averages of 1000 grains, that nothing of value might be overlooked, gave always the same results as to constituents, and the absence of silver; with now and then a trace of copper from the copper pyrites already noticed as occurring in the matrix.

The picked and purest ore contains per cent.—

Water (Hygrometric),	2.50
Sulphuret of Lead (Galena), (giving Metallic Lead, 47.02)	54.50
Sulphuret of Antimony, (giving Metallic Antimony, 4.7)	17.00
Oxide of Iron,	4.00
Silicate of Iron,	21.50
Bismuth trace,	0.00
	99.50
Loss,	0.50
	100.00

There can be no question that this vein should be followed to see what changes of ores, if any, take place. It is almost positively mischievous to publish the exa-

minations of these mere surface specimens, for they may create an idea that a vein is worthless which is, on the contrary, a rich one at 50 or 100 feet deep. The best mines in many parts of the world are capped by poor ores, and sometimes of a different kind, and those almost worthless. The capping of copper by the common Blende or "Black Jack" is a familiar instance, and has even grown into a semi-proverbial saying in Cornwall, where the miners think it a favourable indication when sinking a shaft for copper, to find plenty of Blende (Sulphuret of Zinc) "for," they say, "*Black Jack rides a proud Horse.*"

For all presentations and communications the thanks of the Society were accorded.

Proceedings of the Asiatic Society of Bengal, SEPT., 1846.

The ordinary meeting for the month was held, as usual, at the Rooms on Wednesday, the 2d September, at half past 8 P. M.

Lieut. Col. Forbes, V. P., in the chair.

The minutes of proceedings of the July meeting were read, confirmed and ordered to be published.

E. A. Samuells, Esq. (C. S.) and Alexander Mitchell, Esq., proposed at the July meeting, were duly elected members.

The following gentlemen were proposed, for ballot at the next meeting :—

James Colville, Esq., Advocate General, proposed by the Honorable Sir Henry Seton, V. P., and seconded by the Secretary.

G. R. Wilby, Esq., proposed by Mr. Heatly and seconded by the Secretary.

W. Knighton, Esq. proposed by Mr. Piddington and seconded by the Secretary.

Dr. Young, proposed by Mr. Blyth and seconded by the Secretary.

James Dodd, Esq., proposed by Dr. W. B. O'Shaughnessy and seconded by Col. Forbes.

W. Grey, Esq. (C. S.) proposed by Mr. Welby Jackson and seconded by Col. Forbes.

A recommendation from the Committee of Papers was read, proposing that Mr. D. H. Williams, the Geological Surveyor to the Government of India, be elected a Corresponding Member of the Society.

The proposal being put, and duly seconded by Mr. J. Ward, was carried by acclamation.

Read the following list of additions to the Library during the last two months.

PRESENTED.

1.—Meteorological Register for the months of June and July, 1846.—By the Surveyor General's Office.

2.—Meteorological Register kept at Kyouk Phyoo, for June and July, 1846.—By the Superintendent of Marine.

3.—The Calcutta Christian Observer for July and August, 1846 —By the Editors.

4.—The Oriental Christian Spectator for August, 1846.—By the Editor.

5.—The Quarterly Journal of the Geological Society, vol. I. for 1845, and Nos. 5 and 6 for February and May, 1846.—By the Society.

6.—Travels of Evleya, part II.—By Oriental Translation Fund.

7.—Haji Khalfac, Lexicon, Arab. et Lat.—By the Oriental Translation Fund.

- 8.—Memoirs of the Royal Astronomical Society, Vol. XV.—By the Society.
- 9.—Notices of Persian Poets, by the late Right Hon'ble Sir Gore Ouseley, Bart., by the Rev. J. Reynolds.—By the Oriental Translation Fund.
- 11.—The Journal of the Royal Asiatic Society of Great Britain and Ireland, No. XVI. part 2.—By the Society.
- 12.—The Report of the British Association for the advancement of the Sciences, for 1845.—By the Association.
- 13.—Natural History of New York, part I. Zoology, by James E. DeKay, 5 vols.—By the State of New York.
- 14.—Natural History of New York, parts III. and IV. Geology, by W. W. Mather, Lardner, Vanuxem, Lewis C. Beck, James Hall and E. Emmons, 5 vols. and 1 map.—By the State of New York.
- 15.—Jahrbücher der Literatur, January to December, 1845, Nos. 109, 110, 111 and 112.—By Baron Von Hammer Purgstall.
- 16.—Monographie des Poissons Fossils du Système Devonien (old red sand stone) par L. Agassiz, 1845.—By the Author.
- 17.—Ditto ditto, Du vieux Gres Rouge, par L. Agassiz, 3me Livraison 1845.—By the Author,
- 18.—Bulletin de la Société de Géographie, Troisième Série, Tome IV.—By the Society.
- 19.—Antiquarisk Tidsskrift, Bulletin de la Societe Royale des Antiquaires du Nord, 1843 and 1844, 2 vols.—By the Society.
- 20.—Moore's Indian Appeal Cases, 6 Nos.—By the Government.
- 21.—Extract from a Report on the District of Babriawar, by Capt. G. Le Grand Jacob.—By Government.
- 22.—Report upon the General Condition of the Province of Katteewar, by Capt. Jacob.—By the Government.
- 23.—Transactions of the Medico-Chirurgical Society for the year 1845-6. vol. I.
- 24.—Journal of the Ceylon Branch of the Royal Asiatic Society, vol. I. part I. 5 copies.—By the Secretary to the Society.
- 25.—Commercial Annual for the years 1844, 45 and 46, by E. Wilkinson, Esq. 1 copy.—By the Author.
- 26.—The History of the Kings of Assam, 8 Pamphlets.
- 27.—A Map of Pooree, or the Southern Division of Cuttack.—By the Government.

PURCHASED.

- Journal des Savans, January to May, 1846.
- The North British Review, No. IX. May, 1846.—5 Nos.
- Annals and Magazine of Natural History, including Zoology, Botany and Geology, vol. XVII. No. 114. June, 1846.
- Illustrations of Indian Ornithology, by S. C. Jerdon, Esq. April, 1846, 2 copies.
- Fauna Antiqua Sivalensis, being the Fossil Zoology of the Sewalik Hills in the North of India, by Hugh Falconer, M. D., F. R. S. F. L. S. F. G. S. and Proby

T. Cautley, F. G. S., Letter Press, part I. 3 Nos. and Illustrations, part I. 9 Nos.
The Birds of Australia, by J. Gould, F. R. S. part XXII.

EXCHANGED.

Journal Asiatique, quatrième série, Tome VII. Nos. 32 and 33, March and April, 1846.—2 copies.

Calcutta Journal of Natural History, No. 21, April, 1845, and No. 26, April, 1846.

The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, third Series, Nos. 188 and 189, May and June, and No. 190, Supplement vol. XXVIII.

The Athenæum, Nos. 967 and 968, May 9th and 16th.

The Second Report of the Sub-Committee of Finance, being presented to the chairman, was then read.

Second Report of the Sub-Committee of Finance of the Asiatic Society of Bengal, 3d July, 1846.

The Finance Sub-Committee appointed at the Meeting of March 4th, and June 3d, have now the honor to report as follows:—

1. The Sub-Committee find, that some members of the Society have failed for longer or shorter periods to pay their subscriptions, they therefore recommend that these members be reminded of their obligations.

2. The Sub-Committee called upon the Heads of Departments, according to a Resolution of the last meeting of the Society, to state in detail the manner in which they proposed to arrange their establishments with reference to the limited expenditure fixed by the meeting, at the suggestion of the Sub-Committee. The Secretary of the Society (Mr. H. Torrens) stated, that his successor must arrange the establishment of the Library and the Secretary's Office, as he (Mr. Torrens) had resigned. The Curator of the Museum of Economic Geology (Mr. Piddington) gave in a detailed statement of his department, amounting to the sum prescribed, which was received as satisfactory. The Curator of the Museum (Mr. Blyth) stated that the business of the Zoological Department, including his own salary, could not be carried on upon the sum fixed. The Sub-Committee have received a letter from Mr. Blyth respecting his claims on the Society and on the subject of his department generally, which document they beg to submit for the consideration of the Society.

3. In the third paragraph of their First Report, the Sub-Committee stated, according to the information then before them, that the liabilities of the Society amounted to Co.'s Rs 9,102, the chief item of which was Rs. 7,000 for printing the Society's Journal up to No. 162 at the Bishop's College Press. They now find in consequence of enquiries they considered it necessary to institute, that this item should have been only Co.'s Rs. 4,019 11 0. This discrepancy appears to have originated in the circumstance of the accounts of the Journal of the Society for the three years ending 31st December, 1845, exhibiting the former item instead of the latter, evidently arising from the charges for the Journal before it became the Society's property, being accidentally mixed up with those incurred since it became so. In the course of these enquiries they also found, that the total receipts for subscription to the Journal since it became the Society's property up to the 1st July, 1846, amount to Rs. 5,355 8 0, giving about 2,000 per annum additional income on account of the Journal. They have therefore much pleasure in announcing to the Society, that they can recommend 1,500 Rs. per annum or 125 Rs. per mensem to be allotted to the department of Journals, Researches, and printing, and Rs 500 per annum or about Rs. 42 per mensem to the Zoological Museum, in addition to the sums agreed upon at the last meeting of the Society, as contained in the 7th paragraph of their First Report.

The revised scale of expenditure, if approved by the Society, will now stand as follows :—

	per mensem.	per annum.
1. Oriental Publications..	Rs. 500 0 0	61000 0 0
2. Museum (Zoological)..	392 0 0	4,700 0 0
3. Museum of Economic Geology, Mineralogical and Geological Departments..	350 0 0	4,200 0 0
4. Secretary's Office and Library.	350 0 0	4,200 0 0
5. Journals, Researches and Printing..	475 0 0	5,700 0 0
6. Contingencies..	100 0 0	1,200 0 0

Total Co.'s Rs. 2,167 0 0 26,000 0 0

(Signed) J. HEBERLIN,
R. W. FRITH,
J. McQUEEN,
J. WARD,
G. T. MARSHALL,

(True copy.)

H. TORRENS, *V. P. and Secretary.*

Asiatic Society's Museum, July 17th, 1846.

MY DEAR SIRS,

I beg to acknowledge the receipt of your note of yesterday's date, requesting information for the Society's Sub-Committee of Finance as to whether the expenses of the Zoological Department of the Museum can be brought within 350 Rs. per mensem.

With every disposition to carry out the wishes of the Sub-Committee, I cannot but remark in reply, that I consider such an arrangement to be impracticable; only that my own very moderate salary of itself more than covers that amount.

It will be remembered that from May 1st, 1844, an increase of 100 Rs. per month was granted me, to be paid with arrears when the letter-press to accompany the publication of Burnes's drawings should be ready for printing; and I leave you to judge, therefore from the fact of the present accumulation of those arrears, how exceedingly I require *further assistance* in the Museum, to be enabled to discharge efficiently all the duties of my office.

That office requiring the whole undivided energies of the person holding it, is therefore *incompatible with any other appointment*: hence what salary I receive I must derive from this one source only; and with no sort of promotion in view, it must be acknowledged to be but a poor remuneration for the laborious occupation of the entire time of an educated European in this climate. Nought but devotion to Science could continue to reconcile me to it, whatever may be its non-pecuniary contingent advantages.

I would next remind the Sub-Committee, with all respect, that on my being deprived of the great advantage of personal residence at the Museum, it was thought but just to grant me compensation for the increased personal expenditure which the new arrangement entailed upon me: but the amount of that recompense is still under consideration, with six months of it due at the present time.

Passing now to the consideration of the subordinates employed in my department, I can only repeat the statement, which I have before had occasion to make, by again urging that the present establishment is not merely at its extreme minimum, compatible with efficiency, but *considerably below that standard*. Our establishment is not nearly adequate to the amount of work required of it, and the consequence is that arrears are at this time accumulating. With an extensive collection of valuable skeletons in store, scarcely one has been mounted upon wire for the last three years; other sub-departments under my superintendence become unduly neglected; my time is continually taken up with drudgery; which might and ought to be performed by additional assistants,—to say nothing of the incessant application which it involves on my part; and what is personally most of all annoying I feel how much more I could accomplish for the Society with the necessary humble aid, which the bestowal of an additional 50 Rs. monthly would place at my disposal.

Under these circumstances, I can suggest no alteration between at least continuing the existent establishment in the Zoological department of the Society's Museum

and that of suppressing it altogether in its present most flourishing condition: as it is, the indifference of our countrymen generally to Scientific Natural History is matter of deserved reproach with all civilized foreigners to this day. Oxford nor Cambridge can boast of a chair for Zoology among its Professorships; and during the brief period that the French held sway in Egypt, more was done towards the investigation of the natural productions of that country, far more than has been even yet accomplished for India. I had hoped to effect something that should at least contribute to remove this stigma from our nation, and have thought myself entitled to look to the Society to second my exertions to carry out the objects of my curatorship, at any rate to afford due scope for the exercise of such abilities as I may possess, and grant me the chance of earning all possible reputation that should compensate in some degree for the insignificance of my pecuniary allowances.

It is to be remarked that the contingent expenses of the Zoological department of the Museum, have certainly not increased in the ratio of its development; but on the contrary have decreased for the last two years and more, from the considerable diminution of the number of purchases of specimens. What few indeed are now brought, in the bazar or of Shikarees, are almost wholly with a view to supply other Museums with specimens, in return for the contributions we receive of desiderata for our own; and it will be admitted that money can scarcely be better spent than in such intercourse. It is chiefly by the present system of active correspondence with working naturalists that our collections have been advanced to their present highly prosperous condition; and it is only by adhering to that system that a continuance of the same success can be assured to us.

By dint of no small labour and perseverance a very extensive system of correspondence both within and out of India has been gradually established, to the results of which our collections bear almost daily testimony, but we only begin to reap the advantages of that intercourse, and a more inauspicious time for checking the furtherance of its objects by the withdrawal of the funds necessary for that among other purposes can scarcely be than just at present.

In conclusion I must repeat that the establishment is already at its minimum compatible with ability, and that in my humble opinion no retrenchment can be made in its expenses without much more than commensurate detriment to the Society's Museum, and obstruction to the objects for which in part the Society was originally constituted.

Believe me, my dear Sirs, ever truly your's,

(Signed) E. BLYTH,

Curator Zoological Museum,

(True Copy.)

H. TORRENS,

V. P. and Secretary.

CAPT. MARSHALL, *Secretary Sub-Committee Finance Asiatic Society,*

SIR,—In reply to your letter I beg to say that understanding the Society to appropriate as follows, 36 Rs. from its own funds, i. e. Government allowance for the Museum of Economic Geology Curator.....	250	0	0
Contingencies,.....	64	0	0
	<hr/>		
	314	0	0
From Society for Geological and Mineralogical Departments.....	36	0	0
	<hr/>		
Total Co.'s Rs.	350	0	0

I can only as before, continue with the same establishment as sanctioned by Government, viz :—

Sircar and Writer, who is also assistant (as far as he can be so) in making Catalogues, marking and arranging specimens, &c. &c.....	16	0	0
Carpenter, who also polishes and cuts stones.	8	0	0
Punka Boy.....	2	0	0
Peon for letters, &c. &c.....	5	0	0
	<hr/>		
Co.'s Rs.	31	0	0

It will be noted that these persons are all employed for the 3 Departments, though paid for by the Economic Geology, which is scarcely fair to Government, but which can not be avoided. I make the bearer and Punka boy and Carpenter, and at times the Sircar, assist also in the Laboratory !

From the Government Allowance of..	64	0	0
Take this.....	31	0	0
Leaves for Books, Chemical, and agents and all other contingencies for Museum Economic Geology only.....	33	0	0
Add Society's Allowance.....	36	0	0
	<hr/>		
Co.'s Rs.	69	0	0

I have a bearer who keeps every thing clean below and attends to the windows, doors, &c. as well as assisting those upstairs. He is now become very intelligent and handy in the laboratory also. He has hitherto been paid by the Society, but I suppose it must be necessary to pay him from my department, on which the Committee will decide.

The sum of 69 Rs. I need not remark is really not much more than the expenses of the laboratory very carefully managed would amount to in this country, where every thing is so absurdly expensive which relates to Chemical pursuits; and there are books, specimens, postages, freights and a host of smaller charges besides, as will be seen by the accompanying books which I send for the inspection of the Committee, being the petty account books of the Departments for 1845-46, but

which do not include books and some bills paid by the Secretary's department direct which will bring the whole to the amount allowed by Government.

I am, Sir, Your obedient servant,
 (Signed) H. PIDDINGTON,
Curator Museum Economic Geology.
 (True Copy.)
 H. TORRENS,
V. P. and Secretary.

Calcutta, 17th July, 1846.

After considerable discussion, it was proposed by Mr. J. Ward, seconded by Mr. E. B. Ryan and carried—

That the Reports of the Finance Committee be laid on the table for the perusal of the Society for the period of a month.

A recommendation from the Committee of Papers was read, to the effect, that the acquiescence of Dr. W. B. O'Shaughnessy having been obtained to the arrangement of associating him in the Secretariat of the Society, as the colleague of Mr. Torrens, if that arrangement were acceptable to the General Meeting, the Meeting do approve of it.

In accordance, it was proposed by the President, seconded by Mr. B. J. Colvin, and resolved, that the Society does approve of, and confirms the arrangement.

In consequence of the private business of the Society having engrossed nearly the entire time of the meetings for several months, a heavy accumulation of scientific arrears had resulted. It was therefore moved by Mr. Heatly, seconded by Mr. Laidlay, and carried unanimously,

That there be a supplementary meeting during this month, exclusively to dispose of arrears of scientific business: to be held on the 17th instant.

*Proceedings of the Supplementary Meeting of the Asiatic Society of
Bengal, SEPTEMBER, 1846.*

Pursuant to a resolution passed at the monthly meeting of the Society, a Supplementary meeting for the disposal of the arrears of Scientific business, was held at the Society's Rooms, on Thursday evening, at half-past 8, P. M.

Lieut.-Colonel Forbes, Vice-President, in the Chair.

The minutes of Proceedings of the last meeting were read and reserved for confirmation at the next regular monthly meeting.

Read the following Report for September, 1846, by the Curator Museum Economic Geology.

REPORT OF THE CURATOR OF MUSEUM OF THE ECONOMIC
GEOLOGY FOR SEPTEMBER.

Geology and Mineralogy.—I have obtained from the bazar some fragments of Encrinital or Pentacrinital fossils, which are sold there as medicines, and called the "branches of the Huzoor ul Loheid," which I have described and named provisionally "Loheidolite" in my report of October, 1844.

They are said to be from Loheida, also, so that it is possible this is a locality rich in fossils of the period to which these belong, though little dependance can be placed upon what is said of locality, as they may be brought to Loheida from a considerable distance.

Dr. Spilsbury has sent from Bundlecund a specimen of Copper-ore,* and one of a highly curious sandstone, of which last he says:—

"The other is a specimen of the sandstone used in building at Lul-lutpoor, (the Lurthpoor of Arrowsmith's map,) a station of Scindia's Contingent, some 20 miles east of Chunderee; it is remarkable for the ferruginous spherules imbedded in the stone, a good example of which is sent, as also the half of another to test its nature: the rock is quarried about 20 miles from the station."

* Will be noticed in the Economic Geological Report.

I have not sacrificed this very valuable little fragment to testing, which would only shew us probably that it is a highly ferruginous sandstone, and have only satisfied myself that it is not magnetic ; for it is of much higher interest than in a mere lithological point of view, inasmuch as, when examined by the magnifier or even by the naked eye, it shews exactly the structure of the Volcanic Bombs as described by Darwin and other writers, being highly compact at the external surface, where the iron also is in the state of a deutoxide, and of a loose concretionary texture at the centre, where (and also at the surface from the effects of exposure to the atmosphere), it is in the state of peroxide.

When we look at the specimen in the sandstone it is difficult not to suppose that it must have been imbedded there when the sandstone was soft ! and we thus arrive at the conclusion that our little ferruginous bullets *may* have been *volcanic grape shot*, since their size does not entitle them to be called bombs. I have written to Dr. Spilsbury for more of these very curious specimens, when we shall be able to say more of them.

I have to announce also a further addition to our collection of Aero-lites, being a second specimen obtained from the refuse of the Coal and Iron Committee's Collections, probably from Assam.

I at first thought that this was only another fragment of the former one announced in my report of June last, and indeed it very greatly resembles it in physical qualities, but upon chemical examination it has proved to be an entirely different specimen, and a remarkable one, as containing a considerable per-centage of Cobalt, of which the first is entirely destitute, and very little if any Nickel, of which it will be remembered the first has a notable proportion.

Museum of Economic Geology.—Dr. Spilsbury has also forwarded to us a specimen of Copper-ore from the Sahgurh territory, about 60 miles north of Saugor in Bundelcund, sent in by the Chief to the Deputy Commissioner, Captain Hamilton, and said to have been worked in former times, but it is so very poor an ore that it should rather be called a Gossan.* I was in hopes that the greenish black crust at the surface might contain Uranium, but it does not, being merely iron with a very little copper.

* The Cornish Miner's name for a ferruginous concretion more or less impregnated with copper, which indicates at the surface the existence of veins below.

Meteorological Note.—At the last meeting our Secretary handed to me a letter addressed to him by Dr. McGowan, inclosing one from Dr. Bellott of H. M. Ship *Wolf*, giving an account of a shower of ashes or dust at Shanghae, which enclosed a minute specimen of it. On examination it proved to be so highly curious that I have made it the subject of a report which may perhaps be worth insertion in the Journal, as illustrating meteorological questions of much importance.*

H. PIDDINGTON.

Mr. Blyth, the Curator of the Museum of Zoology, exhibited the rare and valuable specimens of Birds, &c. received from Australia.

The following propositions were adopted by the Society:—

Proposed by G. A. Bushby, Esq., seconded by C. Huffnagle, Esq., and carried,

That the thanks of the Asiatic Society be offered to the several Societies, and individuals, from whom specimens have been presented this evening, through Mr. Blyth.

Proposed by G. A. Bushby, Esq., seconded by R. W. G. Frith, Esq. and resolved, that special thanks should be communicated through the Government of Bengal for the valuable gift from the State of New York to the Society's Library of the great work on the Natural History of New York, received at the last meeting.

Proposed by Mr. Heatly, seconded by Mr. Ward, and resolved, that in returning thanks for contributions to the Museum, Library, &c., the established copper-plate form be adhered to.

* This paper will appear in the Journal.

Proceedings of the Asiatic Society of Bengal, OCTOBER, 1846.

At a meeting of the Asiatic Society held on the 7th October, 1846, Lt.-Col. Forbes, Vice-President, in the chair,

The Proceedings of the meeting of the 2nd September and of the supplementary meeting of the 17th September, were read and confirmed.

The following gentlemen having been duly balloted for were unanimously elected members of the Society :—

G. R. WILBY, Esq.

W. KNIGHTON, Esq., Professor, Hindu College.

JAMES COLVILL, Esq., Advocate General.

JAMES DODD, Esq., Assay Master.

DR. YOUNG.

W. GREY, Esq., C. S.

C. J. Montague, Esq. of Serampore, was proposed for election as a member at the next meeting, by the Rev. J. Long and seconded by A. Mitchell, Esq.

The annexed list of works received since previous meeting was laid on the Table.

List of Books prepared for the Meeting of Wednesday, 7th October, 1846.

PRESENTED.

The Calcutta Christian Observer, for September and October, 1846.—By the Editors.

The Oriental Christian Spectator for September, 1846.—By the Editors.

The Journal of the Royal Geographical Society of London, Vol. XVI. Part I.—By the Society.

Self-Monition, an Armenian Poem, by Mr. George A. Zechariah of Java, through Mr. Avdall.—By the author.

* (Radices Linguae Sanscritæ, N. L. Westergaard, 1841—12 copies.

Kalidasa's Ring—Çakuntala herausgegeben von Dr. Otto Boehtlingk, 1842—12 copies.

* German Books within the parentheses have been forwarded by the Society's agents in London without any advice but more likely for sale than presentation to this Society.

Zeitschrift für die Kunde des Morgenlandes. Von Christian Lassen—1841, 42, 43, 44 and 1845.—14 copies.

Indische Alterthumskunde. Von Christian Lassen, 1843—6 copies.

Scriptorum Arabum De Rebus Indicis, Edidit Joannes Gildemeister—12 copies.

Malavika et Agnimitra, Edidit Dr. Otto Fred Tullbergh, 1840—3 copies P. P.

Radices Prâcriticæ, Edidit et illustravit Dr. Nicolaus Delius, 1839—12 copies P. P.

Kalidasæ Meghaduta et Cringaratilaka, J. Gildemeister, 1840—12 copies P. P.

Die Falsche Sanscrit Philologie des Herrn Dr. Haefer in Berlin, Von J. Gildemeister, 1840—12 pamphlets.)

EXCHANGED.

Edinburgh New Philosophical Journal, by Professor Jameson. April to July, 1846.

The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, No. 191, July, 1846.

The Athenæum, July 4th, 11th, 18th, 25th, and August 1st, 8th and 15th.

PURCHASED.

The Annals and Magazine of Natural History, No. 115, Vol. XVII. July, 1846. Supplementary number, and number 116.

Lardner's Cabinet Cyclopædia. History of Ireland—Vol. IV.

Histoire Naturelle des Poissons—Vol. XVIII.

Ditto .. Planches—Vol. XVIII.

Read a letter, No 2305, from Cecil Beadon, Esq. under-Secretary to the Government of Bengal, to the Vice-President and Secretary to the Asiatic Society :—

SIR,—The Hon'ble the Court of Directors having intimated their approval of the transfer to the Asiatic Society of the Books referred to in Mr. Secretary Prinsep's letter to the address of the Secretary to the Society, No. 265, dated the 24th February, 1836, I am directed to state that the monthly sum of 78 Rupees, allowed by Government for the custody of the Books in question is to cease from the end to the current month, agreeably to the conditions contained in Mr. Prinsep's letter.

I have the honor to be, &c.

C. BEADON.

Under-Secy. to the Govt. of Bengal.

Proposed by Dr. Hæberlin, seconded by Mr. Huffnagle and resolved, That this letter be referred to the Committee of Papers for report.

Read the following letter from Mr. H. T. Prinsep, enclosing copy of a letter forwarded by the Russian minister in acknowledgment of receipts of the principal publications of the Asiatic Society.

To H. TORRENS, *Esq. Secy. As. Soc.*

37, HYDE PARK GARDENS, 24th July, 1846.

MY DEAR TORRENS,—I have just received from Baron Brunow, the Russian minister, the original, of which a copy is subjoined. His Excellency requests me to make the substance known to the Asiatic Society of Bengal, and to return the original, which compels me to make the copy.

Believe me,

Your's very sincerely,

H. T. PRINSEP.

MONSIEUR LE BARON,

Je viens de recevoir par l'entremise de la maison Allen & Co. à Londres, sur le bateau à vapeur Magnet, l'envoi contenant le second exemplaire des principales publications de la Société Asiatique de Bengale, qu'elle avait mises dans le temps à la disposition de Sa Majesté Impériale.

Ayant l'honneur de vous en instruire, je me fais un devoir de vous remercier des soins que vous avez prêtés à cette affaire. Veuillez bien, Monsieur le Baron, renouveler aussi l'expression de ma reconnaissance à la Société Asiatique de cette offre si intéressante et si utile à nos établissemens scientifiques.

Agrérez en même temps, Monsieur le Baron, l'assurance de ma considération très distinguée.

(Signé) OUVAROFF.

(True Copy)

(Signed) H. T. PRINSEP.

St. Petersbourg, ce 1 (13) Juin, 1846.

A son Excellence Monsieur le Baron de Brunow, &c. &c.

Read letters from the Secretary to the Marine Superintendent forwarding Registers of Meteorology of Tides, of Anemometer and Pluviometer, kept at Kyouk Phyoo, and notifying landing of two cases of books from the ship Elizabeth.

Read extracts from a letter from Monsieur Jules Mohl, dated Paris, 22nd July, 1846, and notifying that the sum of 2245 francs 65 cents remained at credit of the Society in his hands from sales of oriental publications.

Société Asiatique. Secretariat, Rue Taranne, No. 12, Paris, le 22 Juillet, 1846.

DEAR SIR,—I have sent you on the 16th of March last year, the detailed account of the receipts and expenses for the sale of your Society's books here, but having received no answer, I suppose that my letter has not reached you. The result of the account was that I had in hand for your Society 1997 francs 65 cents. This sum has increased by last year's sale and amounts now to 2245 francs 65 cents, all expenses deducted, and I am waiting for your order to whom it shall be paid in London on your account.

If any of the Paris Society's books should have been sold in Calcutta, I beg you will let me know the amount that I may deduct it from the above sum due to you.

I have remarked that in the advertisements which you are so kind as to put in the Journal of your Society, the Aboulfeda is marked 8 rupees, but it ought to be 15 rupees.

I have asked you formerly to send parcels or boxes of books by French ships, but I find so much irregularity in the manner of delivering them, that I think the best will be in future to send all to London. It will cost us something in duty and commission, but at least we shall get the parcels sooner and by far more surely.

In consequence of the new arrangements which we have been obliged to make on the death of M. Cassin, our former agent, I find some difficulty in superintending the sale of the books of your Society. I think it would be to the advantage of the sale, if you would allow me to commission M. Duprat with it. M. Duprat is our Society's bookseller, since madam PONDY Dupin has retired from her business, and is a most honest man. I could audit his account every year, just as I did M. Cassin's. He would be obliged to increase the prices a little, but not much, and I am convinced your Society would gain by the change. Of course if your Society should wish that the actual arrangement should continue, we will go on as before, but my own opinion is that M. Duprat will sell more of your books than we do.

Could you buy for me two copies of *M. Elliot's supplement to the Glossary*, Agra, 1845? It is a most excellent book and I and M. Burnouf are very anxious to get it. I should be very happy too, if you could buy for me a copy of the Calcutta Agricultural Society's papers. I have often written to England to get them, but have never been able to buy them; there is most likely many a book published in India which we should be happy to get, but we learn their expense only by accident.

I am, Dear Sir,

Your's very truly,

JULES MOHL.

Resolved that this letter be referred to the Secretaries for special report, and that information be solicited from those officers as to the state of the Society's accounts with the several agencies entrusted with the sale of the Society's publications.

Proposed by G. A. Bushby, Esq., seconded by Dr. Hæberlin, and resolved,

That the Secretaries be requested to report on the stock of books belonging to other Societies or individuals intrusted to this Society for sale, also as to the state of preservation of the books.

Read a letter from Cecil Beadon, Esq., under-Secretary to the Government of Bengal, forwarding a map of Pooree, in 9 parts, for the museum of Economic Geology.

Read a letter from P. Melvill, Esq., under-Secretary to the Government of India, forwarding a Report by Captain Jacob, 2d Grenadier Regiment, Bombay N. I., on the Province of Kotewar, and extract from Report on the district Babriawar.

Read the following letter from the Librarian of the Calcutta Public Library :—

TO H. TORRENS, ESQ., *Vice-President and Secretary, Asiatic Society.*

SIR,—The Curators of the Calcutta Public Library being desirous of increasing their Collection of Oriental works, direct me to say that they will feel much indebted for one copy of each of the following books. They trust the society will comply with this request, calculated as it is to promote the cause of Oriental literature.

Index to Mahabharata.

Khazánat ul ilm ul Riazi.

Anis ul Musharrahin.

Sharaya-ool Islam.

Burnouf's mémoire sur deux inscriptions cunéiformes.

Ditto, Commentaire sur le Yacna, with notes.

Elémens de la Grammaire Japonaise—Par Rodriguez et Remuset.

Do. Supplement.

Contes Arabes, traduits par J. J. Morcel.

Brosset, Elemens de la Langue Georgienne.

Klaproth Vocabulaire et Grammaire de la langue Georgienne.

Géographie d'Aboulfeda, Texte Arabe.

Points in the History of the Greek and Indo-Scythian Kings, &c. translated by Dr. Roer, and edited by H. Torrens, Esq.

I have the honor to be, Sir,

Your most obdt. Servant,

PEARY CHAND MITRA,

Librarian, Calcutta Public Library.

Metcalfe Hall, the 4th August, 1846.

Referred to the Secretaries for special report whether books be procurable, it being suggested by Mr. Piddington that the curators of the Public Library might on this occasion be requested to allow the officers of the Asiatic Society the free use of books from their Library for scientific or literary reference.

The Reports of the Finance Committee having been read and discussed; on the suggestion of Dr. W. B. O'Shaughnessy, C. Sec. it was proposed by Dr. Hæberlin, seconded by Mr. Ward, and resolved unanimously,

1. That the debts of the Society be paid at the earliest possible date by the sale of Company's Paper or other available means.
2. That the Funds assigned by Government to particular purposes, be in future strictly applied to those purposes alone.
3. That the items of distribution of general expenditure detailed in the Finance Committee's reports be referred to the Committee of Papers in association with the Finance Committee, for suggestions and further information.

It was arranged that a meeting of the Committees should take place at an early date for conference on the subject of the last resolution.

For all presentations the thanks of the Society were ordered to be returned.

*Proceedings of a Meeting of the Asiatic Society of Bengal, held on
the 4th NOVEMBER, 1846.*

J. W. Laidlay, Esq. in the Chair.

The Proceedings of the October meeting were read and confirmed.

C. J. Montague, Esq., of Serampore, having been balloted for, was duly elected a member.

Dr. Hough, Physician General, Bengal Medical Service, was named for ballot at next meeting. Proposed by Mr. Blyth, seconded by Dr. O'Shaughnessy.

Lieut. Latter, Bengal N. I., proposed by Capt. Marshall, seconded by Rev. Mr. Long.

Read the following announcement by the Committee of Papers of the resignation of Mr. Torrens, late Secretary to the Society :—

October 30, 1846.

SIR,—I have the honour to state that being under orders for employment out of Calcutta, it will soon cease to be in my power to continue in the duties of Honorary Secretary to the Asiatic Society of Bengal.

I have to request that you will tender my resignation of this honourable post to the Vice-President and Members here resident of the Society, and oblige me by notifying it to the Societies with whom we have been in correspondence.

I am, &c,

H. TORRENS,

V. P. Asiatic Society of Bengal.

With reference to Mr. Torrens' letter, the Committee of Papers proposed the following resolutions for adoption by the Society :—

Resolved, that the Asiatic Society of Bengal on the occasion of their being deprived of Mr. Torrens' services as their Honorary Secretary, do hereby record their grateful sense of the distinguished zeal and ability with which, for several years he has conducted the duties of the office. As a testimonial of their respect, they further resolve to elect Mr. Torrens an Honorary Vice-President of the Society, and they solicit that in this

capacity, he will continue to afford them his highly valuable co-operation in the prosecution of the numerous objects of literary and antiquarian research which he has already pursued with such eminent success.

Resolved, that J. W. Laidlay, Esq., be elected a Co-Secretary of this Society.

Resolved, that the management of the Correspondence—general business of the Society—and immediate control of the office establishment be assigned to the Senior Secretary, in order to obviate the confusion which is apt to arise when the duties of one office devolve on two individuals.

Mr. Torrens was accordingly elected an Honorary Vice-President of the Society, and the 1st and 2d resolutions proposed by the Committee of Papers were unanimously carried; the 3d, relative to the arrangements for the secretariat duties being left to these officers to settle as they may think fit.

The following Report was submitted of the conference between the Committees of Papers and Finance, held on the 29th October, in accordance with the resolution of the Society passed at the October regular meeting.

Asiatic Society, 29th October, 1846.

Pursuant to the resolution of the last meeting, the Committees of Papers and Finance met at the Society's rooms at 8½ P. M.

Present.

W. P. Grant, Esq., in the Chair; Lt.-Colonel Forbes, Messrs. Ward, Frith, Heatley, Dr. W. B. O'Shaughnessy, Secretary, Mr. Bolst, Accountant, in attendance.

The Second Report of the Finance Committee having been read, the Committees proceeded to examine the items of the proposed scale of expenditure in each Department.

ORIENTAL PUBLICATIONS.

The Committees of Papers and Finance recommend that Government be respectfully solicited to permit the Society to defray from the monthly allowance of 500 Rs. for Oriental Publications, 1st, the expense of the custody of the works now in store (for which a sum of 78 rupees

per mensem allowed by Government has lately been withdrawn), and 2d, the cost of the publication in the Society's Transactions and Journal of all papers on Oriental Literature, History, Antiquities, Geography and kindred subjects of research.

MUSEUM OF ZOOLOGY AND NATURAL HISTORY.

Read Mr. Blyth's letter to the Finance Committee, dated 17th July, 1846, objecting to the scale proposed, namely, Co.'s Rs. 392 per mensem, as very inadequate, and not more than the amount of salary and house-rent promised by the Society to Mr. Blyth from July, 1844, payable on his completion of the MS. of the "Burnes" drawings.

The accounts handed in by Mr. Bolst showed, that Mr. Blyth and his establishment at present draw,

Mr. Blyth's Salary,	Rs. 250
Establishment	135
Contingencies,	105
	<hr/>
	Total, Rs. 490
Of which Government allow Salary,	250
For specimens,	50
	<hr/>
	Total, Rs. 300
Leaving 190 Rs. as the amount now paid from the Society's own funds, while Mr. Blyth claims an addition to his own salary,	Co.'s Rs. 100
House rent,	40
Additional Allowance for establishment,	50
	<hr/>
	Co.'s Rs. 190

The Committees, on the testimony of Messrs. Torrens, Heatley and Frith, that the Society did duly and at a general meeting pledge themselves to the increased allowance claimed by Mr. Blyth, and with reference to that officer's zealous exertions and the very great augmentation and improved arrangement of their Zoological collections effected by his labours, unanimously recommend to the adoption of the Society the subjoined resolution :—

“ That on the testimony of Messrs. Torrens, Frith and Heatley to the fact of Mr. Blyth’s claim for an addition to his salary of 100 Rs. per mensem from July 1844, on his completion of the MS. of the “ Burnes” drawings, being in conformity with a regular vote of the Society, the Society stands pledged to the obligation, and directs that the sum due be paid accordingly on the “ Burnes” MS. being finished and delivered to the Secretaries ; that it be notified to Mr. Blyth that the Society find with much regret the state of their funds compels them to return to his original salary of 250 Rs. with 40 Rs. for house-rent per mensem from the 1st of January, 1847, but that on their means permitting it they will have pleasure in increasing his salary and the allowance for his establishment to the total sum of 580 Rupees per mensem.

MUSEUM OF ECONOMIC GEOLOGY.

[The Report on this head still remains under consideration.]

LIBRARY AND SECRETARY’S OFFICE.

The Committee of Finance have recommended 350 Rs. per mensem for the Secretary’s office and Library, while the present expenses stand,

Library, including office establishment,	Rs. 414 0
Secretary and Accountant’s office,	95 12

Rs. 509 12

The Committees consider the subjoined arrangement deserving of adoption by the Society :—

Salary of Librarian,	Rs. 100
Accountant,	60
Purchase of Scientific Journals and Stationary,	100
Servants—Peons, Writer, Sircar,	90

Rs. 350

The Committees recommend that *Baboo Rajender Mittro* be appointed *Librarian* and *Assistant Secretary*, on a salary of 100 Rs. per mensem. The appointment to be on trial for six months ; that the Librarian be required to attend in the Library from 10 to 4 daily, Hindu Holidays included ; and that in his capacity of *Assistant Secretary* he correct all proofs, and prepare all routine letters for the Secretary’s office.

JOURNAL, RESEARCHES AND PRINTING.

The Committees recommend that the sum suggested by the Finance Committee. viz. Co.'s Rs. 475 per mensem, be adopted for this head of expenditure, and also that part of Mr. Torrens' stock of the back numbers of the *Journal* be reserved for the use of the Society to the value of Co.'s Rs. 1500.

CONTINGENCIES.

For this head the Finance Committee proposed the sum of Rs. 100 per mensem, the Committees now suggest that this item remain open to future consideration and arrangement.

A letter having been read from Mr. Torrens' to the Co-Secretary regarding the accounts and expenditure of the Society during his secretariat—

It was resolved unanimously and directed to be laid before the next general meeting for record.

That the Committees beg leave to repeat prominently the previous declaration of the Finance Committee, that the confusion in the accounts of the *Journal* arose entirely from an accidental omission and error on the part of the accountant, and further that they consider that every act of Mr. Torrens, in the management of the Society's pecuniary affairs has been done most openly and with their full cognizance and sanction.

W. P. GRANT, *Chairman.*

The above Report was fully adopted by the Society.

It was proposed by Dr. O'Shaughnessy, seconded by Mr. Laidlay, and carried, that Colonel Forbes, Captain Marshall and C. Huffnagle, Esq. be requested to act as *Auditors* of the Society's accounts for the remainder of the current year.

Captain Marshall and the Rev. Mr. Long having expressed their opinion that the Philological objects of the Society were not duly considered in the arrangements for the Secretariat.

It was proposed by Dr O'Shaughnessy, seconded by Mr. Laidlay, and carried unanimously, that Captain Marshall, the Rev. Mr. Long, the Rev. Dr. Hæberlin and Dr. Roër should be constituted the nucleus of an oriental sub-committee or section, for advice and reference to on all matters connected with oriental literature.

It was further proposed by the Rev. Mr. Long, seconded by Dr. O'Shaughnessy, and carried, that Dr. Roër be elected a Co-Secretary of the Society in the oriental literary department.

List of Books received at the Meeting of Wednesday, 4th November, 1846.

PRESENTED.

- 1.—Meteorological Register for September, 1846, kept at the Surveyor General's office.—BY THE SURVEYOR GENERAL..... 1
- 2.—The Calcutta Christian Observer for Nov. 1846.—BY THE EDITORS.... 1
- 3.—The Oriental Christian Spectator for October, 1846.—BY THE EDITOR.. 1
- 4.—The Registers of the Anemometer and Pluviometer and Tide Gauge kept at Kyouk Phyou for September, 1846.—BY THE SUPERINTENDENT OF MARINE..... 1
- 5.—Transactions of the Leeds Philosophical and Literary Society, Vol. I. Part I.—BY THE SOCIETY. 1
- 6.—Laws and Regulations of the Leeds Philosophical and Literary Society, pp.—BY THE SOCIETY..... 1
- 7.—Annual Report of the Leeds Philosophical and Literary Society for 1840, 41, 42, 43, 44, pp.—BY THE SOCIETY..... 4
- 8.—An Account of an Egyptian Mummy, pp.—BY THE LEEDS PHILOSOPHICAL AND LITERARY SOCIETY 1
- 9.—A Poetical Work, or Musnavie, in the Urdu language, by Maharaja Aparvu-Krishna Bahadur.—BY THE AUTHOR, 1

EXCHANGED.

- 10.—Journal Asiatique, Quatrieme Série, Tome VII. No. 34, Mai, 1846. .. 1
- 11.—Calcutta Journal of Natural History, July, 1846..... 1
- 12.—London, Edinburgh and Dublin Philosophical Magazine, No. 192. Aug. 1846..... 1
- 13.—Journal of the Agricultural and Horticultural Society of India, Part II. Vol. V. 1
- 14.—The Quarterly Journal of the Geological Society, No. 7, August, 1846.. 1
- 15.—Annales de la Société Royale d'Agriculture, Histoire Naturelle de Lyon, Tome VII. 1845. 1
- 16.—The Athenæum, Nos. 982 and 983, August 22d and 29th, 1846. 2

PURCHASED.

- 17.—Journal des Savans, Juin, 1846. 1
- 18.—Gould's Birds of Australia, No. XXIII. 1

The thanks of the Society were unanimously voted to the several learned Societies and individuals by whom the above contributions have been offered.

Oriental Literature.

Read letters from Major Troyer, Professor Lee, Dr. Von Martius, M. Jules Mohl, Mr. Ellis, Dr. Sprenger, the Maharaja Apurva Krishna, all which communications were referred to the Oriental Sub-Committee for report and information. The subjoined Report has accordingly been drawn up by the Sub-Committee.

November 7th, 1846.

Meeting of the Philological Section, present—the Rev. Mr. Long, Dr. Roer, and Captain Marshall.

1. Read a letter from Professor S. Lee; he suggests to the Society the publication of an Arabic Dictionary the “*Sihah of Jowharri*,” with an appendix.

Resolved to refer the subject to Dr. Sprenger, and ask for information as to the expense of printing, size, &c. of the work, and anything else he may favor us with.

2. Read a letter from Maharaja Apurva-Krishna, presenting an Urdu *Musnavie*, written by himself.

Resolved, that the Raja be thanked for his present.

3. Read a letter from Dr. Sprenger, recommending the printing of a Persian History of Cashmere in original by Mahomed Azeem, at an expense (lithographed at Agra) of Rs. 400 (for 200 copies), and also an English Translation of the same by himself.

Resolved, to recommend the printing of the original, and to inquire of Dr. S. the expense of the same.

4. Read a letter from Moulavi Gholam Hyder, requesting patronage to four Arabic and Urdu books.

Resolved, that it be recommended that five copies of each be taken.

5. Read a letter from the Librarian of the Public Library, asking for certain oriental books.

Resolved, that a copy of each work published by the Society be presented, but many of the works belong to the Asiatic Society of Paris and are deposited for sale.

Received a communication from the Rev. Mr. Long, stating that a gentleman was about to print off Tabular Lists of some of the current words of the Aboriginal languages of India with a view to their being

distributed to intelligent individuals for the purpose of gaining additions to the stock.

Resolved, that the object is highly approved of and recommended for encouragement.

[Dr. Roer having left Calcutta for Moulmein immediately after the meeting of the Sub-Committee, the publication of the requisite extracts from letters referred to above is unavoidably suspended till Dr. Roer's return in December.—W. B. O'S.]

General Correspondence.

Read the following letters from Major Williams, descriptive of the recent volcanic eruption at Kyouk Phyoo.

Kyouk Phyoo, 26th October, 1846.

MY DEAR SIR,—About quarter to 9 o'clock last night, we had an eruption of one of our Volcanoes near the village of Chein Kroong, about three or four miles from this station, on the island of Ramree—it burst out suddenly with a slight noise, emitting a brilliant flame, which instantly went out, and again burst forth; this happened for fifteen or twenty times, when the flame burnt steadily, gradually diminishing, and disappeared altogether about daybreak, or a little before it, this morning; it rained heavily all the time.

The whole sky was illuminated brilliantly, and again suddenly every thing was immersed in darkness during the flashes and their sudden disappearance, which I can only compare to the effect, on a small scale, of a handful of oil, or any combustible matter being thrown into a fire.

I have sent out ten coolies to collect stones, mud, &c. and hope to be able to send you some by the Steamer with this letter.

Your's sincerely,

D. WILLIAMS.

The flashes were exactly similar to those we saw out at sea two years ago, only that in this Volcanoe we saw the flame, there is therefore no doubt but that a Volcanoe burst out of the sea at the time I allude to, and which some attributed to a vessel on fire.

Oct. 28th. I send you specimens under the care of Ensign Anderson of the 25th.

Kyouk Phyoo, 28th October, 1846.

MY DEAR SIR,—I have had a more correct description of the Volcanoe to-day—the size of the Crater is about six feet in diameter only; surrounded on all sides to some extent with soft mud knee-deep, and the jhow or Cassuarino trees growing around unhurt, in a regular manner as if planted there; no other kind of trees near, and of course all other vegetation covered with the mud thrown out. It is still burn-

ing, and it is just now a place of resort by these superstitious people who make offerings to the Naga, the cause of earthquakes and volcanoes. It appears that there is no hole where the flame (still burning and about two feet high) issues from, it comes up through the soft mud.

Your's sincerely,

D. WILLIAMS.

I now fill up a one dozen case full of the stones, mud, &c. collected from the volcano's mouth.

Read the following letter from Captain Durand, Commissioner Tenasserim Provinces, relative to his visit to the Salones tribe.

(Copy.)

No. 324.

From Captain H. M. DURAND, Commissioner Tenasserim Provinces,

To F. J. HALLIDAY, Esq. Secretary to the Government of Bengal, Fort William.

Dated H. Co.'s Steamer "Proserpine," the 11th April, 1846.

SIR,—I have the honor to report that when proceeding from Mergui to the Pak Chau, I gave permission to Mr. Brayton, of the American Baptist Mission, to embark on board the H. Co.'s Steamer "Proserpine," and on passing the Island of Lampee, he was landed in Marble Island Bay.

2. The object of this gentleman's visit to the island of Lampee was of a purely missionary character with reference to the Salones.

3. I took advantage of his visit to request that he would have the goodness to assemble as many of the Salones as could conveniently be brought together, in order that on the return of the Steamer I might have an opportunity of communicating with them.

4. On my return from the Pak Chau to Marble Island Bay, I found forty Salone boats assembled. Each boat was said to contain on an average ten individuals, men, women and children. The boats were excellent, and the appearance of the people neither so savage nor miserable as from their mode of life might have been anticipated. They were decently clad and seemed not at all deficient in intelligence.

5. The humane exertions of my predecessor to induce these people to enter upon a more civilized mode of life, and to attempt cultivation, and the formation of villages failed; but encouraged by the example of a Salone family from one of the islands to the southward of our territories, the Lampee Salones are now meditating the establishment of two small villages, one of six and another of five houses. The Salone who has set the example has cultivated between two and three acres. The family state that the islands to the southward of the British territories are frequented by Salones in greater number than those in the Mergui Archipelago, and that some of the Southern Salones have taken to cultivation and form permanent villages. The language is the same with that of the Salone of the Mergui Archipelago.

6. Although the exertions of my predecessor failed in one respect, his liberality and the application of Mr. Brayton have succeeded in another and a very important particular. Mr. Brayton having acquired some knowledge of the Salone language, has taught several of them to read, and there is every probability of his Salone school being increased during the approaching rains. I forward three copies of the first Salone work, a small primer.

7. One of my objects in assembling the Lampee Salones was to ascertain whether they had during this dry season been visited by Malay Boats, their great dread. I was happy to learn that these timid unresisting people had during the dry season been free from molestation, and carried on their Sea Slug collections undisturbed and successfully.

8. Formerly the Salones paid a tax to Government of 3 rupees a boat, the tax was discontinued by my predecessor, and I have not imposed any new one upon them, nor do I intend it. Their Sea Slug collection is not unproductive, the slug selling at the rate of 30 to the rupee; but with the exception of a few mats, the making of which is the S. W. monsoon occupation, the slug forms their only wealth; it is caught or rather dug up, during the N. E. monsoon, at the period of low water in spring tides, and it is from the value of this article in the Mergui market that they obtain the means of purchasing rice, salt, and clothes. Their food is rice, fish, and shell fish; a few hogs are caught and killed by the aid of their numerous dogs, and some of the Lampee Salones had fowls with them. When as frequently occurs, the Salones have expended their rice, they have resort to a wild root which grows in abundance, and which after much maceration in water, parts with its poisonous matter, and becomes safe and edible.

9. I have no means of ascertaining or estimating the number of Salones in the Mergui Archipelago. Any guess must be a very random one. At Lampee, a favorite Salone place of resort, I suppose that instead of forty, with timely warning, nearly 100 boats might have been assembled, but it is their best frequented place of wandering. What the forests are to the Karens, the sea and the coasts of the islands of the Mergui Archipelago are to the Salones. The latter having boats, dispense with houses altogether, and are therefore still more migratory in their habits than the Karens. These are habits which it will require much time and favoring circumstances to break.

I have, &c.

(Signed) H. M. DURAND,
Commissioner T. P.

(True Copy)

CECIL BEADON,
Under-Secy. to the Govt. of Bengal.

The Meteorological Registers kept at Kyouk Phyoo for September, 1846, were presented by the acting Superintendent of Marine.

Read a note from Captain Brodie to Major Jenkins, forwarding an Assam alphabet and numerals. (Referred to the Oriental Sub-Committee).

Mr. Piddington presented the annexed extract from Dr. Spilsbury's letter, forwarded with coins presented to the Society.

I send you some specimens of copper currency dug up at Irun Irun, (or Ariun of the maps,) famous for its lath, and an immense Burah, a drawing of which you will see in Asiatic Journal but I have not time to refer to the number.

NOTE.—Some of the supposed coins are evidently drops from small copper castings. Perhaps the castings of the very curious little relics themselves?

H. P.

A notice of the Nicobar islands was received from the Rev. L. Barbe and referred to the Committee of Papers.

(This valuable paper will be published in an early number of the Journal).

Read the following memorandum from Mr. Torrens, relative to the discovery of silver coins, and some remarkable specimens of pottery on Sagur island.

The accompanying specimens* of pottery are presented through Mr. R. J. Snell, C. S. They were brought from Sagor Island, having been found on what appeared the site of a deserted village not far from Sagor Point. The party who went on a pleasure excursion to explore the jungle and by whom these relics were discovered, met with a more than ordinary visitation from the effects of the pestilential tract into which they had ventured.

Having heard of coins having been found by some of the Lascars attached to the light establishment on Sagor Point,—information which he obtained from the Marine Superintendent's Office, to whom the coins (here exhibited) had been sent,—a European clerk, named Waller, employed as Accountant in the Calcutta Stamp Office, with the two friends, named Denham and Kay, went to explore the spot. They brought away the earthenware specimens which Mr. Waller intended for the Society's Museum, but before I could obtain particulars of this discovery from him, he was struck down, as also were his two companions simultaneously almost, with jungle fever, of which Denham and Waller died on the same day; the third person Mr. Kay, escaping death after a very severe struggle. While on their expedition

* Two images of the destroying power, in the shape of Kaloo Ræe and Dukhin Ræe. They are commonly revered about the Soonderbuns, and no wood-cutter, or hunter enters the jungle without *poaja* to them.

Two earthen lamp stands.

Various ordinary pots.

a native servant with them was carried off in the jungle by a tiger. These incidents give further evidence of the excessive danger attending the exploration of a naturally unhealthy tract at the most unhealthy season of the year.

The coins* silver and gold, together with a broken ring of base metal, were found in the jungle between the light-house stockade and the sea at Sagor point. Some of the lascars having been seen constantly at work in the jungle, were watched, and these coins found upon one of them, who sought to get away to Calcutta

under circumstances which excited suspicion. The silver coins are all rupees, and generally in good preservation: all are of Musalman kings. The coin put apart in paper is a good specimen. Its legend is as noted marginally. A great

number of them belong to one coinage bearing on the reverse (No. 2 legend). I have not had time to go through them all, nor identify their era. Some are in the hands of a native friend, and if returned to me I can easily classify or have classified the whole.

The gold coins are fanams, such as are, or were current in southern India. The base metal ring appears of the same composition with those fanams of zinc and silver, of which I found a large bagful in the museum without a trace of whence they came, or wherefore.

The character,† which is not Tamul, may lead to identify these coins, which when returned I will endeavour to do. The whole was most likely deposited on the shore of Sagor Island in the wreck of some native vessel.

Should the Society, or any members desire to possess any of these coins they can be taken rupee for rupee, and the gold at its value.

Nov. 4th, 1846.

H. TORRENS.

REPORT OF THE CURATOR OF THE MUSEUM OF ECONOMIC GEOLOGY FOR OCTOBER.

Geology and Mineralogy.

We have received from Professor Zipser of Neusohl in Hungary, in continuation of his letter, which will be found in the Proceedings for August, 1845, a box containing the first hundred of the collections offered by him.

I have translated Dr. Zipser's letter and catalogue; the letter is as follows:—

HONOURABLE SIRS,—I have received in due course the obliging letters of the illustrious Asiatic Society of Calcutta, and am happy to find that my proposal for the augmentation of the Museum was acceptable I have in consequence forwarded to Messrs. Waitjen and Co. at Bremen, a chest marked A. S. of B. No. 1.

† I have some reason to believe it to be the Musalman Chulia character.

It contains as a specimen, the first Century (hundred) of my Orycto Geognostical Mineral Collections of Hungary. Without waiting for the acknowledgment of it by your Honourable Society. I shall forward forthwith the second hundred and proceed with the despatch of others as time and stock will allow me. I flatter myself in this wise to be of some small service to the Scientific Institution of Calcutta. If the Honourable Society will favor me with the works published by it relative to the Natural Sciences, that is to say "The Proceedings of the Asiatic Society,"* or with its works on Oriental Literature, I shall feel greatly obliged. I fear only the expenses of carriage. Those from Bremen I shall gladly undertake to pay. If my unpretending donation should come to the knowledge of the European-renowned Indian Baboo, Dwarkanath Tagore, and he should desire any of my collections for his son, who is studying in London, I shall be most ready to forward them to him. It will be of the highest possible gratification to me to have in this manner awakened in him a taste for Natural History.

The honourable Society's obedient servant, &c.

DR. ZIPSER, *Professor.*

Neusohl in Hungary, 18th March, 1846.

P. S.—As a devoted Coin-collector I cannot conceal my wish to obtain some large Asiatic Silver Coins, and I take the liberty thankfully to beg to be allowed to offer repayment of their nominal worth.

1. The largest silver money used in Bengal in the 19th Century.
2. The same from Bombay, Madras, Island of Ceylon, (one rix dollar,) Sumatra and Java.
3. The large silver coins of the settlements in India, Danish, French, Dutch, Portuguese.

All these are wanting in my collection, therefore I shall be most thankful if at least I can obtain a part of them.

H. PIDBINGTON, *Esq. Asiatic Society of Bengal, Calcutta.*

Bremen, 14th April, 1846.

SIR,—We have in due time received your valued lines of September last, accompanied by a letter of introduction of Messrs. Huschke, Wattenbach and Co., of your city, and with pleasure have offered to your correspondent, Professor Dr. Zipser, of Neusohl, in Hungary, our services for the purpose of forwarding any packages, he may have to send to you this way.

We have now received of him for your Society, (A. S. of B.) 1 box of minerals, which, in the absence of any direct opportunity for your port, we have shipped to London, as directed, to Messrs W. H. Allen and Co., Booksellers, there, requesting these gentlemen to forward the same by the first vessel, to your address.

For our expenses, viz.

* The Transactions are probably meant, but the Journal contains much more matter relative to the Natural Sciences.—H. P.

Freight and charges from Neusohl to Vienna,	f.	5	0
Freight from thence to Bremen,	f.	9	30
		<hr/>	
		f.	14 30
		or Rd.	9 59
Shipping charges here,	f.	0	63
Postage from Neusohl and Vienna to London,.....	f.	1	22
		<hr/>	

In all, Bremen Rix dollars, 12 0

We have drawn on Messrs. Hinck and Co., in Hamburg, who will recover this amount from you through their agents, Messrs. Huschke, Wattenbach and Co., of your city.

With a tender of our services in this place, we have the honor to be, &c.

D. H. WAITJEN and Co.

I trust that the Society will meet this liberal donation, which has been obtained by Circulars of the Museum of Economic Geology, republished on the continent by my brother at Brussels, in a corresponding spirit. Our reply to him offered in exchange what might suit his views, whether scientific or literary. And he has pointed out what would be agreeable to him.

Economic Geology.

Captain Ouseley has sent us from Chota Nagpore for Mr. Williams of Llandilo, a good supply of the Agalmatolite mentioned in my report of October, 1844, and June 1845, as that gentleman is desirous of having trials made of it. As it looks promising, I have requested Messrs. Lyall, Matheson and Co. to forward specimens to China, to learn if it has any commercial value with the Chinese, whose taste in the stones of this class used by them for ornamental work is peculiar, and to us quite unknown. Corresponding specimens are kept in the museum marked—

No. 1. Large flat Slabs.

No. 2. More massive kind, but in thick layers, and these may be always referred to.

At the August Meeting (I think) our Secretary handed to me a letter from the Secretary to Government of Bengal with a copy of a report from Dr. McClelland, respecting some Coal from Badam near Chota Nagpore, sent to Government by Lieut.-Colonel Ouseley.

As we had no specimen of this Coal I requested Colonel Ouseley to be good enough to furnish us with some, which he has, as usual, obligingly done; and specimens are on the table. Dr. McClelland has reported on this Coal, which indeed appears of a most promising quality, but its position, until we have a rail-road, is sadly against it.

A gentleman who does not wish his name to be known, has obliged us with three small but very pretty carved blocks of Chinese ornamental stone. The one is grey and is clearly an Agalmatolite; the second is probably the variety called Lardite by

some Mineralogists; and the third I should suppose to be a serpentine. These little specimens are too small and neat to spoil by chipping for further examination, but they serve to show the ornamental uses to which these minerals are so extensively applied in the east.

We received some time ago from Messrs. Fowle and Lonsdale of Moulmein a box containing upwards of thirty specimens of Ores from the Antimony Mines* near that place, with a request that they might be examined, their desire being of course to ascertain carefully and certainly if they contained any, and what, proportion of the precious metals. One of the Ores sent up was indeed a "supposed Antimonial silver."

Now, in complicated ores of this description, this sort of examination requires great care, time, and often repeated analysis, before a negative can safely be pronounced from a small specimen, to assure the miner or smelter who works on a large scale that nothing of value exists in his ores, and these references have thus occupied a very considerable portion of time and labour, and as is often the case in such investigations, have proved wholly unfruitful. Antimony, Iron, Arsenic and Sulphur with Bismuth, and in one instance a trace of Molybdena being all which can be discovered in them. The results have been sent to Messrs. Brightman, but are not worth detailing or printing.

I have suggested however to these gentlemen that they may find it well worth their while to sink a shaft "for a change of ores." As I now understand their operations they seem to be occupied with what one might call mere surface-digging rather than mining, and the pronouncing, as we must now do, that these ores contain nothing of value, is not to be understood as saying that the locality contains nothing, but merely that the ores *at the surface* have not been found valuable; which in Cornwall, and I think in Germany, is often thought to be a favourable indication.

We have received from Mr. Williams, the Hon'ble Company's Geologist, a collection of the Sandstone and Coal of the Burdwan district, collected by him in his survey, of which he has sent corresponding series for the Museum of the Hon'ble Company and for the National Museum of Economic Geology in London.

The proceedings of the evening were closed by a demonstration by the Curator of the Museum of Zoology, of numerous valuable additions to the Museum, acquired during the previous month.

REPORT OF THE SOCIETY'S ZOOLOGICAL CURATOR FOR THE MEETING HELD
NOVEMBER 4TH, 1846.

W. B. O'SHAUGNESSY, Esq., *Senior Secretary of the Asiatic Society.*

SIR,—Agreeably to your request, I resume the monthly publication of my reports of donations to the Zoological department of the Society's Museum, which the pressure of occupation and the impossibility of continuing regularly to treat the

* From an Estate belonging to Messrs. Brightman and Co.

subjects of my reports in such detail as was formerly my custom, and also my practice of embodying the substance of them in another form—as opportunities arose for treating on the different groups of animals they referred to, have conduced to occasion a very long suspension of their publication, which I trust will be in part remedied by that of a catalogue of the rich collection of Vertebrata now in the Museum. A brief summary notice of the objects presented to the Society during the past month, with the names of the several donors, is all that is now required of me, and as much as can be conveniently given on the present and similar occasions.

I have to acknowledge the receipt of a large case of specimens, despatched from London by Mr. Bartlett, and containing collections presented by several gentlemen to the Society, with the view both of assisting my researches, and some of them in return for specimens which I have formerly sent away on behalf of the Society. To Mr. W. Davison, proprietor of the Alnwick Museum, our thanks are especially due, for a very rich collection of British mammalia and birds, comprising various species that I greatly wanted, and some of considerable rarity. Among the mammalia are fine specimens of *Cervus elaphus* (imperfectly mature male), *C. dama* (remarkably fine), and *C. capreolus* (female); also an albino specimen of the common Seal (*Phoca vitulina*), an Otter (*Lutra vulgaris*), &c. &c.; with 112 specimens of British birds, for the most part in excellent order.

Mr. Kittland, of the Ashmolean Museum, Oxford, has also favored us with 50 species of British birds, comprising some that were very acceptable.

Mr. H. E. Strickland has presented a valuable labelled collection of mammalia, birds, reptiles, and shells, containing among the first *Rhinolophus hipposideros* and *Vespertilio pipistrellus*, among the third a nearly complete series of British reptiles, and 123 species of British shells, in general showing the progress from youth to maturity, and comprising many specimens of the great majority of the species. The birds consist, for the most part, of generic types, and are therefore of especial value, more particularly as they comprehend various rare species that had long been desiderata with me, from continental Europe, North and South America, Africa, Australia, and even Northern Asia.

Mr. Bartlett, in packing the above collections, added several interesting species from his own stores, as particularly some fine examples of the smaller British mammalia, a skull of the European *Bos taurus*, &c.

Mr. Stewart, of H. M. 50th Regiment, has sent from Allahabad, various reptiles and fishes preserved in spirit, and living specimens of *Aquila falvescens*, *Poliornis teesa*, *Urrua bengalensis*, and *U. umbrata*.

Mr. E. O'Ryley, of Amherst, various reptiles, fishes, and insects, preserved in spirit.

Captain Wall, of the 'Tenasserim' S. V., a remarkably fine specimen of the 'Tokké Lizard of the Tenasserim Provinces (*Platydictylus Duvauceleii*.) The range of this species extends northward into Arracau and Assam.

Mr. Birch, of the Pilot Service, various reptiles, fishes, and *Crustacea*, from the vicinity of the Sandheads.

Mr. Halfhyde, of the Preventive Service, a very fine specimen, just dead, of *Palæornis erythrogyens* of the Nicobars, also a stuffed example of *Ostracion cornutus*, and some other specimens.

Lastly, I must beg to express my thanks to the Joint-Secretary of the Society, J. Laidlay, Esq., for the assistance he has rendered in setting up Mr. Strickland's shells; and the acknowledgments of the Society are due to him for a variety of species (especially tertiary shells from the later deposits of the Paris basin), with which he has enriched its collection: and I must also bring prominently to your notice Mr. E. Lindstedt's volunteered services in setting up several skeletons of birds, (including a fine Emeu,) which, with a large collection of other skeletons yet in store, had been long awaiting their turn to be mounted, with no immediate prospect of it from the incessant demands of other duties upon the time of my subordinates.

In conclusion, I must take this opportunity of mentioning at least the names of some of the most liberal of the many contributors to our Zoological collections, during the last three years. It may seem almost invidious not to enumerate a still longer list, but the Society has been very greatly indebted to the exertions of Captain Phayre, and of Captain Abbott, in Arracan; of the Rev. J. Barbe, in Tipperah, the Tenasserim Provinces, the Nicobar Islands, and Penang; also of Captain Lewis, in the Nicobars, and at Tranquebar; of E. O'Ryley, Esq. of Amherst; of the Rev. F. J. Lindstedt, Malacca; of F. Skipwith, Esq. in Sylhet, Tipperah, and Chittagong; of Major Jenkins, in Assam; C. S. Bonnevie, Esq. Rungpore; Dr. Stewart, now in Allahabad; G.T. Lushington, Esq. Almorah;—not to mention more particularly Mr. Jerdon, Lord Arthur Hay, and Mr. Frith; and we have received highly valuable collections from the Royal University of Christiania; of Malayan species from the Natural History Society of Batavia; and of Australian from the Sydney Museum. Further collections are moreover at this time expected, and partly from new contributors and fresh localities; and we have every reason to hope and expect, under existing encouragement, that the Zoological department of the Society's Museum will continue to thrive as it has done, and to excite increasing interest with all whose tastes lead them to study the diversified tribes of animals, which in this country are everywhere so abundant, and yet so little generally known, for the most part, even to professed students of systematic Natural History.

I have the honour to be, &c.

E. BLYTH.

Proceedings of the Asiatic Society of Bengal, DECEMBER, 1846.

The usual monthly meeting was held on Wednesday evening, the 2d December.

The Hon'ble Sir J. P. Grant, in the chair.

The Senior Secretary read the proceedings of the last meeting.

Captain Marshall objected to the election of Mr. Torrens as a *permanent* Vice-President of the Society,—and the title of *Honorary* V. P. was accordingly substituted.

The proceedings were then confirmed.

Dr. Hough, Physician General, and *Lieut. Latter*, B. N. I. were ballotted for and duly elected members.

Dr. Duncan Stewart, was proposed by *Dr. W. B. O'Shaughnessy*, seconded by *Mr. Laidlay*.

Mr. Edgeworth, C. S. having returned from furlough, has notified his intention of rejoining the Society, and has been supplied with the back numbers of the Journal published during his absence.

The Senior Secretary produced the accounts of the past month, and stated that the debts of the Society, in conformity with the resolution of the monthly meeting of October, were all paid off, except the Bishop's College bills for printing, which would be discharged immediately; further, that funds were reserved to meet the liabilities arising from *Mr. Blyth's* claim, and the purchase of Journals from the late Secretary.

The Committee of Papers having deemed it necessary to make new arrangements regarding the Society's accounts, proposed the appointment of *Mr. J. Muller*,* on a salary of 60 Rs. a month.

Captain Marshall objected to the appointment, as the accounts would be kept at the Mint and rendered inaccessible to the members. He would prefer employing some native to act as Librarian and accountant, and keep the books, &c. at the Society's rooms.

* The principal accountant of the Mint.

The Senior Secretary explained that it was impossible for him to transact the business of the Society, and have its accounts and correspondence kept in order, unless the office establishment were situated where he had to pass the official day—Mr. Muller's great skill as an accountant was well known, and he would soon prove his usefulness to the Society. The accounts, the Secretary added, should be produced at each monthly meeting, and a copy laid on the Library-table during each ensuing month for general perusal.

Colonel Forbes, bore strong testimony to Mr. Muller's skill and to the necessity for adopting the arrangements proposed by the Committee of Papers.

The proposal having been seconded by Mr. Ward, was agreed to unanimously, Captain Marshall having withdrawn his objections.

By direction of the Committee of Papers it was communicated to the Society that a representation having been made by the Librarian of the property of the Society being in a most insecure state from 4 P. M. daily till 10 A. M. next day, valuable books, pictures, arms, &c. being left entirely open and only nominally in charge of the Durwans at the outer gate,—they had temporarily engaged as a night guard a European, (who brought certificates of good character,) at 40 Rs. and two native Chokedars obtained from Mr. McCann, Deputy Superintendent of Police, at 6 Rs. each. The Committee requested that this arrangement be confirmed by the General Meeting—as a *temporary* measure. (Approved accordingly.)

The Committee of Papers stated that they have requested sub-committees to visit and report on the state of the Library, and the museums, in the several departments.

The following list of Books was submitted by the Librarian.

Books received during the month of Nov. for the Meeting of 2d Dec. 1846.

PRESENTED.

1. Meteorological Register for October, 1846.—From the Surveyor General's Office.
2. The Oriental Christian Spectator, for November, 1846.—By the Editor.
3. Report on the Embankments of the Rivers of Bengal.—By the Government.
4. Report of the Mesmeric Committee appointed by the Government to observe and report upon Surgical Operations by Dr. Esdaile, two copies.—By the Government.

5. Proceedings of the Royal Society of Edinburgh, Nos. 27 and 28.—By the Society.
6. Tully's Offices.—By Mr. Parker.
7. Norris's Miscellany.—By Mr. Parker.
8. Two Treatises on Government, being Essays on Political Economy.—By Mr. Parker.
9. Boyle's Incentives to the love of God.—By Mr. Parker.
10. Labour and Indian Immigration question at Mauritius.—By H. Torrens, Esq.
11. The Calcutta Journal of Natural History, 4 Nos.—By H. Torrens, Esq.
12. Christa Sangita, 2 copies. (Sanskrit).—By H. Torrens, Esq.
13. Macnaghten's Muhammadan Law.—By H. Torrens, Esq.
14. Hindu Intelligencer, Nos. 1 to 3.—By the Editor.
15. Bacon Paraphrased ; or Annotations on Bacon's Essays.—By Babu Rajendralál Mitra.
16. Gelehrte Anzeigen, Vols. 6 to 21.—By the Royal Bavarian Academy.
17. Denkschriften ;—Abhandlungen der Königlich Bayerischen Akademie der Wissenschaften, Vols. 10 to 21.—By the same.
18. Akademischer Almanach auf das Jahr 1843, 44 and 45, 3 pamphlets.—By the same.
19. Die Japhetiden und ihre gemeinsame Heimath Armenien, 1 pamphlet.—By the same.
20. Gedächtnissrede auf Samuel Thomas von Sömmerring, von Dr. F. Dollingen, 1 pamphlet.—By the same.
21. Beleuchtung der Epikureischen Ethik, von Dr. Friedrich Arp, 1 pamphlet.—By the same.
22. Ueber das Studium der Griechischen und Römischen Alterthümer, von Ernst von Lasaulx, 1 pamphlet.—By the same.
23. Ueber die Vegetationsgruppen in Bayern, 1 pamphlet.—By the same.
24. Die Baukunst und ihre Bedeutung im Staate, 1 pamphlet.—By the same.
25. Ueber die Gorgonen Fabel, von Dr. Franz Streber, 1 pamphlet.—By the same.
26. Mannigfaltigkeit in der organischen und unorganischen Natur, von Franz von Kobell.—By the same.
27. Ueber die Nebelflecken, von Dr. J. Lamont, 1 pamphlet.—By the same.
28. Ueber Telegraphie, insbesondere durch galvanische Kräfte. Von Dr. C. A. Steinheil, 1 pamphlet.—By the same.
29. Mohammed's Religion. Von Joh. Jos. Ignaz Dollinger, 1 pamphlet.—By the same.
30. Ueber das magnetische Observatorium der Königl. Sternwarte bei München. Von Dr. J. Lamont, München, 1841, 1 pamphlet.—By the same
31. Betrachtungen über die Geschichte, von J. E. Ritter Von Roch-Sternfeld. München, 1841, 1 pamphlet.—By the same.

32. Rede zum Andenken an Ignaz Dollinger, Von Dr. Ph. Fr. v. Walther. München, 1841, 1 pamphlet.—By the same.

33. Geschichte der bayerischen Subsidien, vom Jahre 1740 bis 1762. Von Joseph von Stichauer, München, 1842, 1 pamphlet.—By the same.

34. Die Kartoffel Epidemie der letzten Jahre oder die Stockfäule und Räude der Kartoffeln, Von Dr. S. Fr. Ph. v. Martius. München, 1842, 1 pamphlet.—By the same.

35. Rede, gehalten zur 84sten Feyer des Stiftungstages der königlich bayerischen Akademie der Wissenschaften. München, 1843, 1 pamphlet.—By the same.

36. Deutsch und Welsch, oder der Weltkampf der Germanen und Romanen. Von Dr. Maassmann, München, 1843, 1 pamphlet.—By the same.

37. Rede zum Andenken an den hochwürdigsten Herrn Ignatz von Streber, von Dr. Franz Streber, München, 1843, 1 pamphlet.—By the same.

38 Die Geologie in ihrem Verhältnisse zu den übrigen Naturwissenschaften. Von Dr. Karl Schashautl. München, 1843, 1 pamphlet.—By the same.

39. Der Fortschritt der Sprachenkunde und ihre gegenwärtige Aufgabe, von Friedrich Windischmann. München, 1844, 1 pamphlet.—By the same.

40. Andeutungen zur Charakteristik des organischen Lebens, München, 1845, 1 pamphlet.—By the same.

Exchanged.

41. The Athenæum, for September 26th, 1846.

42. The London, Edinburgh, and Dublin Philosophical Magazine, No. 193.

43. Transactions of the Royal Society of Edinburgh, Vol. xvi. part. II.

Purchased.

44. The Annals and Magazine of Natural History, No. 118, September, 1846.

45. Journal des Savants, Juillet, 1846.

Read a note from Mr. Torreus, forwarding certain stray papers belonging to the Society.

Submitted M. S. from Mr. Blyth on the Zoology of the Nicobar Islands, and of Chusan, in elucidation of the Paper by the Rev. Mr. Barbe, and of Dr. Cantor's drawings.

Read a note from H. Brown, Esq. of Rangoon forwarding a box of fossil specimens from the Makkera Ming, brother to his Majesty the king of Burmah.

Read a note from Dr. Taylor, late Civil Surgeon of Dacca, forwarding revised copy of his remarks on the sequel to the Periplus of the Erythræan sea, first presented on the 6th of May.

Dr. O'Shaughnessy exhibited a specimen of *Schönenbein's* gun cotton obtained from Mr. J. W. Grant, gave an account of its properties and

added some conjectures as to its preparation, which though kept secret by the inventor, Dr. O'Shaughnessy said he believed he could readily describe.—The specimen was too small for analysis, but on microscopic examination by Mr. Grant, proved not to be imbued with any crystalline matters. Dr. O'Shaughnessy added that he had several years since observed numerous facts, during the destruction of organic matters by strong Nitric acid in medico-legal analyses, which convince him now that Schoenbein's gun cotton is prepared by the action of Nitric acid on that substance—which is thus converted practically into *solid Carbonic acid*. He had since receiving the specimen from Mr. Grant made several experiments which were quite sufficient to shew that by the action of Nitric acid at a properly regulated strength and temperature, on cotton, flax, tow, paper and other organic matters, a powerfully explosive compound is easily obtained.

Dr. Roer, the Co-Secretary, Oriental Department, stated, that he had received from Dr. O'Shaughnessy a letter from Major Jenkins, forwarding impressions of the coins of the Ahom kings, and also a correspondence between Major Jenkins and Captain Brodie, respecting the characters and numerals of the Ahom language, and vocabularies of the Ahom and Khamti languages.—He was of opinion from the specimens he had seen, that the Ahom vocabulary did not refer to the ancient Ahom language, a branch of the Shan, which had ceased to be spoken, and was only understood by the priests, the preservers of the ancient religious traditions, but that it appeared to refer to the common Ahom or Assamese language, which is very similar to the Bengali. The Khamti language, he further observed, was a dialect of the Shan, the characters however, Burmese, and he proposed, that Capt. Latter should be requested to report on this vocabulary for reference to the Oriental Section, while the Ahom vocabulary and the Ahom coins should be immediately referred to that Section.

Ordered accordingly, and Captain Latter appointed a member of the Oriental Sub-committee.

The Rev. Mr. Long submitted a statement of the price of grain at Chinsurah, showing the average for the last fifty years.

A lengthened conversation ensued regarding the neglect of the investigation of the Ajunta caves and other topics of antiquarian research for which the Society long since appointed a Special Committee, and Mr.

Laidlay was requested to examine the records of the Society and report on this subject.

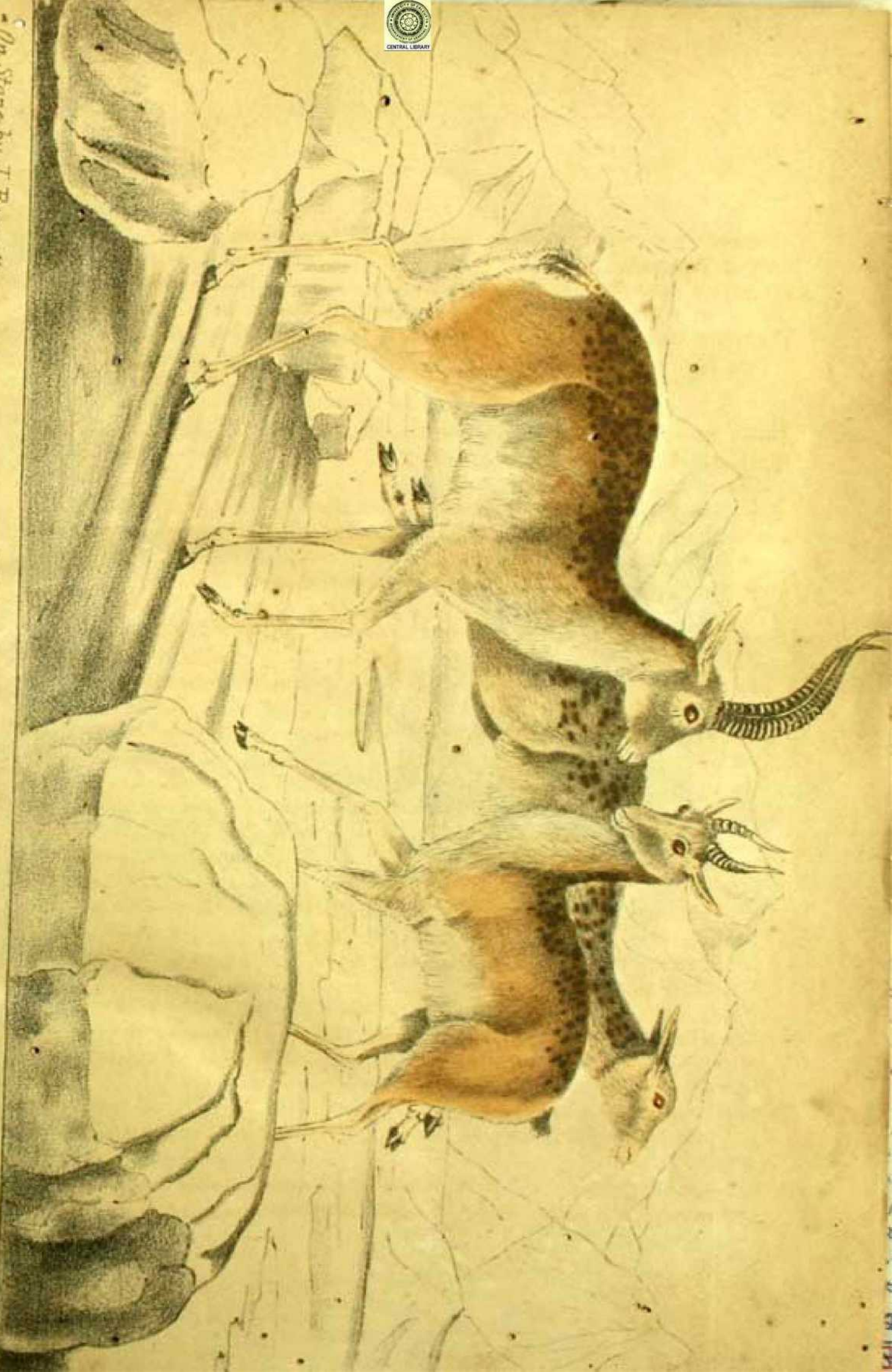
Mr. Blyth, Zoological Curator, read a list of books and periodicals he desired to have purchased for his department, and was requested to refer his wishes to the Committee of Papers in the regular course.

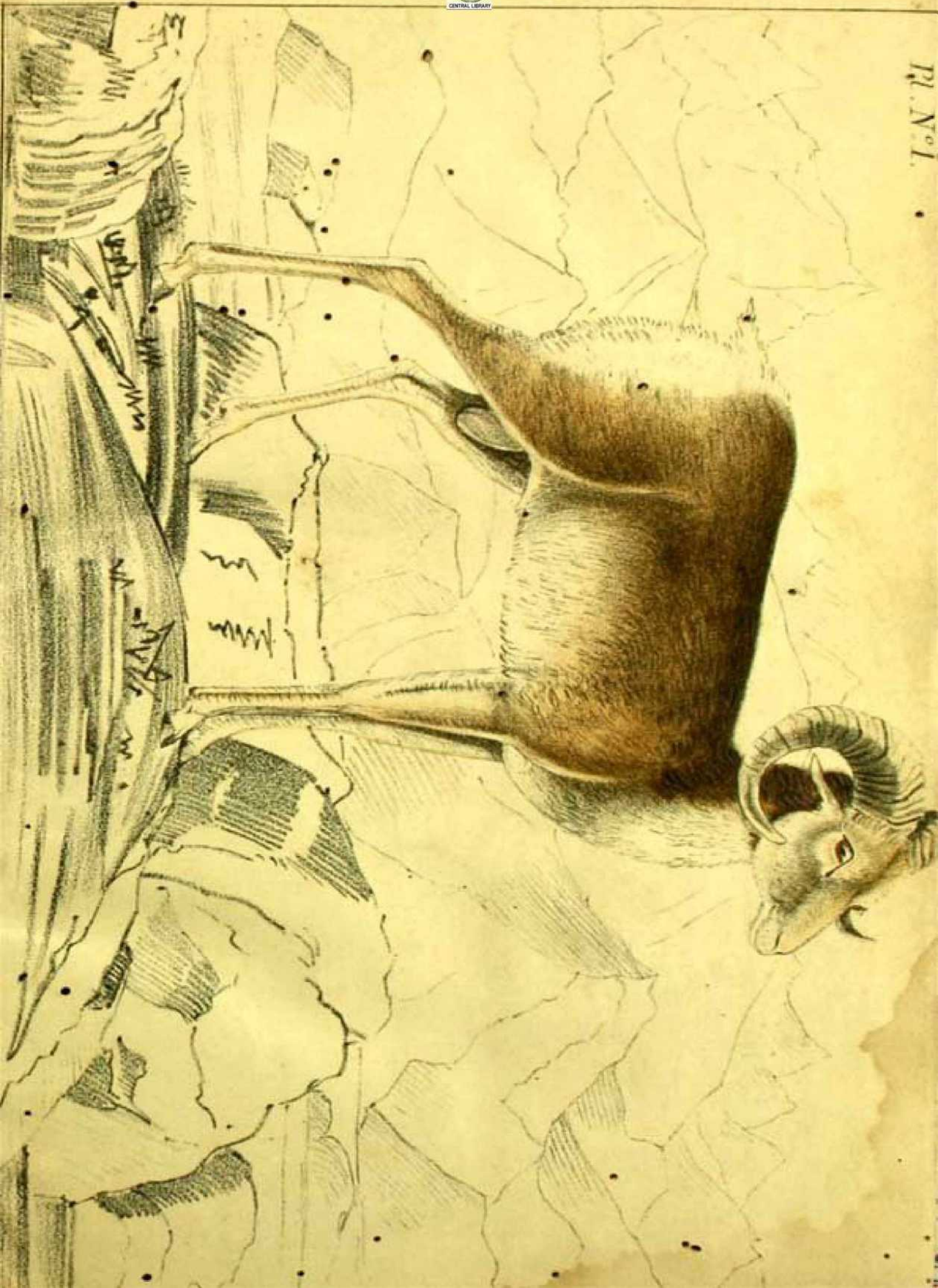


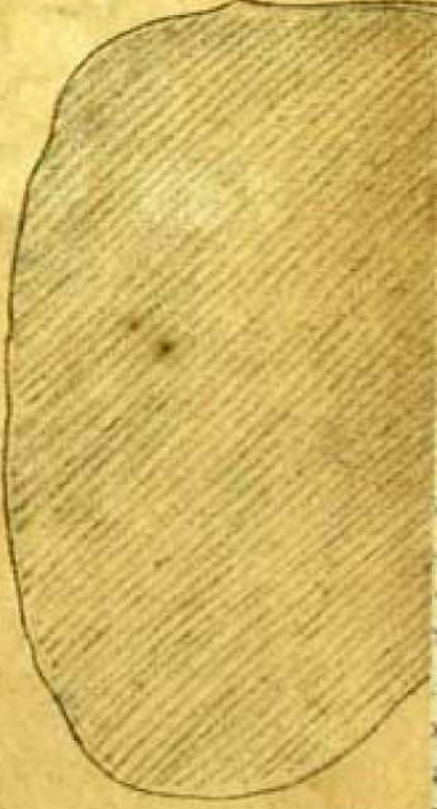
On Stone by J. Bennett

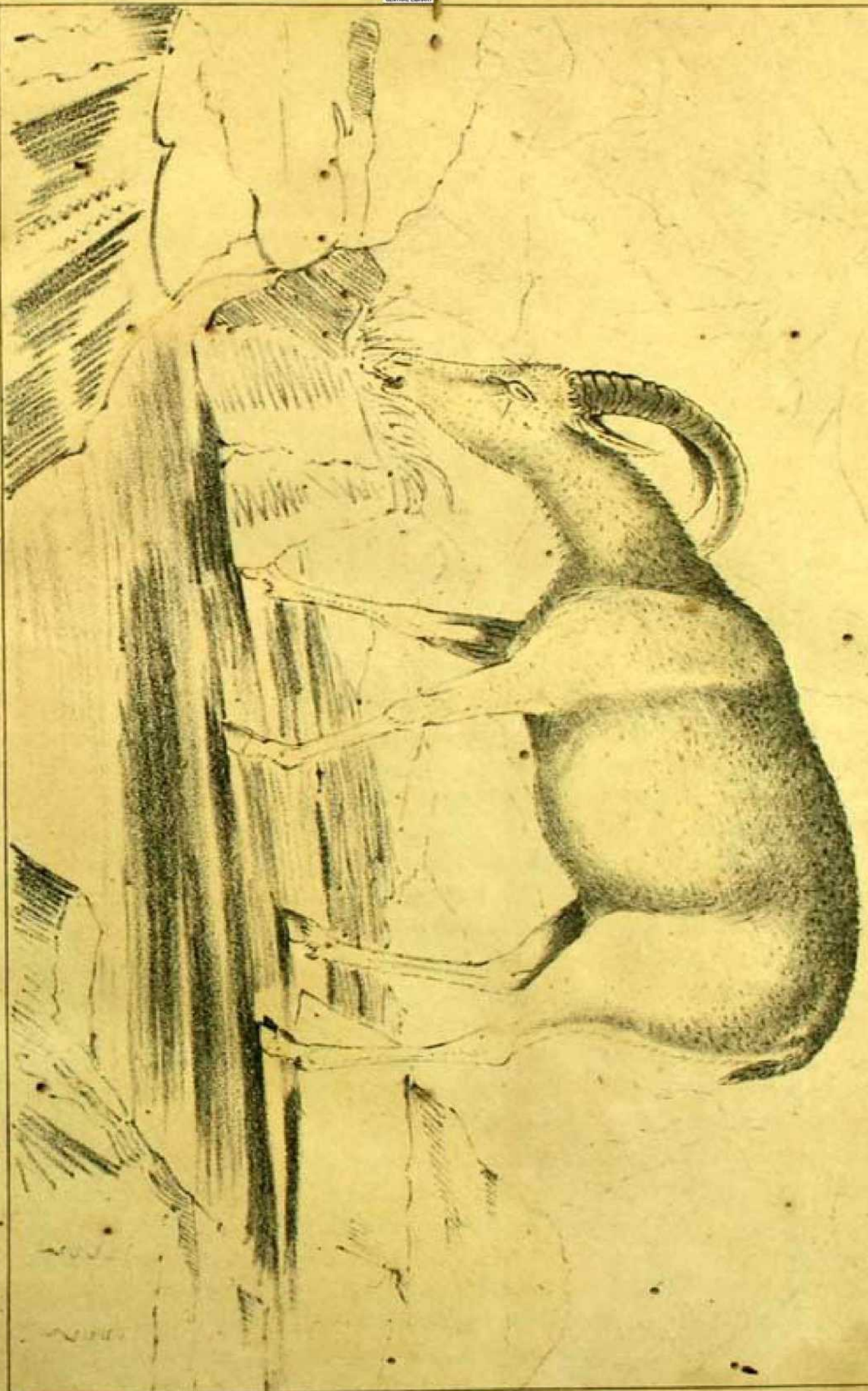
Procera micricaudata from Cap. of T. A.

Lithog. by T. Black









On Stone by J. Bennett.

*Ovis Ammonoides from
The Nyon of Helvet.*

Lithog. by T. Black Cat.

JOURNAL
OF THE
ASIATIC SOCIETY.

Notices and Descriptions of various New or Little Known Species of Birds. By ED. BLYTH, Curator of the Asiatic Society's Museum.

[Continued from Vol. XIV, p. 602].

Buzzards. *Archibuteo hemiptilopus*, nobis. Nearly allied to the Mexican *Arch. regalis*, figured by Mr. G. R. Gray in his illustrated work on the 'Genera of Birds'; having the tarsi, as in that species, feathered to the toes in front and externally, bare and scutated behind, and reticulated for a slight distance on either side, the latter being hidden by the feathers. Length, of probably a fine female, about twenty-eight inches, the wing twenty and a quarter, and tail thirteen inches; beak, from point to gape, two inches; and tarse exceeding three inches. Colour (of the only specimen examined) a rich deep fuscous-brown, slightly glossed with pink on the upper-parts; the inter-scapularies shading laterally to fulvescent: on the nape, the feathers are merely tipped with dusky-brown, the remainder being pure white, which shews very conspicuously: head mingled whitish and brown, the latter predominating on the crown, the former on the lower ear-coverts and throat: from the base of the lower mandible proceeds a large blackish moustache: breast fulvescent, the feathers more or less largely tipped with deep brown; and the abdomen, flanks, vent, lower tail-coverts, with the long tibial and the tarsal plumes, are of an uniform rich very dark brown throughout, approaching to blackish: primaries dusky, paler above the emargination of their outer webs, and the smaller primaries and the secondaries are

obscurely, though distinctly, banded : internally, the large alars are white at base, as in other Buzzards : tail barred throughout with many narrowish undulating bands, alternately dusky and paler, becoming successively more obscure towards the base, and the subterminal dusky band broadish ; beneath, the tail is albescent to near its base, and the stems of the caudal feathers are very white, both above and below. Beak dusky horn-coloured, yellowish laterally at base of mandibles, and with apparently a livid wax-coloured cere : the toes also, and hind portion of the tarsi, livid waxy ; and the talons horny-black. A very splendid species, from Darjeeling.

Another fine Buzzard, the *Buteo aquilinus*, Hodgson, nobis, *J. A. S.* (March) 1845, p. 176, has since been described by Mr. Hodgson by the name *B. leucocephalus*, in *Proc. Zool. Soc.* (April) 1845, p. 21, 37. where he speaks of it as "peculiar to the Cachar and Tibet." I repeat my former suggestion, that it is probably the *Falco asiaticus* of Latham, described to inhabit China.

A third was described by Mr. Hodgson, in the 'Bengal Sporting Magazine,' for 1836, p. 182, by the name *Circus plumipes*, which he has since altered to *Buteo plumipes*, *Proc. Zool. Soc.* 1845, p. 37, though retaining his opinion of its near affinity to *Circus*.*

A fourth is the *B. canescens*, Hodgson, (vide *J. A. S.* XII, 308,) which is decidedly the 'Nasal Falcon' of Latham ; and Mr. Jerdon now identifies with it his *B. longipes*, and I much suspect that *B. rufiventer*, Jerdon, is merely a small male of the same. Also, I think that *B. pectoralis*, Vieillot, will prove to be no other, in which case this last specific name will have to be retained. I have procured specimens of this bird in the neighbourhood of Kishenaghur and Moorshedabad, in Lower Bengal, and have picked up an undoubted feather of it in a mangoe tope much nearer to Calcutta ; but in the vicinity of Calcutta it must be very rare, if it occurs at all ; preferring a more open country.

* Mr. Hodgson has recently written me word that the *Buteo plumipes*, *loc. cit.*, "is a *Circus* osculant to *Buteo*, as *B. aquilinus* (v. *leucocephalus*) is a *Buteo* osculant to *Aquila*. The latter is not a typical *Buteo* or *Archibuteo*,—witness its reticulate tarse, &c. &c. This species is inserted incorrectly in the 'Proceedings of the Zoological Society.' Instead of *plumipes* belonging "to *Buteo* proper and not to *Circus*," it should have been 'belongs not to *Buteo* but to *Circus*.'—This species I have never seen, but must confess to theoretical doubts of its truly connecting *Circus* with *Buteo*: the latter genus and *Aquila*, on the other hand, are very closely allied, in fact but slight modifications of the same immediate subtype ; and species of intermediate character might have been looked for.

B. pygmaeus, nobis, *J. A. S.* 1845, p. 177, is a fifth decided species, from the Tenasserim provinces.

To the genus *Spizaëtus* of Vieillot, Mr. G. R. Gray refers *Nisaëtus* of Mr. Hodgson as a synonyme (as I formerly did, in *J. A. S.* XI, 456, and XII, 305); thus bringing together certain species of the Old World and of the New, concerning which suspicion at least of respective generic diversity had been entertained. *Morphnus* of Cuvier, however, which had generally been placed as synonymous with *Spizaëtus*, is confined by Mr. Gray to certain naked-legged species of South America, as *M. urubitinga* and its affines; and, finally, *Limnaëtus*, Vigors, is referred by the same systematist to *Spizaëtus*, though to judge from Dr. Horsfield's figure and description of *L. unicolor* (its type), he would scarcely seem justified in doing so.

Upon a former occasion (*ante*, p. 176), I indicated the four Indian species of undoubted *Spizaëtus* (vel *Nisaëtus*), after describing what I conceived to be a new species of the form from Malacca, by the name *Nisaëtus alboniger*.* This last, however, proves to be decidedly the true *Falco caligatus* of Raffles, (as was first pointed out to me by my friend Dr. Cantor,) and will therefore now range as *Sp. caligatus*, (Raffles): consequently, it remains to determine what specific name the common Bengal species, which I formerly conceived to be *caligatus*, should retain; and this will probably be *nipalensis*, (Hodgson,) since considerable doubt must attach at present to the identification of it with the Javanese *Falco niveus* of Temminck. The species in question is the *Bauj Eagle* and *Nerwied Eagle* of Latham, but does not appear to have received a distinctive systematic name prior to that bestowed by Mr. Hodgson, and which should refer exclusively to his supposed crestless variety of the species, which usually presents a mere rudiment of an occipital crest, very rarely further developed; though I have obtained one middle-aged specimen (out of several dozens,) with a crest two inches long.† This bird would appear to be very rare in the Himalaya, while in the plains of Lower Bengal it is extremely numerous. I lately saw one specimen in a large collection from Darjeeling: but Mr. Hodgson's supposed crested variety of the species, subsequently

* Also described under this name by Lord Arthur Hay, *Madr. Journ.* No XXXI, 145.

† More recently, also, another and younger specimen, with a slight crest, though still very unusually developed for the species.

termed by him *N. pallidus*, and which I refer to *Falco indicus cirratus* of Ray (v. *F. cirratus*, Shaw), seems to be exclusively a hill bird, as are also our other crested species, *Sp. pulcher* and *Sp. Kieneri*.

The variation in development of crest here noticed of *Sp. nipalensis*, is both curious and instructive: a tendency to such prolongation of the central occipital plumes being observable in various other *Falconidæ*, as especially in *Hieraëtus* (Kaup, v. *Aquila*,) *pennatus*, and slightly in *Buteo canescens*; while in the Indian *Pernis*, which is currently regarded as a peculiar species by the name *P. cristata*, the crest is very commonly reduced to a mere rudiment (which might remain unnoticed if not looked for), while in other specimens the feathers composing it are prolonged an inch beyond those they immediately impend. Hence I have some suspicion whether the species is really distinct from *P. apivora*; and I also doubt whether more than a single species of this very variable bird has been yet discovered. All those which are mentioned by Mr. G. R. Gray, I would thus provisionally reduce to one, with the exception of my *Lophastur Jerdoni*, (*J. A. S. XI*, 464,) which is erroneously referred by Mr. Gray to this genus; it being strictly an aberrant *Baza*, and perhaps identical with *B. magnirostris* of the Philippine Islands, mentioned by Mr. G. R. Gray, though I suspect as yet undescribed.* While on this group, I may further remark that *Buteo cristatus*, Vieillot, has been currently regarded as a synonyme of *Baza lophotes*; but, as described in the *Dict. Class.*, where moreover Australia is assigned as its habitat, it can neither be *B. lophotes* nor *B. subcristata* figured in Gould's 'Birds of Australia'; and if not a "*Buse Bondrée Huppée*," as he terms it (or Honey Buzzard), it is not probably the young of *Aquila ? morphnoides*, Gould, exhibiting a coloration analogous to that of the immature plumage of its nearly allied congener, *Hieraëtus pennatus*, and in such case ranking as *H. cristatus*, (Vieillot).

* I had scarcely written the above, when the Society received a second fine collection of Scandinavian objects of Natural History from the University of Christiania. A specimen of *Pernis apivora* is included, and I find the species is distinct from *P. cristata*: the great variation of plumage is the same in both, and the varieties correspond; but in *P. apivora*, in addition to there not being the slightest tendency to the formation of an occipital crest, the beak is conspicuously smaller, and the toes are much shorter. Thus, in two specimens of exactly the same general dimensions, the middle toe of *P. apivora*, from its separation from the next to the insertion of the talons, measures an inch and a half; while in *P. cristata* it measures an inch and seven-eighths, with the rest of the foot in proportion. The reticulate scutation of the leg and foot is also much more prominent than in *P. apivora*.

Among the true Hawks, we have a similar occipital crest in *Astur trivirgatus*, (Tem.,) to which may be referred *A. indicus*, Hodgson, (*Beng. Sp. Mag.* 1836, p. 177,) it being also the supposed *A. palumbarius* of Mr. Jerdon's Catalogue. The Society has lately received fine specimens of this Goshawk from Yé (Tenasserim), forming part of a valuable collection from that province, presented by the Rev. J. Barbe, R. C. M.*

Of Indian true *Aquila*, as Mr. G. R. Gray now adopts the genus, as many as nine species exist, which are as follow:—1. *Tolmaëtus*† *Bonelli*, the *Nisaëtus grandis*, Hodgson, and 'Genoese Eagle' of Latham: peculiar to hilly regions.—2, *Aq. chrysaëtos*: Himalaya, and perhaps Col. Sykes's Dukhun bird, though Mr. Jerdon's supposed 'Golden Eagle' of South India, refers to the next species.—3, *Aq. mogilnik, imperialis*, and *heliaca*, Auct. India generally, chiefly however the mountains. Of this robustly formed Eagle, there are two phases of plumage. One is the dark brown, with pale head and nuchal plumes, blackish forehead and throat, and often a great white patch on the shoulder: the other has pale central stripes to the feathers of the back, which are much broader on those of the neck and under-parts, where they have merely dark lateral margins, and the wing also is more or less spotted; in the latter plumage, the feathers of the back and especially those of the breast and under-parts are considerably more lengthened, attenuated and pointed, than in the other; and the dress certainly does not appear to be juvenile, but analogous rather to the spotted garb of *Aq. nævia*. To judge from Hardwicke and Gray's figure, it might be thought the immature plumage of *Aq. bifasciata*, but such is not the case.—4, *Aq. bifasciata*, Gray, v. *nipalensis*, Hodgson, *As. Res.* XVIII, pt. II, p. 13. Equal to the last in size, but less robust; and colour a dead brown, with the secondaries and great range

* Dr. McClelland has lately favoured me with permission to look over his drawings of Assamese animals; among which is one of his *Spizaëtus rufitinctus*, *Proc. Zool. Soc.* 1839, p. 153, which I consider merely to represent the adult female of *Astur trivirgatus*.

† This group comprises *T. Bonelli* of Southern Europe and Asia, and I believe North Africa; and *T. bellicosus*, v. *armiger*, (Shaw,) of South Africa. Mr. Hodgson thinks that his name *Nisaëtus* should now stand for this form; but as he has figured *nipalensis* as the "type of the new genus *Nisaëtus*," *J. A. S. V.* 227, and subsequently characterized that form as short-winged, VI, 361, and elsewhere spoken of *grandis* as "an aberrant species," I am compelled in this case to dispute his claim to the sponsorship, however unwillingly.

of coverts tipped with fulvous-white, forming two conspicuous bars on the wing; lower tail-coverts also fulvous-white, and tail tipped with the same: wing twenty-two inches. A rare species, inhabiting mountainous territory, and chiefly the Himalaya. Capt. Phayre has favoured the Society with a very fine specimen from Arracan.—5, *Aq. navia*, (Gm.); 'Spotted Eagle,' 'Rough-footed Eagle,' and 'Brown-backed Eagle, Var. A', of Latham. A beautiful and very variable species in its colouring, allied in form to the last, but smaller; and larger, but less robust, than the next. Fine adult males are richly empurpled brown, with fulvous-white terminal stripes, more or less developed, on the interscapularies, scapularies, and smaller wing-coverts; larger and pure white spots on the greater coverts, and two white bars tipping the secondaries and largest coverts, as in *Aq. bifasciata*; tibial plumes similarly spotted, the under tail-coverts and generally the short tarsal plumes white, and the abdomen streaked with fulvous; cere, orbits, and toes, beautiful yellow: wing generally about twenty inches. Others have the streaks of the upper parts much more developed, but the white dingy and subdued, and the dark colour generally paler: such are mostly females; and others again, especially of the latter sex, are dull brown throughout (inclusive of the lower tail-coverts), with sometimes paler head and neck-hackles, the latter being however generally, though still not always, tipped paler. This Eagle is very common in the Bengal Soonderbuns, and I have seen it also from the Himalaya, and from Central India.—6, *Aq. fulvescens*, *fusca*, and *punctata*, Gray and Hardwicke: *Aq. vindhiana*, Franklin. Smaller and more robust than the last, a miniature of *Aq. mogilnik*; wing eighteen or nineteen inches, rarely twenty. Some (females?) are uniformly deep fulvous-brown throughout: others light fulvous, brightest upon the head and throat, obscured and dingy on the back and scapularies, and whitish below, with dark shafts and bases of feathers; these appear to be the young: but the most characteristic plumage (that of the adult male?) is tawney or fulvous-brown, more fulvous on the neck-hackles, which are tipped paler; head and throat dusky, the coronal feathers tipped paler; wings, breast, and lower-parts, deep fuscous, the breast slightly speckled—and the belly and wings spotted and streaked—with light tawny-brown; wing-bars, and tail-tip, as in the two preceding species. Common in the plains of Upper India, and along the banks of the Ganges above Monghyr, also in the

peninsula; but I have never seen it from the Himalaya, nor from the Soonderbuns, where *Aq. nævia* is so abundant.—7, *Aq. hastata*; *Morphnus hastatus*, Lesson: *Spizaëtus punctatus*, Jerdon, *Supp.* This so much resembles *Aq. nævia*, that it requires some practice to distinguish the two species always, with certainty; and the same may be said of *Aq. nævia* and *Aq. fulvescens*; but the last named species could never be confounded with the present one. It is altogether a more feeble bird than *Aq. nævia*, with smaller bill and feet, and proportionally somewhat longer tarsi, but which appear considerably more so from their slenderness. Plumage variable; but colour always a dead brown, as in *Aq. bifasciata*; the neck-hackles smaller than in the other species. The finest adult male which I have procured has the coronal feathers lanceolate, and edged paler; a sort of supercilium formed by a range of feathers with small whitish tips; the nuchal hackles also tipped whitish, and the feathers of the lower neck have each a terminal white speck; three distinct ranges of white terminal spots on the wings; the tertiaries broadly whitish-tipped; the breast and flanks beautifully striped with a whitish medial streak to each feather, those of the belly having a further central dark one; and the lower tail-coverts and tarsal plumes are pale and mottled. Another adult male has the spots generally much less developed, but is otherwise nearly similar. Females are commonly darker brown, with no spots, except occasionally some on the smaller wing-coverts, and especially about the bend of the wing. The young are lighter brown, with sometimes, traces of streaks on the pectoral and abdominal feathers; and the interscapularies and tertiaries are dark, contrasting strongly with the whitish inner scapularies adjoining.—8, *Hieraëtus pennatus*, (Br.) Kaup; *Spizaëtus milvoides*, Jerdon: *F. lagopus*, Bengal variety, Latham. This form chiefly deviates from the robust typical Eagles in its small size, and proportionally small and Buzzard-like beak; also in shewing a tendency to exhibit an occipital crest; in which respect, as also in the whiteness of the under-parts in the young bird, it approximates the *Spizaëti*. *H. pennatus* has invariably a white shoulder-spot at all ages, and almost as constantly a white forehead. It is extensively distributed over the country.—9, *Ictinaëtus malaiensis*, (Reinwardt) Jerdon; *Aquila*, *Heteropus*, and *Neopus, perniger*, Hodgson: *Spizaëtus?? oivorus*, Jerdon, *Supp.* Remarkable for its very long wings; its blackish colour throughout, varied with white bands under the tail; and for the extraordinary disproportion of its front toes and claws, of which the inner is

particularly large, and the outer singularly small. Peculiar to mountain regions. This bird conducts in some respects to *Archibuteo*.

These several Eagles exhibit variation of habit, as of form. The *Ictinaëtus* is pre-eminently a nest-robber, and feeds much on eggs: vide *J. A. S.* XII, 128; where also is a notice of the nest-plundering propensities of *Aq. hastata*, under the supposition of the latter species being *Limnaëtus unicolor*. The more powerful of the tribe do not disdain to feed on carrion; and Mr. Elliot remarks, of *Aq. fulvescens*,—"The *Wokhab* is very troublesome in hawking after the sun becomes hot, mistaking the jesses for some kind of prey, and pouncing on the Falcon to seize it. I have once or twice nearly lost *Shaheens*" (*F. peregrinator*,) he adds, "in consequence, these flying to great distances for fear of the *Wokhab*." This is probably, therefore, the *Jimach* mentioned by Buchanan Hamilton, (in Montgomery Martin's compilation from his *MSS.* I, 505). "The only pursuit worth notice which I saw in several days' hawking," observes the author, "was from a large bird of prey named *Jimach*, which attacked a very strong Falcon as it was hovering over a bush into which it had driven a Partridge. The moment the Falcon espied the *Jimach* it gave a scream, and flew off with the utmost velocity, while the *Jimach* eagerly pursued. They were instantly followed by the whole party, foot, horses, and elephants, perhaps 200 persons, shouting and firing with all their might, and the Falcon was saved, but not without severe wounds, the *Jimach* having struck her to the ground. I have never been able," adds Buchanan, "to procure a *Jimach*; but it appears to be a small Eagle, and is said to live entirely on other birds of prey." *Aq. fulvescens*, however, is a very indiscriminate feeder, preying on rats, lizards, snakes, insects, and sometimes even carrion; besides hares, and in fact whatever, living or dead, it happens to meet with: still the fact of its attacking Falcons, or indeed of any bird of prey attacking another, except for combat, or as when a tame Falcon is flown at a Kite, (of Hawks thus "picking out Hawks' een,") is, I apprehend, little known to the majority of naturalists. Lastly, *Hieraëtus pennatus* is a noted robber of the dove-cot and poultry-yard; whose depredations, as Mr. Jerdon remarks, are probably often mistaken for those of the Kite.

Ephialtes spilocephalus, nobis, n. s.? *Noctua auribarbis* (?), Hodgson, mentioned in *J. A. S.* VI, 369: *Athene badia*, (?), Hodgson, enumerated in Mr. G. R. Gray's list of the Raptorial birds in the British Museum.

This little Owl is certainly an *Ephialtes* (vel *Scops*, Auct., though it appears this latter name was first appropriated to the Crowned Cranes), and probably a young bird, from the loose and floccose character of its plumage; but the aigrettes are not easily made out in the only specimen examined, though I believe that I have distinctly traced them. Its size is that of *Eph. lettia*, but the bill, feet, and talons, are considerably smaller. Length about nine inches, of wing six, and tail three and a quarter; bill, in greatest vertical depth, seven-sixteenths of an inch; feathered tarse an inch and one-eighth; length of middle toe and claw but an inch, the claws slender, delicate, and of a whitish hue; beak pale yellowish, or yellowish-white. The plumage of the head is very full and puffy, the feathers loose and light; each of them having two pale-coloured spots, set off with blackish, and the rest of the feather a dull light bay or tawney, a little pencilled: facial disk fulvescent. Upper-parts uniform dull tawney, pencilled with blackish; and the ordinary white spots occur on the outer scapularies: the primaries have also a series of three white bands on the unemarginated portion of their outer webs (the emargination being very slight): the secondaries and tertiaries are principally bay on their outer webs, with imperfect blackish bands; and the tail is barred with the same colours in about equal proportions, the central feathers having six tawney-rufous bands. Underparts paler than those above, minutely speckled with dusky, and with some larger whitish spots set off with blackish: lower tail-coverts white, a little barred, except the longest which are distinctly so; the tarsal plumes tawney-rufous, with dusky bars. From Darjeeling.*

Syrnium nivicolom, Hodgson, XIV, 185. Since describing this species, I have seen several fine specimens. One, from near Simla, presented by L. C. Stewart, Esq., now of H. M. 50th Ft., has the wing twelve inches and a half: colour dusky above, mottled with larger spots of fulvous-white than in that formerly described; but the under-parts are much the same. Two males and a female, the former with wing eleven inches,

* In the 'Madras Journal,' No. XXXI, 120, Mr. Jerdon describes a *Scops* (*Ephialtes*) *griseus*, which = *lettoides*, Jerdon, nobis, *J. A. S.* XIV, 182. Dr. Stewart has recently favored the Society with a specimen, from near Futtehpore, on the route from Allahabad to Cawnpore, which tends to indicate the specific identity of *Eph. lettia* and *Eph. lettoides*.

the latter twelve and three-quarters, from Darjeeling, are dusky, with the light mottlings much deeper fulvous, and there is a considerable admixture of pure white below the facial disk. Not improbably these were younger than the others.*

In XIV, 188, I suggested that *Buceros bicolor*, Eyton, is probably the *B. malabaricus* apud Raffles, and *B. albirostris* apud Horsfield; but I have since seen several specimens of a Malayan species intermediate to those two, combining the bill and casque of *B. albirostris* with the size and white outer tail-feathers of *B. pica* (vel *malabaricus*): this, Lord Arthur Hay considers to be *B. violaceus*, Wagler†; and the Society lately received a young bird of the species in question from Penang. The large head and casque referred to *B. albirostris* in XII, 995, I now consider to belong to the allied Penang species. The Society has lately received specimens of true *B. albirostris* from the Tenasserim province of Yé, undistinguishable from the bird of Bengal, Nepal, Assam, and Arracan: we had previously a Tenasserim specimen of the young of *B. albirostris*, presented on a former occasion by Mr. Barbe.

* The Norwegian collection has supplied us with three fine specimens of *S. aluco*, all of the non-rufous variety, and very different from the one we previously possessed. *S. nivicolus* is very nearly allied, and the under-parts of some specimens of the two species are undistinguishable: but the dusky ground-tint is much more predominant on the upper-parts of *S. nivicolus*, to an extent that the two could scarcely be confounded.

Here it may be remarked that the common *Ninox scutellatus*, which occurs in most collections from Malacca, has, in addition to its various other synonymes, been recently designated *Athene malaccensis* by Mr. Eyton, *An. and Mag. N. H.* 1845, p. 228: and in the same paper, — *Criniger gularis*, (Horsfield), is termed *Pycnonotus ruficaudatus*; — *Ixidia cyaniventris*, nobis, = *Malacopteron aureum*; — *Timalia pectoralis*, nobis, = *Malacopteron squamatum*; — *T. striata*, nobis, = *Brachypteryx maculatus*; — *T. erythronotus*, nobis, = *Br. nigrogularis*; — *T. erythroptera*, nobis, = *Br. acutirostris*; — *Muscipeta plumosa*, nobis, (of which it seems I described the female only,) = *Philentoma castaneum*, which must accordingly be altered to *Ph. plumosum*; — and a state of plumage of the bird I described as *Hemicercus concretus* (XI, 195,) is described by the name *Dendrocopos sordidus*. Mr. Eyton's *Ixos metallicus* would seem to be nearly allied, except in size, to the species which I designated *Brachypodius melanocephalus*, XI V, 176.

It is to be regretted that Capt. Charleton did not permit me to look over his collection of Malayan birds, when he had them in Calcutta; for all these useless synonymes would then have been avoided. I offered to have them labelled for him.

† Described by his lordship in the *Madras Journ.* No. XXXI, p. 148: and following this are descriptions of *B. comatus*, *B. malayanus*, and *B. Elliotti*, which last is *B. bicolor*, Eyton, apud nos, and, as I still think, rightly identified with the latter.

Hoopoes. This group is treated of in XIV, 189. I have now to add that the Tenasserim Hoopoe equals *Upupa epops* in size, but is considerably more rufous, and conspicuously so on the crest, which resembles that of *U. minor* of S. Africa: one specimen is also very rufous at the shoulder of the wing, and another moderately so; bill of each two inches and a half to forehead; and wing five and a half to five and three-quarters.

Halcyonidæ.—*Todiramphus varius*; *Halcyon varia*, Eyton, P. Z. S. 1839, p. 101. What I take to be the adult male, (and perhaps the adult of either sex,) of this species, is a beautiful bird, the colouring of which serves to connect *Todiramphus* (as exemplified by *T. collaris* and *T. sacer*;) with *Halcyon atricapillus* (v. *albiventer* of Scopoli, a name too inappropriate to be retained); but the beak is strictly that of *Todiramphus*. Length about nine inches, or nearly so; of wing four inches, and tail two and three-eighths; bill to forehead (in rather the larger of two specimens,) an inch and three-quarters; and the gape two and a quarter; tarse five-eighths of an inch. Cap green, rufescent on forehead, and margined posteriorly with verditer; a broad black stripe commences at the lores, and meets its opposite behind; above this is a slight rufous supercilium, and below it a broad rufous streak continued to the nape, and comprising the lower ear-coverts; below this again, is a very large rich purplish-blue moustache, commencing at the base of the lower mandible: the nape and breast are brilliant ferruginous, paling on the throat and belly, and the mantle, wings, and tail, are deep purplish-blue, each feather touched with ultramarine-blue on the wings, while the rump and upper tail-coverts are vivid verditer: bordering the ferruginous of the nape is a band of deep black. Bill dusky above, the rest apparently bright yellow; and legs probably coral-red. From Malacca.

In XIV, 190, I described a new Kingfisher from Darjeeling, by the name *Alcedo grandis*; which otherwise resembling *A. ispida*, is as much larger than that bird, as *A. bengalensis* is smaller: *A. ispida* is common in Afghanistan. Another closely allied species, which perhaps has not yet been distinguished from *A. bengalensis*, inhabits the Moluccas, and which I may provisionally call *A. moluccensis*: this differs from *A. bengalensis* in having a vertically much deeper bill, and from all its allied species in having the ear-coverts not rufous, but deep indigo-blue; the mottled feathers of the crown and neck, moustache, and wings, are also

more of a Prussian blue than in *A. grandis*, *ispida*, and *bengalensis*: wing three inches; depth of bill about three-eighths of an inch. Another closely allied species is the *A. meninting*, Horsf., v. *asiatica* of Swainson's Illustrations, which has the crown, neck, and wings, mottled indigo blue, scarcely any moustache, the back and upper tail-coverts ultramarine, and the breast and flanks deeper and richer ferruginous than in the others.—*A. biru*, Horsf., is another beautiful little Malayan Kingfisher, of a predominating light verditer-blue above and across the breast, but the marking of its under-parts allies it to certain African Kingfishers, as *A. semitorquatus*, and another which I have been unable to determine.

Bucconidæ (Barbets). There are three, if not four, species of Indian Barbets, having the general plumage of *B. caniceps*, Franklin, the distinctions of which may be advantageously pointed out.—1. *B. lineatus*, Vieillot, apud *Dict. Class.*; described to inhabit Sumatra. Length about ten inches, the wing five to five and a quarter. Upper-parts green, weaker on the flanks, and still paler and more yellowish on the vent and lower tail-coverts, spreading over the abdominal region in some: head, neck, throat, and breast, whitish, confined on the crown to an ill defined medial streak on each feather, the rest being dusky; on the nape, these streaks are contracted and better defined, often upon a green ground, and they gradually disappear on the back; throat spotless whitish; the sides of the neck and breast having each feather laterally margined with dusky-brown, the whitish however much predominating. Common in some parts of Bengal, and in Nepal, extending westward to the Deyrah Doon; also in Assam, Sylhet, Arracan, and the Tenasserim provinces, whence it probably extends into Sumatra.—2. *B. caniceps*, Franklin; *B. lineatus*, apud Tickell. Rather smaller, the wing measuring from four inches and a half to four and seven-eighths, though rarely exceeding four and three-quarters. The general plumage also similar; but the head, throat, and breast, much darker; the throat dusky-brown instead of whitish; and pectoral feathers with merely a narrow, ill defined, pale central streak, often scarcely present; lower breast paler: the back commonly more streaked with whitish than in *B. lineatus*: and, what constitutes a ready distinction of *B. caniceps*, the wing-coverts and tertiaries have each a terminal whitish speck, of which there is never the slightest trace in the other. This species inhabits the peninsula generally, and Upper India, meeting *B. lineatus* in the Doon; but

Australia

I have not seen it from Nepal, Bengal, or any of the eastern countries which are tenanted by *B. lineatus*.—3. *B. viridis*, Gmelin. Much smaller than the preceding: the crown spotless dusky-brown; mere traces of the lineation on the neck, and scarcely any on the breast; the throat and breast paler than in *B. caniceps*; and no whitish specks on the wings. Inhabits the Indian peninsula, and chiefly, I believe, to the southward.—4? *B. zeylanicus*, Gmelin, founded on the “Yellow-checked Barbet” of Brown’s Illustrations. This is described (but not figured) to have the “coverts of wings green, with small white spots in the middle of each feather:” hence, Mr. Jerdon has referred to it the *B. caniceps*; but as the figure is stated to be “more than two-thirds of the size of the living bird,” whereas it is but one-third of the linear dimensions of *B. caniceps*, and but half that of *B. viridis*, it probably represents a distinct species, approaching the last in size, and with the wing-specks of *B. caniceps*.

Of the other Indian Barbets, two are confined to the Himalaya, *B. grandis*, Gm., and *B. Franklinii*, nobis. *J. A. S.*, XI, 167. *B. indicus* (vel *philippensis*) is common throughout the country, also in the Tenasserim Provinces, and Sir Stamford Raffles includes it in his list of Sumatran birds; but I have never seen it from Arracan. *B. asiaticus* (the *Trogon asiaticus* of Latham and Gmelin), vel *cyanocollis*, Vieillot, and *cyanops*, Cuvier, abounds in the Sub-Himalayan region, in Nepal, Bengal, Assam, and Sylhet, but becomes comparatively rare in Arracan, and also in the Indian peninsula. *B. barbiculus*, Cuv., or a species which agrees sufficiently with the description of this in the *Dict. Class.*, inhabits Malabar; though *barbiculus* is said to be from the Moluccas. I add a description of an Indian specimen, sent on loan by Mr. Jerdon. Length five inches; of wing three and one-eighth; and tail an inch and three-eighths; bill to forehead five-eighths; and tarse three-quarters of an inch. General colour deep green; the forehead, around the eyes, and the throat, crimson, the last margined with yellow; occiput and cheeks pale blue. In Arracan, there is further the *B. australis*, Horsfield, v. *gularis*, Tem.; but the crimson of the cheeks, sincipita, and moustaches, seems invariably to be much less brilliant than in Malacca specimens.

Five species occur commonly in collections from Malacca, (besides the *Caloramphus Lathamii*, v. *Megalorhynchus spinosus* of Eyton, which is there common): viz. *B. chrysopogon*, Tem.;—*B. versicolor*, Raffles.;—*B. armil-*

not evidently
Gmelin.

laris, Tem.;—*B. quadricolor*, Eyton;—and *B. australis*, Horsf.:—a *B. trimaculatus*, Gray, is also mentioned by Mr. Eyton from the same locality; and without having a specimen of his *B. quadricolor*, *P. Z. S.* 1839, p. 105, for present comparison, I rather suspect its identity with *B. mysticophanes*, Tem., and with *B. Rafflesii*, Lesson, *Rev. Zool. de la Soc. Cuv.*, 1839, p. 139. The following description is from specimens in Lord A. Hay's collection. Length about nine inches; of wing three and three-quarters; and tail two and a quarter: bill to forehead an inch and three-eighths; and tarse an inch. Colour green, with an emerald margin to the feathers of the nape; forehead bright yellow; crown, throat, lores, and a spot on the side of the breast, crimson; beneath the eye, and middle of fore-neck, also crimson; sides of the crown, above and posterior to the bare ocular region, black; and a yellowish tinge towards the base of the lower mandible: emarginated portion of primaries edged with dull yellow; and tail bluish underneath: bill, legs, and the bristles at base of bill, black. A presumed female has the crown, lores, and spot at side of breast, crimson, but less defined than in the (presumed) male; throat mingled green and yellowish, passing to bluish on the fore-neck; forehead bluish, with yellow shafts to feathers, and some blue beneath the eye and at the base of the lower mandible; the latter is for the most part white. Length of wing, three inches and three-quarters.

Picidæ. Woodpeckers. Typical *Picus*, apud G. R. Gray: *Dendrocopus* of Swainson. I attempted a synopsis of the Indian species of this group, in XIV, 196 *et seq.*; since the publication of which, the Society has been favoured by the Natural History Society of Batavia with a very interesting collection from Java and the Moluccas, which has enabled me to compare various Indian species with their Malayan representatives. Among them is the little *Picus moluccensis*, which, though closely approaching to the Indian species referred to the same, yet exhibits some differences upon minute comparison. Both are certainly distinct from *P. canicapillus* of Arracan. As compared with the Indian species, that of Java has rather larger bill and feet; the crown is darker-coloured, passing to blackish, or deeply infuscated, on the occiput and median line of nape; the wings are shorter, measuring two inches and seven-eighths, while in the Indian species they are three and one sixteenth; and, lastly, there is a difference in the barring of the tail-feathers, and in the form of the tips of the more outer ones, which

in the Indian bird are more rounded, or somewhat truncated, with a slight emargination at the tip of the shaft, while in the Javanese bird they attenuate and are obtusely pointed; the white bars also assume more the appearance of transverse bands in the Javanese species, and of separated round spots in that of India; while the outermost feather is in the former tipped with white, and the penultimate has an all but terminal white bar, both these feathers in the Indian bird being broadly black-tipped, with a more interrupted white bar above. Should these differences prove constantly distinctive, Mr. Jerdon proposes the name *Hardwickii* for that of Southern India,* and which Dr. Stewart has recently obtained near Cawnpore, a vicinity in which it was also procured by Gen. Hardwicke.

With a few Australian birds, I lately purchased a Woodpecker, allied to *P. Macei*, which I have not been able to determine. There is no reason to suppose it inhabits Australia, where not a single Woodpecker has yet been discovered; and while the known Australian species in this small collection (including *Eudynamys australis*, Sw., quite distinct from the Indian Coël.) were brought as skins, the Woodpecker alone was mounted and wired. General aspect that of *P. Macei*; but with merely a faint tinge of red on the lower tail-coverts, and that of the crown is also much less developed, but slightly tipping the feathers, which elsewhere are black (there is an appearance, however, of the crimson having been much abraded on the crown of this particular specimen): all the tail-feathers are barred with white, the middle pair on each web alternately, and the rump is confusedly rayed with white and dusky black: breast spotted with linear streaks; and the flanks and belly marked with obscure transverse rays. Length nearly seven inches; of tail two and a quarter; (wings imperfect in the specimen;) bill to forehead (through the feathers) barely seven-eighths of an inch. If new, *P. pectoralis*, nobis. Hab. — ?

Sub-genus *Gecinus*. The *Picus affinis*, Raffles, is identified with *P. dimidiatus*, Tem., in the Zoological Appendix to Lady Raffles's 'Life of Sir St. Raffles, p. 668; and *Gecinus viridanus*, nobis, is certainly another synonyme of the same. This bird seems common throughout the eastern coast of the Bay of Bengal, as in Arracan and the Tenasserim

* *Madras Journal*, No. XXXI, 138.

provinces; in which latter range of territory *G. occipitalis*, (Vig.,) v. *barbatus*, (Gray,) undistinguishable from the Himalayan bird, appears likewise to be of plentiful occurrence.

G. chlorigaster, Jerdon, *Madr. Journ.* No. XXXI, 138: *Picus mentalis* apud Jerdon, *Catal.* Though closely allied to *G. chloropus*, Vieillot, v. *nipalensis*, Gray, with which I formerly identified it, this Woodpecker proves on comparison to be a distinct species. It is rather smaller than *G. chloropus*, and readily distinguishable by the crimson of its whole occiput, which is transversely separated from the dark green of the crown, and forms a pointed crest behind, which completely overhangs the silky yellow feathers of the nape: in *G. chloropus*, this yellow nuchal crest is much more developed, and the crimson is confined to the sides of the occiput, the central portion being green continued from the forehead, and the partly red and partly green occipital crest is not prolonged to the length of the yellow feathers beneath it. *G. chloropus* has the colours generally brighter and more contrasted than *G. chlorigaster*: the dusky green of the neck and breast contrasts with the brighter green of the upper-parts; there is a greater admixture of white about the throat and ear-coverts, which last are uniform dark green in *G. chlorigaster*; and the loreal feathers are conspicuously white, with a black streak above, this white being scarcely observable in *G. chlorigaster*: the mottling of the flanks is also of a different pattern. Length of wing four inches and three-quarters; in *P. chloropus*, five inches to five and a quarter. Inhabits Southern India.

In XIV, 193, I distinguished three species of the three-toed Woodpeckers forming the division *Tiga* of Kaup; and in a note to p. 551, I mentioned the existence of a splendid fourth species from Malacca. The latter proves to be the *P. Rafflesii*, Vigors, of the 'Appendix to Sir St. Raffles's Life' by Lady Raffles, p. 669. I took the following description of a female, in the collection of Captain Thomas, of the 39th Regt. B. N. I. Length a foot; of wing five inches and three-quarters, and of middle tail-feathers four and three-quarters: bill to gape an inch and five-eighths. Colour dull uniform golden-green above; the crown, much lengthened occipital feathers, primaries and their coverts, and tail, dusky black, with whitish tips to the primaries; forehead ruddy orange; throat and moustaches, pale yellowish-buff; and lower parts of a dingy, ruddy, somewhat dusky, greenish-brown, with some transverse whitish spots

on the flanks; ear-coverts blackish, bordered above and below with a white streak, and bounded posteriorly by a white patch; and below the inferior white line and patch is another broad streak of black. Bill dusky-greenish towards base of lower mandible; and the legs appear to have been green. The male (describing from memory, assisted by the latin definition cited,) resembles the female, except in having the whole crown and the much lengthened occipital feathers, very brilliant crimson.* This beautiful species obviously connects the subdivision *Tiga* (v. *Chrysonotus*, Swainson,) with *Gecinus* (v. *Chrysoptilus*, Sw.): indeed, were it not for the absence of the fourth toe, I should scarcely have hesitated in referring it to *Gecinus*, regarding it, however, as a link between that division on the one hand, and *Brachypternus* and *Tiga*, on the other. In the Appendix to Lady Raffles' work cited, *P. Rafflesii* is stated to be of the size of *P. tiga*; which latter (as here referred to) I believe to be my *T. intermedia*, which is common in the Tenasserim Provinces, and that it is the Sumatran *P. tiga* of Raffles; while the Malacca species is of the same small size as that of Java, lately received by the Society, (the females of which have the head differently spotted from those of *T. intermedia*,) and to which I have appropriated the name *Tiga tridactyla*.†

With regard to the species of *Brachypternus*, (p. 550 and note), Mr. Jerdon informs me that the common species of Southern India is identical with true *Aurantius* (v. *bengalensis*), of which I sent specimens for comparison; and the same gentleman has favoured the Society with an example of his *P. (Micropternus) badius* of Southern India, which Lord A. Hay considered (p. 551) to be distinct from both its Bengal and Malayan representatives: it is, indeed, intermediate to the other two, both in size and colouring; and combines the infuscated crown of *M. phaeiceps* with the dark throat of *M. badius* (verus), its tail-bars being also closer than in the others, amounting to six in number on the middle feathers, additional to the dusky tips, whereas the other species have only five. Mr. Jerdon designates it *M. gularis*.‡ The range of *M. phaeiceps* ex-

* Correct; and the colours also generally somewhat brighter.

† In the same Appendix, I find described a *Phaenicophaus caniceps*, which is the young of *Rhinorhiza chlorophæa*;—*Dicaeum croceiventre*=*D. trigonostigma*, (Scopoli), v. *cantillans*; *Chloropsis zosterops*=*Phyllornis Sonneratii*, fœm.;—and *Vinago giganteus*, which there can be little doubt refers to *Treron Capellei*.

‡ *Madr. Jour.* No. XXXI, 191.

tends southward to the Tenasserim Provinces, and one female from thence has the wing fully five inches long; that of *M. gularis* measures four inches and three-quarters.*

Cuculidæ. The oriental species of true *Cuculus* are still far from being definitively understood. First, there is the deep-coloured bird, otherwise resembling *C. fugax* of India, described as *C. nasicolor*, Hodgson, in XII, 943, but which I renounced as a species in XIV, 204. A Malacca specimen in Lord A. Hay's collection, however, renders this again doubtful, and it will perhaps prove to be the veritable *C. fugax* of the Malay countries.† Then, I suspect that I have confounded three species under *C. micropterus*, Gould: viz.—1, *C. saturatus*, Hodgson, (XII, 942,) the supposed old birds, with upper-parts "uniform pure dark ashy," mentioned in my description of *C. micropterus*, in XI, 903; and these seem also to have the under-parts more closely barred than in true *C. micropterus*, and are altogether more complete miniatures of *C. canorus*, having the dimensions of *C. micropterus*. It inhabits the Himalaya. (This must be regarded as a doubtful species, however, as yet.)—2, *C. micropterus* verus, with a larger bill than in *C. canorus*, the under-parts more distantly barred, the upper-parts of a bronzed ash-brown, and not pure dark ashy, the irides pale dusky, and the orbits and feet light wax-yellow: the *Bokuttácko* of the natives. Inhabits India generally, but is more numerous in the hills.—3, *C. affinis*, A. Hay. Decidedly a good species, resembling *C. canorus* in size, and *C. micropterus* in form and colouring; length of wing eight inches and a half, or an inch more than in *C. micropterus*. Common in Malacca, and not improbably the Javanese variety of *C. canorus* of Dr. Horsfield's list. In addition to these, we have *C. sparverioides*, of the same minimum group as *C. fugax* and *C. nasicolor*; and also *C. canorus*, and the little *C. poliocephalus* (*v. himalayanus*, Vigors), pertaining to the same minimum group as the other species mentioned. I kept for about a year a pair of *C. canorus* (*indicus*), for a long while in the same cage: upon separating them, the

* *P. ceylonus*, Forst., (*v. P. neglectus*, Wagler,) is a species obtained in Ceylon by Lord A. Hay.

† Since writing the above, I have seen Mr. Jerdon's statement to the same effect, *Madr. Jour.* No. XXXI, 140. Mr. J. thinks that the common Indian species should be termed *C. Lathamii*, Gray. I may add that his specimen of *C. Sonneratii* which he refers to, is perfectly identical in species with others from Malacca.

male soon began to utter his cry, *cuckoo*, generally of a morning and evening, ten or twenty times successively. The note was certainly harsher and less musical than that of the English bird, whether heard near or at a distance. It is very desirable that observers who have the opportunity, should strive to elucidate this very difficult little group of Cuckoos: it is probable that attention to their notes would essentially assist the study of them; and to naturalists located in the hilly parts of the country, we must chiefly look for conclusive information on the subject.

Simotes, nobis, n. g. Nearly allied to restricted *Cuculus*, but differing in the great breadth and depression of the beak, which considerably resembles that of *Casmarhynchus*, Tem., in general outline, being however flatter, especially underneath, where the rami are united for their terminal half or more, measuring from the gape; the nostrils being also formed as in other *Cuculi*; and the tip of the upper mandible entire, or unemarginated. Rest as in ordinary Cuckoos.

S. albivertex, nobis. Glossy black, with a broad white vertical medial band from the forehead to the occiput. Some white feathers also on the throat; and slight whitish tips to the outer tail-feathers. In immature plumage, the black is less intense, and the feathers are looser in texture; but there are no cross-bars. Bill black, paler below; and the interior of the mouth wholly yellow: legs dark brown, the tarsi half-feathered externally. Length about fourteen inches; of wing six and a half, or seven inches; and tail the same: bill to gape an inch and three-eighths, and half an inch broad at the nostrils: tarse seven-eighths of an inch. From Borneo (I have reason to believe); being sent with other birds from that island by Mr. Jerdon.

Taccocua affinis, nobis. Three species of this division are distinguished in Vol. XIV, p. 200; and subsequent observation has confirmed the propriety of the separation: but I find that the Sirkeer of the Rajmahl and Monghyr hills requires further to be distinguished from that of the Cawnpore district, higher up the Ganges in the WNW. direction. Dr. Stewart has favoured the Society with a Rajmahl specimen, which he justly remarks can be reconciled with neither of my descriptions. It combines the size of *T. sirkee* with the colouring of *T. infuscata*; but has the bill rather more abruptly curved over than in either, and coloured as in all its congeners. Wing six

inches ; middle tail-feathers nine inches ; and tarse an inch and a half. The deeper shade of colour of this bird distinguishes it from *T. sirkee*, to which it approximates most nearly, as also the decided brownish hue, concolourous with the back, of its tibial plumes, which in the other are highly rufescent ; and a further marked distinction from *T. sirkee* consists in the hue of the pectoral region, which has no rufescent tinge in the specimen before me of *T. affinis*, while in *T. sirkee*, the ferruginous tinge of the abdomen suffuses the breast and throat, passing insensibly, with no decided line of demarcation. The abdominal plumage of this bird is of a less dark tinge than in *T. infuscata* ; but the general colouring is much the same as in that species, from which the more slender legs and vertically deeper and more abruptly curved bill help to distinguish it. A further description is quite needless.

Centropus bicolor, Lesson ; *C. celebensis*, probably of Temminck. A description of this species will be acceptable to British students of ornithology. Length of wing seven inches, of middle tail-feathers a foot, the outermost shorter by one-half ; bill large, measuring to gape an inch and three-quarters in a straight line ; long hind-claw seven-eighths of an inch. Colour of wings and tail, a peculiar dull vinous-ruddy, nearly the same on the flanks, vent, and lower tail-coverts, and with a ferruginous tinge on the rump and upper tail-coverts : head, neck, throat, and breast, dull isabelline, paler towards the throat, and browner on the crown and back ; wing-coverts tinged with the same brown ; and all passing backwards into the vinaceous hue of the great alars and tail. Bill blackish, with horny-white tip : legs apparently plumbeous. Plumage not very spinous, its general character and colouring being much that of the Sirkeers (*Tucocua*). Inhabits the Celebes and the Moluccas.

Caprimulgidæ. The Indian and Malayan species of true *Caprimulgus* resolve into three different subgroups, each characterized by a particular style of marking : viz.—1, the *C. macrourus* group, comprising *C. albo-notatus*, *C. macrourus*, *C. mahrattensis*, and *C. asiaticus*, which last differs from the three others in having unfeathered tarsi ; these have the two outer tail-feathers on each side broadly tipped with white, which in the females is sullied, more or less reduced in quantity, and sometimes altogether wanting :—2, the *C. indicus* group, with a terminal or subterminal white spot on all but the middle pair of tail-feathers, rarely seen, and the white then much reduced in quantity, in the females ;—probably

three species, at present not well determined (vide XIV, 208*);—3, the *C. monticolus* group, of which the males have their two outer tail-feathers wholly white to near the tips: also apparently three species,—*C. monticolus*,—another allied to this in Scinde,—and *C. affinis*, Horsf., of the Malay countries, which last merely differs from *C. monticolus* in its smaller size, and the greater admixture of black on the upper-parts, more especially upon the crown. Length of wing six inches and a half,—that of *C. monticolus* being an inch more,—and the rest in proportion. The Scindian species (?) is figured in one of Sir A. Burnes' drawings, as mentioned in Vol. XIV, note to p. 547. It would appear to be still more uniformly coloured in the drawing than *C. monticolus*, of a light fulvescent-grey or sandy hue, with dark pencillings, but no scapulary pale streak nor white mark crossing the breast; tail closed, but its middle feathers (which alone are seen in the drawing) have narrower cross lines than in *C. monticolus*; the lower parts are represented somewhat paler than the upper, as is also the inner anterior margin of the wing (towards the body). Length of wing six inches and a quarter (not "nine inches and a quarter," as formerly misprinted). Should this be verified as a distinct species, it might bear the name *C. arenarius*, in allusion to the sandy soil which its colour would certainly denote that it frequented, and which is a very prevalent hue of the birds and other animals from Scinde, as M. Temminck has remarked of those from Egypt.†

Cypselidæ. *Macropteryx coronatus*; *Hirundo coronata*, Tickell, *J. A. S.* II, 580. This has hitherto been undistinguished from *M. klecho* (Horsf.) v. *longipennis*, (Tem.), of the Malay countries, which in India is represented by the present species. The two are, however, obviously

* The true *C. indicus* extends its range to Malacca. It is not rare in the Calcutta Botanic Garden.—*C. monticolus* I lately observed in a patch of open jungle, surrounded by cultivated fields.—*C. pulcher*, A. Hay, *Madr. Journ.* No. XXXI, p. 161, = *Lyncornis Temminckii*, Gould. The Society has specimens of this bird from Malacca and Java.

† The Norwegian collection before referred to, contains a female of *C. europæus*; and the resemblance of this to some specimens of *C. indicus* is extremely close: but the latter may always be distinguished by having the tarsi wholly feathered; by the abdominal region being much less rayed; and the males by having a white spot on four of the primaries, and upon the four outer tail-feathers on each side. The Society has also a Tenasserim specimen of undoubted *C. macrourus*, which very much resembles both *C. indicus* and *C. europæus*; but may be distinguished from the latter by having the tarse wholly feathered, and by the white basal portion of its rictal bristles.

distinct upon comparison of specimens. *M. coronatus* has the tail much more deeply forked, and its outermost feathers are much more attenuated, being commonly prolonged two inches beyond the extremities of the next pair, and an inch and a half beyond the tips of the wings; whereas in *M. klecho*, the tail does not reach to the tips of the wings, and both alars and caudals are considerably broader than in the Indian species. The colour of the upper-parts is also much greyer in the latter, with but a faint tinge of green, instead of being brightly glossed with green; and the chin and sides of the throat of the male, besides the ear-coverts, are ferruginous. Colour greyish above, darker in the male, and glossed with purplish-green; the tertiaries more or less pale, but never albescent-grey as in *M. klecho*: lower-parts ashy, with a slight green gloss, and passing to white on the belly and lower tail-coverts. Crest as in the other species, and structure in all respects typical. Length eight inches, by thirteen in alar expanse; of wing six and a quarter; and of outermost tail-feather five and a quarter. Common in Central and Southern India, and most probably the only species met with in the country.

We have accordingly now four species of this beautiful genus, which appears to be peculiar to India and the Malay countries:—viz. *M. coronatus*,—*M. klecho*,—the very beautiful *M. comatus*, (Tem.,)—and *M. mystaceus*, (Lesson,) of which last I have seen neither figure nor description: the three others are in the Society's Museum.

Collocalia, G. R. Gray. Several specimens from the Nicobar Islands differ a little from *C. fuciphaga* of Java, in having more white underneath, the crown and back darker and tinged with blue more than green, and the wing somewhat longer, and straighter or less sickle-shaped. These characters obtain, both in the old and young; but separation of them seems hardly justifiable. In specimens recent, or preserved in spirit, the outer toe is as opposable as in other Swifts.*

* Since the first portion of the present paper was printed off, the Society has been favoured by Capt. Lewis with numerous specimens, of various classes, collected in the Nicobars, and comprising several interesting novelties. In the class of birds, the most remarkable discovery is that of a species of *Megapodius*, having the same extraordinary habits as Mr. Gould's *M. tumulus* of Australia: there is also a new *Macropygia*, more nearly resembling *M. phasianella* of Australia, than *M. amboinensis* of Java and the Moluccas; specimens of a new *Treron*, previously however brought from thence; also of a new Heron, which likewise inhabits Arracan; and some *Insessores* which I shall describe in their respective places in the present paper: but the following species can only be introduced here, instead of in p. 11, *passim*.

Corvidæ. The Indian true *Corvi*, though so particularly numerous in individuals, are referable to but three species (that I know of), and of these the Raven (*C. corax*, Lin.) is confined to the north-western Himalaya and its vicinity, being unknown at Darjeeling, and equally so

Todiramphus occipitalis nobis. Nearly allied to *T. collaris* and *T. sacer*, but especially distinguished by its strongly marked rufescent supercilia, which are continued quite round the occiput, forming a narrow band; beneath this is a broader black band, continued from the ear-coverts; and then a still broader fulvescent-white collar, as in the allied species: immediately bordering the last, the back is more infuscated than in the other, and the crown is likewise very dark, with some rufous lateral edges to the frontal feathers: under-parts white, a little tinged with fulvescent, but less so than in *T. sacer*; and the back, wings, and tail, are much, as in *T. collaris*: bill black above, and the tip of the lower mandible; the rest of the latter white: legs brownish. Length of wing four inches and a quarter; tail three inches; and bill to gape two and a quarter. Young rather smaller, with dusky margins to the pectoral feathers; and the beak shorter, with a white and hooked extreme tip. It may be remarked that in *T. collaris* and *T. sacer*, there is a much less developed white occipital band concealed beneath the surface of the feathers, but which shews conspicuously when the coronal plumes are a little raised.

The following two species of *Palæornis* appear also to be quite new.

P. caniceps, nobis. This is a very strongly marked species; but I can now merely indicate rather than describe it, as but one specimen was obtained (alive, from a native), which had lost its tail, and the wing-primaries were also mutilated. The size approaches that of *P. Alexandri*, which at once distinguishes it from all other known species of the group. General colour vivid yellowish-green, with the winglet and base of the secondaries indigo-blue, and the medial portion of the secondaries inclining to emerald-green; primaries black, the longest of them tinged with indigo towards their base: cap grey; a broad frontal band continued to the eyes, (this mark corresponding with that of *P. pondicerianus*, but very much broader,) and likewise a broad black moustache, with some black feathers also on the throat: above this moustache, between it and the frontal band, the feathers are of the same grey as those of the crown. The beak has the upper mandible coral-red, with a white tip; and the lower mandible black: the form of the bill is both narrower and less deep than in *P. Alexandri*, and angulates above towards the base.

P. erythrogenys, nobis. Allied to *P. malaccensis*; but readily distinguished by the blossom-red hue of the cheeks not being continued round the nape, and by its larger size, and differently shaped tail. Length of wing seven inches and a quarter, and of tail ten inches; the middle pair of tail-feathers exceeding the next by three inches and three-quarters. General colour bright-green, more yellowish below, and tinged in the male with hoary greyish-blue on the nape and back; winglet and primaries blue, the latter margined and broadly tipped with green; middle tail-feathers also blue, margined with green for the basal half, and the rest of the tail-feathers chiefly or wholly green above, and all of them dull yellow below; the cap is not a distinct emerald-green, as in *P. malaccensis*, but uniformly coloured with the back (save where the latter is tinged with grey in the male); there is a well defined narrowish black streak from the nostril to the eye, and the same black moustache as in *P. malaccensis*; and the lores, cheeks, and ear-coverts, (only,) are blossom-red. Upper mandible coral-red, with a white tip; the lower one black. The female merely differs

throughout India generally.* The common Indian Black Crow (*C. culminatus*, Sykes,† is often erroneously termed ‘Raven’ by Europeans, and as often confounded with the European *C. corone*: it is eminently a “Carrion Crow” in its habits, and especially frequents the vicinity of the great rivers, being less confined than the next species to the immediate neighbourhood of human habitations. The common Indian Crow (*C. splendens*, Vieillot,) has sometimes been mistaken for the Jackdaw (*C. monedula*), and sometimes for the Hooded Crow (*C. cornix*), of Europe; as in the ‘Proceedings of the Zoological Society’ for 1839, p. 163, where the specification of the “Rook” and “Carrion Crow” both refer, as I believe, to *C. culminatus*, and the Raven is also there mentioned as an inhabitant of Assam (a statement which it would be satisfactory to have verified). *C. culminatus* is the Common Crow of Arracan; the *C. splendens* being only known in the northern part of that province, as about Akyab, (according to Capt. Phayre,)—and to the southward, upon the eastern side of the Bay of Bengal, I am told that it is the species of the Tenasserim Provinces. Proceeding further southward, a very distinct species of black Crow (*C. macrorhynchos*, Vieillot,) abounds towards the Straits of Malacca, which is probably the Sumatran *C. corax* apud Raffles; and the Javanese *C. enca*, (Horsf.), is distinct again, as I am informed. I have also been told that *C. macrorhynchos* is a much shyer bird than *C. culminatus*, with a very different *caw*; and the elongation of the beak, remarkable in *C. macrorhynchos*, would seem to be still further carried out in *C. enca*, insomuch that the latter species was ranged by Dr. Horsfield as a Chough (*Fregilus*). Professor Temminck states that the European Raven, Carrion Crow, Hooded Crow, and

in having the crown, nape, and back, quite uniform green, without the hoary-blue tinge conspicuous in the male; and the upper mandible is more or less black, like the lower one.

In *P. pondicerianus*, the upper mandible of the female is usually black, but often more or less mingled with red; that of the male being always bright coral-red: and the same is probably the case with both the foregoing new species, as well as with *P. malaccensis*. The young female of *P. pondicerianus* has recently been described by Mr. Fraser, by the name *P. modestus*. This latter species is common in Bengal, Assam, and along the eastern side of the Bay to the Malay countries generally; but is very doubtful as an inhabitant of Pondicherry, or any other part of the Indian Peninsula.

* It is common at Ferozepore, at least during the cold season.

† In the *Dict. Class. d’ Hist. Nat.*, this bird is erroneously referred to *C. major* of Levaillant.

Rook, occur in Japan* ; but Mr. Gould has distinguished the so called "Rook" of *Chusan* by the name *C. pastinator* (*P. Z. S.* 1845, p. 1); and another species inhabiting China and Chinese Tartary, is the *C. dauricus*, Pallas, which should be looked for by our trans-Himalayan travellers. Mr. Gould has also recently distinguished the common Australian black Crow by the name *C. coronoides*.

The Red-legged Chough (*Fregilus graculus*,) and Alpine Chocard (*Pyrrhocorax alpinus*,) are both well known tenants of the bare Himalayan crags, and appear to be identical in species with their European brethren. Captain Hutton mentions the former as a winter visitant in Afghanistan; and also that the Raven (*Corvus corax*,) and the Rook (*C. frugilegus*,) occur in that country, the former in summer, the latter in winter.†

Of the Nutcrackers (*Nucifraga*,) but three species have been ascertained; *N. hemispila* of the Himalaya, *N. caryocatactes* of Europe, and *N. columbianus* of North America (the *Corvus columbianus*, Wilson, first properly classified by the Prince of Canino). These birds are peculiar to the pine-forests, and the Himalayan species appears to be particularly abundant.

Magpies. *Pica*, Ray. The only species of true black and white Magpie proper to Indian Zoology, is the *P. bottanensis*, Ad. Deless., v. *megaloptera*, nobis, *J. A. S.*, XI, 193. It is remarkable for its great size, very large wings, and tail of moderate length. Inhabits the more eastern Himalaya.

The other species of this genus, which I at present know of, are as follow:—

2. *P. media*, nobis, *J. A. S.*, XIII, 393. The next in point of size. From the Chilian Andes.

3. *P. caudata*, Ray. The common European Magpie. This appears

* Some of the Japanese birds referred by M. Temminck to European species, are certainly quite distinct; *e. g.*, the Jay, which differs from *Garrulus glandarius* in having the space between the eye and moustache filled up with black (I think the same as in the Syrian Jay, *G. atricapillus*, Geoff., which has additionally a black cap); also the Japanese Robin, which has a rufous tail; and the Bullfinch, of which the male has a pale abdomen and lower breast, and both sexes are without the red mark on the outer margin of the smallest tertiary, which is constant in the European species, and in *P. nipalensis* becomes deep shining crimson; the female is also of a different shade of colour from that of its European congener.

† *Calcutta Journ. Nat. Hist.* 1, 558.

to be the species of Afghanistan, though I have never had the opportunity of comparing an Afghan with an European specimen. One I examined some time ago, from that country, had the wing seven inches and three-quarters long; tail eleven inches; bill to frontal feathers an inch and a quarter; and tarse an inch and three-quarters. Mr. Yarrell gives the wing of the English bird as seven inches and a quarter, and Mr. Jenyns as seven inches and eight lines: that of a British specimen in the Society's Museum (probably a female,) has it but seven inches. I fully believe that the Afghan Magpie is identical with the British species.* It has also been generally considered identical with that of China and Japan, and with the ordinary species of Western North America. Mr. Gould, however, has recently described the Chinese Magpie as distinct; but it would seem that the European is one of three species inhabiting the North American continent, all different from *P. media* of South America. For the identity of the North American species found westward of the Rocky Mountains, with that of Europe, we have the authority of Mr. Swainson; though he also regards the Chinese Magpie as the same: remarking—"We have been able to compare English and Arctic [American] specimens, with one from the interior of China, and we cannot perceive the slightest difference whatever to build even the character of a variety, much less of a species. The tails of the Arctic specimens are very beautiful." *Fauna Americana-borealis*, II, 292. Perhaps, therefore, there may be two species of Magpie in China, one of them identical with that of Europe.

4. *P. sericea*, Gould, *Proc. Zool. Soc.* 1845, p. 2. From Amoy. "Closely allied to the common Magpie, but differs in the wings, being blue instead of green, in the rather less extent of the white, and in having a longer bill and much longer tarsus; the latter measuring two inches and a quarter."

5. *P. hudsonia*, (Sabine), 'Appendix' to the Narrative of Franklin's first Polar Expedition, p. 671. The Magpie of Hudson's Bay. "Of less size in all its parts than the European Magpie, except in its tail, which exceeds that of its congener in length; but the most remarkable and obvious difference consists in a loose tuft of greyish and white feathers on the back: * * * tail from eleven and a half to twelve inches long."

* A Norwegian specimen just arrived, has the wing fully eight inches, and the rest as in the Afghan specimen above noticed.

Most of the Magpies have more or less greyish over the rump, and the absence of this is one distinguishing character of *F. bottanensis*.

6. *P. Nuttalli*, Audubon, 'Ornithological Biography.' This species is at once known by its yellow bill. From Western North America.

7. *P.*———? The small species noticed in *J. A. S.* XIII, 393, which is considerably inferior in size to the European Magpie, and has the tail glossed as in *P. Nuttalli*. I certainly do not think that it could have been *P. hudsonia*, and am unaware of its habitat. The only specimen I have seen was an unmounted skin in the collection of the Zoological Society.

Psilorhinus, Ruppell. The Blue Magpies. Mr. G. R. Gray, in his recent enumeration of the species of this group, gives only four; three of these being American, and the fourth Asiatic. I find, however, that several nearly allied Asiatic species, as many as five apparently, require to be discriminated.

1. *Ps. sinensis*; *Cuculus sinensis*, Lin., founded on the *San-hia* of Buffon: *Corvus erythrorhynchos*, Latham, founded on *le Geai de la Chine à bec rouge* of Buffon; also *Coracias melanocephala*, Latham. This Chinese bird, according to Levaillant's figure and description, has too much white upon its *crown* for the common Himalayan species, figured as *Pica erythrorhyncha* in Gould's 'Century'; and as the other oriental species of this group differ especially in this particular, and as Levaillant examined "at least six specimens" of his *Pie Bleue*, I think we may confide in his accuracy as regards the marking in question. He expressly states that the forehead, cheeks, throat, and the front and sides of the neck, are of a decided black; *the whole top of the head* is covered with bluish-grey feathers, which are long and broad, and form a kind of pendent crest: but he is doubtless wrong in correcting Buffon respecting the colouring of the beak, the original bright coral-red of which had faded in the specimens which he saw and drew from. *Baird.*

2. *Ps. occipitalis*, nobis: *Pica erythrorhyncha*, apud Vigors and Gould. Bill coral-red; a large oval white patch confined to the occiput, and pointed posteriorly, with terminal white spots on the hinder coronal feathers immediately impending it. The common species of Nepal and to the NW., as at Mussoorie, &c.

3. *Ps. magnirostris*, nobis. Resembles the last, but is still more richly coloured, especially on the wings; the bill much larger than in the

others; and a *great* naked space surrounding the eyes; the legs and claws also are large and strong. Length of bill to gape, an inch and three-quarters, that of *Ps. occipitalis* barely exceeding an inch and a half; and its depth and strength also considerably greater. Inhabits the Ya-ma-dong mountains, separating Arracan from Pegu.

4. *Ps. albicapillus*, nobis. This is evidently distinct, though I only know it in its immature garb, which differs from that of *Ps. occipitalis* in having the entire cap white; the extreme frontal feathers, and those impending the nostrils, being alone black. From the neighbourhood of Simla. The Chinese species would seem to be intermediate to this and *Ps. occipitalis*.*

5. *Ps. flavirostris*, nobis. General plumage of a *much* duller colour than in the others; the bill of the recent specimen bright yellow, instead of deep coral-red; and the white of the occiput reduced to a narrowish *transverse* band, with a broad collar of black below it, surrounding the hind-neck, and never any white tips to the feathers immediately above it; legs and toes small and slender. This is the most distinct from the rest of all the species here indicated; and it is the first which I distinguished from *Ps. occipitalis*, though I waited to obtain the young of the latter before attempting to describe it as a separate race. It is the common species of Darjeeling, and the only one I have seen from that locality; but I have now seen many specimens from thence, all true to their distinctive characters. Upon shewing the three Himalayan races to Mr. Hodgson, (*Ps. albicapillus*, *Ps. occipitalis*, and *Ps. flavirostris*,) that gentleman informed me that he had long ago distinguished them, and that he had exhibited coloured drawings of the heads of each at a meeting of the Zoological Society in London. It is probable that naturalists in Europe will not at once be prepared to accept the distinctions that have been here indicated, but I am content to await their future decree, when they shall have obtained the requisite data to judge from; as in the matter also of the Hoonuman Monkeys, (XIII, 470,) concerning which Mr. Gray, I perceive, regards as varieties merely of the same species, the very distinct

* Lord A. Hay writes me word, that he has recently obtained this white-capped species at Simla: it being the only specimen of the genus which his lordship did there meet with; though *Ps. occipitalis* abounds at Mussoorie, and as Capt. Hutton informs me, is very terrene in its habits, feeding almost entirely on the ground.

races which I still insist upon are different species, if any meaning is to be attached to the latter term. With sufficiently perfect specimens to form an opinion upon, I own I cannot conceive how any other conclusion can be arrived at, in the latter instance, than that upon which Mr. Elliot and myself are agreed.

Cissa, Boie : *Corapica*, Lesson : *Chlorisoma*, Swainson. Here, again, I think that three species require to be distinguished. 1, *Cissa sinensis*, (Gm.), founded on Buffon's plate, of which a copy has been obligingly sent me by Mr. Jerdon. This would seem to be distinguished from *C. venatorius*, (Gray,) of the Himalaya, Assam, Sylhet, and the Tenasserim Provinces, by having much less black behind the eye; and it would appear also to have the wing entirely blackish, except the tips of the tertiaries which are white: and as the upper-parts are represented more green than blue, the inference is, that the hue of Buffon's specimen had not faded.—2, *C. venatorius*, (Gray);—and 3, *C. thalassina*, (Tem.)—*C. venatorius*, when newly moulted, is of a lovely green, with the wings bright sanguine-red; and the bill and legs deep coral: but whether alive, (wild, or in confinement,) or mounted as a stuffed specimen and exposed to the light, the green soon changes to verdigris-blue, and the red of the wings to dull ashy: at this time of writing, a specimen in the Museum which was of the finest green and red when set up, has completely faded on the side exposed to a moderate light, and retained its pristine colours on the other side; and I am obliged to keep another specimen protected from the light, to shew the great beauty of the species in its unchanged *verdure*. I have had many of these birds alive, which combine in their manners the traits of the Jay and Shrike; they are very amusing birds, soon become tame and quite fearless, are very imitative, sing lustily a loud and screeching strain of their own, with much gesticulation, and are highly carnivorous in their appetite. The Shrike-like habit, in confinement, of placing a bit of food in each interval betwixt the bars of their prison, is in no species more strongly exemplified than in *Cissa venatorius*.

The genera *Psilorhinus* and *Cissa*, with *Cyanacorax* of South America, form a little group by themselves*; and I consider that Mr. Strickland was quite justified in separating from the last the blue Jays of

* *Corvus cyanus*, Pallas, exemplifies another form that should rank with them.

North America, which constitute his *Cyanocitta*, *An. and Mag. Nat. Hist.* 1845, p. 260; but as *Corvus cristatus*, Lin., is the type of Mr. Swainson's *Cyanurus*, I conceive that this must take precedence of *Cyanocitta*, Strickland.

Crypsirina, Vieillot: *Phrenotrix*, Horsfield: *Dendrocitta*, Gould. Some attempt was made at collating the Indian species of this group of Magpies, in XII, 932. I now add another species, and shall endeavour to assort the synonymes.

1. *Cr. rufa*; *Corvus rufus*, Scopoli, Lath., founded on *la Pie rousse de la Chine* of Sonnerat, badly figured by Levaillant: also *Coracias vagabunda*, Latham; and perhaps *Pica rufiventris*, Vieillot, Shaw's *Zoology*, XIV, 73. India generally.

2. *Cr. pallida*, nobis. Distinguished from the last by its considerably smaller size and paler colouring. Length about fifteen inches, of which the middle tail-feathers measure eight and three-quarters, the outermost four inches and five-eighths less; wing five inches and a half; bill to gape nearly an inch and a quarter; tarse an inch and one-eighth. Plumage as in *Cr. rufa*, but altogether much paler: the back and scapularies isabelline with a shade of dusky, but devoid of any decided rufous tinge; rump paler, the belly and lower tail-coverts pure isabelline, or buffy cream-colour. The hue of the lower-parts approaches that of the young of *Cr. rufa*; but the much firmer structure of the plumage, indicative of maturity, at once distinguishes it from the latter. Hab. Western Himalaya. This species, and the young of *Psilorhinus albicapillus*, were obtained in a small collection from that part, purchased in Calcutta by Prof. Behn, of Kiel University, who first called my attention to the distinctness of each of them from its near congener, and kindly permitted me to draw up descriptions for publication.*

3. *Cr. sinensis*.†—4. *Cr. leucogastra*.—5. *Cr. rufigastra* (*non vidi*), vide XII, 933.—And 6. the *Cr. altirostris* will, I suspect, prove to be the same as *Cr. frontalis*, from the description of which it deviates only in

* Both would seem to be rare. Capt. Hutton never met with *Ps. albicapillus*, during the long time that he has collected in the W. Himalaya; and Capt. Boys has only once obtained *Cr. pallida*, many years ago.

† Very doubtful as an inhabitant of Southern India. Jerdon.

having the *vertex* black like the forehead, not grey like the occiput.* Hab. Darjeeling, and the mountains of Assam. This last species has the beak compressed so as to resemble that of a *Callæas*, Forster (*v. Glaucoptis*, Gm.), to which genus M. Temminck has referred certain other *Crypsirinæ*, as also the *Temnorus leucopterus*, (Tem.), Lesson.

Of the two Himalayan species of *Garrulus*, or true Jay, Mr. G. R. Gray arranges the synonymes as follow:—1, *G. ornatus*, Gray, Hardwicke's *Ill. Ind. Zool.*; *G. bispecularis*, Vigors and Gould.—2, *G. gularis*, Gray, Hardw., *Ill. Ind. Zool.*; *G. lanceolatus*, Vigors and Gould; and *G. Vigorsii*, Gray, Hardw., *Ill. Ind. Zool.*—The *G. striatus*, Vigors and Gould, though extremely Jay-like in form, pertains to a different series of birds; and Mr. G. R. Gray ranges it under *Turnagra* of Lesson, which he considers synonymous with his own *Keropia*. *G. gularis* is the great Kemaon Shrike of M'Clelland's 'Geology, &c. of Kemaon,' p. 244.

After the *Corvidæ*, might be arranged the *Paradiseidæ*; to which family I suspect the curious Australian genera *Ptilinorhynchus* and *Chlamidera* should be referred. Then the great family of *Sturnidæ*, commencing with an Australian sub-family, which comprises the genera *Strepera*, *Gymnorhina*, *Cracticus*, *Vanga*, *Neomorpha*, and *Grallina*. Then the great series of Old World *Sturnidæ*, forming the sub-family *Sturninæ*; from which perhaps that of *Lamprotorninæ* might be separated, though it is not easy to trace the line of demarcation of this group. I described apart the two Indian *Graculæ* in XII, 178 (*bis*); but Lord Arthur Hay has since distinguished the Malayan Grackle from that of Bengal, &c., which necessitates a revision of the synonymes of all three species.

1. *Gr. religiosa*, Lin. (apud Lord A. Hay): *Gr. indica*, Cuvier; *Pastor musicus*, Tem.; *Mainatus javanus*, Lesson, apud Jerdon, *J. A. S.* XII. 178 (*bis*); *Lesser Mina* of Edwards, quoted by Latham and Gmelin as *Gr. religiosa*, L., var. *A.* (the *Greater Mina* of Edwards being quoted by them as var. *B.*). Inhabits Southern India.

2. *Gr. javanensis*, Osbeck: *Greater Mina* of Edwards; and no doubt *Sturnus indicus Bontii* of Ray and Willughby; probably also *Mainatus major*, Brisson. This, the common Malayan Grackle, differs

* Dr. McClelland's coloured drawing of *Cr. frontalis* accords with the description: having the forehead broadly black, passing laterally over each eye to beneath the vertex, as in *Cr. sinensis*, and leaving the vertex greyish-white, continuous with that of the occiput and nape; whereas in *Cr. altirostris*, the black anterior portion comprehends the vertex, as in *Cr. leucogastra*.

from that of Nepal, Bengal, Assam, Arracan, and the Tenasserim Provinces, (the common Hill Mynah of the Calcutta dealers,) in its rather larger size, as regards linear dimensions, but much more robust conformation, with much larger occipital lappets, &c. The closed beak measures eleven-sixteenths of an inch in vertical depth, whereas in the Bengal species it does not commonly attain to half an inch; the feet are also much thicker and stronger, with far more powerful toes and claws, the tarse measuring an inch and three-eighths, and middle toe and claw nearly one and seven-eighths; while in the Bengal species the former measurement is one and a quarter, or less, and the latter about one and five-eighths; wing respectively seven inches, and six and a half or less; and tail the same in both. All the specimens I have seen have been from Malacca*: of a number received from the Tenasserim Province of Yè, not one could be mistaken for this Malayan bird. Edwards' statement that his "Greater Minor, or Mina, for bigness, equals a Jackdaw or Magpie," is intelligible of the present species, but scarcely so of the next.

3. *Gr. intermedia*, A. Hay, probably the *Mainate* of Buffon, and perhaps *Mainatus sumatranus*, Lesson: *Gr. religiosa*, apud nos, *J. A. S. XII*, 178 (*bis*). The range of this species has already been indicated. It is always less robust, with a less powerful beak, and smaller occipital lappets, than in *Gr. javanensis*.†

Ampeliceps coronatus, nobis, *J. A. S. XI*, 194. In *XII*, 985, I indicated a grand defect in the specimen originally described, and noticed the near affinity of this genus to the preceding one. Our indefatigable contributor Mr. Barbe has now supplied us with fine specimens of both sexes, of which the beak essentially resembles that of *Gracula*, but is smaller and shorter, and of a dark greenish colour with yellowish tip and along the tomia (in the scarcely dry specimens). There is a tolerably large naked space surrounding the eye, which appears to have been yellow; but the orbits are black; and there are no short velvety feathers on the sinciput, or nude skin beneath and occipital lappets,

* It likewise inhabits the Nicobar Islands and Penang. In this species, the occipital lappets are generally united at base, but sometimes only approximated; in *Gr. intermedia* they are smaller and more distant apart.

† In the 'Madras Journal', No. XXXI, p. 154 *et seq.*, Lord A. Hay terms these three birds *Gr. religiosa*, *javana*, and *indica* (*nee intermedia*).

as in *Gracula*; though in other respects the form is barely separable. The presumed female differs from the male in having less yellow on the crown and throat: in the male, the whole crown, lores, throat, extending laterally to the naked skin beneath the eyes, are bright yellow; whereas in the females, the lores, and a considerable space both above and below the nude orbital skin, are black. The rest of the plumage is exactly as in the *Graculæ*, with yellow instead of white barring the primaries. Inhabits the Tenasserim Provinces. This is an exceedingly pretty Mynah, and I doubt not would be much esteemed as a cage favourite.

The other Mynahs were treated of in XIII, 361 *et seq.*: and the common arboreal Bengal species there referred, and also by authors generally, to *Acridotheres cristatellus*, (L.), of China, proves to be distinct, and apparently referable to *Pastor griseus*, Horsf., of Java, which that naturalist imagined to be the same as the *cristatellus*. To Lord Arthur Hay, I am indebted for the loan of a Chinese specimen of true *Acr. cristatellus*, the young of which I described as *Acr. fuliginosus* in XIII, 362. I now supply descriptions of each, which will suffice to shew their differences.

Acr. cristatellus, (Lin.); figured by Edwards, pl. XIX: *Acr. fuliginosus*, nobis (the young). Length about eleven inches: of wing five inches and a half; and tail three and three-eighths; bill to gape an inch and three-eighths; and tarsi an inch and a half. Colour throughout greyish-black, with a bronzed gloss on the upper parts; tail-feathers, except the middle pair, and the lower tail-coverts, tipped with white; base of the primaries, and greater portion of their coverts, also white, forming a broad band on the under surface of the wing; erect frontal feathers above three-quarters of an inch high, in the specimen under examination: the bill appears to have been yellow, with the base of the lower mandible carrot-red; and the legs are also yellow. The young is browner, with the white patch at the base of the primaries much more developed: but there is no white at the tip of the tail, or of its under-coverts; and the frontal crest is barely indicated.

Acr. griseus, (Horsfield): *Pastor cristalloides*, Hodgson. Smaller and paler, with the under-parts of a much lighter ash-colour, paling and in some specimens passing to vinaceous-white on the abdomen, and always to pure white on the lower tail-coverts: the tail-feathers are

much more deeply tipped with white than in *Acr. cristatellus*; there is a similar white wing-patch; and the frontal crest is commonly under half an inch in height. Terminal half of the bill orange-yellow, the remainder with the inside of the mouth deep black: legs orange-yellow: irides bright yellow. Length nine inches and a half, by fifteen inches; wing five inches; and tail three inches: bill to gape an inch and a quarter; and tarse one and three-eighths. The young are browner than those of *Acr. cristatellus*, and are at once distinguished by having the throat whitish, more or less pure, and the middle of the belly and lower tail-coverts white. This bird takes much the same range as *Gracula intermedia*, only that it is not confined like that species to the hill country: it is common along the eastern coast of the Bay of Bengal, to the Tenasserim Provinces at least; and it appears to be Dr. Horsfield's Javanese *Pastor griseus*.*

Also very closely allied to the latter, is the *Acr. fuscus* of the Indian Peninsula, which is distinguished from *Acr. griseus* by its smaller size, browner colouring, white abdominal region, and greyish-white irides. Wing four inches and three-quarters.

The *Acr. ginginianus*, one of the commonest birds in the vicinity of the great rivers of Upper India which have high banks, does not occur so low down the Hoogly as Calcutta, but abounds as soon as the banks of the Hoogly become of sufficient height for it to burrow in with tolerable security; and on ascending the river makes its appearance soon after the common Indian Bank Swallow (*Hirundo sinensis*, Gray). Mr. Hodgson well named this species *Pastor gregicolus*, for it constantly associates with the herds of cattle on open pastures; and populous communities of them perforate deep holes in the perpendicular banks of rivers, in which they repose and breed. This bird is the *Turdus suratensis*, var. A, of Latham; his *T. suratensis* being no other than *Pastor roseus*: it is also the *Gung-Salik* ('Ganges Mynah') of the Bengalees, and should be compared with the African *Martin gris-de-fer* of Levaillant, upon which is founded *Gracula grisea*, Daudin, and *Cossyphus griseus* of Dumeril.

Sturnia erythropygia, nobis, n. s. This beautiful species would seem to be nearly allied to the Javanese *St. tricolor*, (Horsfield), v. *melanoptera*,

* I think that I have seen it from Malacca, but am not quite sure. A gentleman from Java considered it to be, decidedly, the species common in that island.

(Wagler). Head, neck, and lower-parts, pure silky-white; the wings wholly shining black; the scapularies and interscapularies pale satiny-brown; the rump, vent, upper and lower tail-coverts, deep ferruginous; and the tail black, with more than half of its outermost feather ferruginous, and the rest successively less deeply tipped with ferruginous to the middle pair: bill yellow, with the base of the lower mandible livid blue; and legs (apparently) orpiment-yellow. Length approaching to nine inches; of wing four inches and a quarter to four and a half; and tail three and a quarter to three and a half; bill to gape nearly an inch and a quarter; and tarse an inch. From the Nicobar Islands.

To the same genus, *Sturnia* of Lesson, must be referred the *Pastor malayensis*, Eyton, *P. Z. S.* 1839, p. 103; but as an aberrant species, with the bill short, and approximating that of *Calornis*,—more slender, however, than in that genus, and having the outline of its upper mandible less curved. Length about seven inches and a quarter, of wing four and one-eighth, and tail two and a quarter; bill to gape seven-eighths, and tarse an inch. Head, neck, and under-parts, of a silky subdued whitish or drab-white; whiter on the belly and lower tail-coverts, and tinged with purplish on the crown and nape: an occipital spot, the interscapularies, proximate scapularies, shoulder of the wing, and rump, black with a rich purple shine; outer scapularies, and the second range of wing-coverts, subdued white; as also an elongated central terminal spot on some of the greater wing-coverts, and more or less developed on the tips of the tertiaries; rest of the wing, and the tail, glossy green-black, with some admixture of purple; the secondaries shaped at tip and margined with deep black, as in *Sturnus vulgaris*; the outermost tail-feather having a whitish-brown exterior web, and most of the upper tail-coverts are of the same dull pale brown colour: bill dusky, whitish towards base of lower mandible; and the legs apparently plumbeous. What appear to be the females have a large triangular drab-coloured spot at the base of the secondaries, and the exterior half of the outer webs of the primaries are of the same hue; a trace of this appears also on the wings of some (presumed) males. The young are brown above, paler beneath, passing to whitish on the belly and lower tail-coverts; the back and scapularies are darkest; and there is a blackish occipital spot in place of the shining black spot of the adult: the wings are marked nearly as in the adult, but are much less bright; the secondaries brown

with pale outer margin; and the bill pale, with dusky on its terminal half. Common at Malacca.*

Calornis affinis, A. Hay. This differs from the Malayan *C. cantor* in its larger size. Wing four inches to four and a quarter, instead of three and a half to three and five-eighths: and tail three inches to three and a quarter, instead of two inches and a half; tarse seven-eighths, instead of three-quarters of an inch; and bill about the same in both: plumage of the two species absolutely similar at all ages, and glossed as brightly in fine specimens of either. *C. affinis* inhabits Tipperah, Arracan, Tenasserim (?), and the Nicobar Islands: while *C. cantor* is common at Malacca.

Pastor temporalis, (Tem., noticed in Vol. XIII, note to p. 366.) proves to be from China, and will rank in *Sturnopastor*, Hodgson. Lord Arthur Hay has favoured the Society with a specimen from Hong Kong: and his lordship first called my attention to the distinction of size between *Calornis cantor* and *C. affinis*. Here, too, may be noticed that I no longer regard *Sturnus indicus*, Hodg., as distinct from *St. vulgaris*.

Fringillidæ, sub-fam. *Estreldinæ*. In Vol. XIII, 949, I endeavoured to give a list of the Indian Mooniahs, &c., which was partly corrected in XIV, 554. I now offer a revised list of them.

1. *A. malacca*, (Lin.): *Coccothraustes javensis*, Brisson: *White-breasted Indian Sparrow* of Edwards. Hab. Peninsular India.

2. *A. sinensis*: *Coccothraustes sinensis*, Brisson: *Loxia malacca*, var. *A*, Latham; *Munia rubronigra*, Hodgson; *Lonchura melanocephala*, Horsfield: *Chinese Sparrow* of Edwards. Bengal, Nepal, Assam, Arracan.

3. *A. maja*: *Loxia maja*, (nec *Fringilla maja*,) Lin.: *Loxia leucocephala*, Raffles. As a rare Bengal species, this rests on the authority of a most correct observer, Mr. Frith. It is common in the Malay countries.

4. *A. pectoralis*, Jerdon. South India.

5. *A. molucca*, (L.): *Munia acuticauda*, Hodgson. Nepal, Malacca.

6. *A. striata*, (L.): *Fringilla leuconota*, Tem. South India, Arracan. Such at least is the range of the Indian species, which Mr. Jerdon thinks is distinct from its Malayan representative: the latter I have not seen; but, if different, it will retain the name and synonyme here applied to the Indian bird.

* *Pastor chinensis*, (L.), as figured in the *Pl. Enl.*, to judge from a copy of that figure sent me by Mr. Jerdon, would seem to be an aberrant species of *Sturnia*, having some affinity for *St. sericea* and *St. malayensis*.

7. *A. undulata*, (Lath.): also *Loxia punctularia*, var. A, Lath.; *Munia lineoventer*, Hodgson. India generally. From the nearly allied Malayan species—*L. punctularia*, (L.), v. *nisoria*, (Tem.),—this Indian bird is distinguished by having its upper tail-coverts ochreous, and tail tinged with the same; whereas *A. punctularia* (vera) has the tail ashy, and its coverts barred dusky-ash and white. Mr. Jerdon first informed me of their distinctness.

8. *A. malabarica*, (L.): *Lonchura cheet*, Sykes; *Loxia bicolor*, Tickell (nec Latham). India generally; common in Bengal. *L. malabarica* apud Latham, is the young of *A. sinensis*; and his *L. bicolor* is evidently the immature plumage of some other species.

The *Estrelida formosa*, (Lath,) as I am informed by Capt. Wroughton, occurs in immense flocks in the high lands where the Nerbudda takes its rise.

Fringillidæ.* Several of the species described in my 'Synopsis of Indian *Fringillidæ*,' J. A. S. XIII, 944 *et seq.* (1844), have since been described by Mr. Hodgson in the 'Proceedings of the Zoological Society' for April, 1845. *Pyrrhuloides epauletta* is there termed *Pyrrhoptectes epauletta*. The generic name *Propyrrhula* is transferred to *Pyrrhospiza* of my synopsis, and *Pr. punicea* described as *Pr. rubeculoides*. *Carpodacus* (v. *Erythrospiza*, Bonap.) *erythrinus*, is designated *Pyrrholinota roseata*; and *C. rodochrous* and *C. rodopeplus* are styled *Propasser*.—I lately saw fine specimens of *Pyrrhospiza punicea* from the Boorendoo Pass; and with them a new species of restricted *Fringilla*, from Huttoo mountain, near Simla, in the collection of Capt. Thomas, 39th Regiment Bengal Native Infantry. *Pyrrhospiza* is but slightly removed from typical *Fringilla*, which group it connects with the various roseate Finches; and will most probably contain the *Fr. sanguinea* of Gould: and another nearly allied form is *Leucosticte*, Swainson, figured in the *Fauna Americana-borealis*, to which may seemingly be referred Mr. Hodgson's

* It may be remarked here that *Passer montanus* is the common Sparrow of Java, from which island it was long ago mentioned to have been received, in the *Dict. Class.* I had before traced it to Arracan and Malacca, and suggested its being the Siamese Sparrow of Crawford. It is common in China and Japan, also in the Himalaya, and in Afghanistan, extending westward to the British Islands.

Of the common Indian Sparrow (*P. indicus* of Jardine and Selby, and 'Black-breasted Finch' of Latham), I find that some males, especially in breeding aspect of plumage, are fully as rufous as represented, and the under-parts of both sexes are always whitish: but the size accords with that of the ordinary European Sparrow, to which it is so very closely allied.

Fringillauda; and his *Procarduelis* is also not far removed. A new species of *Leucosticte* has lately been figured by Mr. Gould, in the 'Zoology of the Voyage of the Sulphur,' by the hybrid name *griseogenys*, under which it is described in *P. Z. S.* 1843, p. 104. The new Finch may be thus described—

Fringilla erythrophrys, nobis. Length of male about seven inches; wing three and seven-eighths; and tail two and five-eighths; bill to gape above five-eighths, and tarse three-quarters of an inch. Female rather smaller. Colour of male ruddy-brown above, darkest on the tail-coverts; below dull buffy-red, mingled with weak crimson on the chin and throat, also on the forehead, and this red passing as a broad streak over the eye, and becoming deeper crimson posteriorly: fine specimens in summer dress have probably the whole under-parts, with the forehead and eye-streak, crimson, and the back deeply tinged with the same: the crown, ear-coverts, wings and tail, are black, not very deep, with the three outer tail-feathers chiefly white towards the tip, and with dark outer webs to near the end; and the other tail-feathers are white-tipped, except the middle pair: wings marked with white, the greater coverts of the primaries having their terminal half white, those of the secondaries broadly tipped with the same, as are also the outer webs of the tertiaries, and (successively more slightly) those of the secondaries and primaries. Bill yellow, and legs light-coloured. The female is plain brown, paler and tinged with yellowish below, darker and a little tinged with yellowish on the crown, and having a bright saffron eye-streak, and duller saffron-coloured or ochreous forehead; the wings and tail are marked as in the male, but the white is less developed; and the back is yellowish-brown. This is a true restricted *Fringilla*, of the form of *Fr. montifringilla*, &c.; but having obvious affinities for the red Finches (*Carpodacus*, &c.), and shewing also a marked relationship for *Coccothraustes*, and even for *Carduelis*.*

* Lord A. Hay informs me of what he suspects to be a new Finch, and terms *Fringilla rubrifrons*, procured during his sojourn at Simla. "Size very small; and colour olive-green, striate and mingled with dirty yellow: forehead red." The particular subdivision of Finches is not stated.

There is also a very curious-looking, diminutive, Finch-like species, figured among Dr. McClelland's drawings of Assamese birds. The size and plumage are very *Wren*-like; with a bill approaching in form that of a *Chaffinch*: colouring deep isabelline or buff, with dusky rays on the wings and tail, and the primaries edged with white. The immediate affinities are by no means obvious.

Emberiza cia, Lin. (mentioned in Royle's list): *E. barbata*, Scopoli; *E. lotharingica*, Gm. Length six inches and a half: of wing three inches; and tail two and three-quarters. Upper-parts rufescent-brown, brighter on the tail-coverts, and marked, except on the latter, with a black central streak to each feather: crown dusky, with some inconspicuous rufous edges to the feathers, a pale medial coronal line, and a broad whitish supercilium; a black line passes beneath the latter through the eye, and partly surrounds the pale ear-coverts, and another black streak proceeds downward from the base of the lower mandible; the chin, throat, and breast, are dingy grey, with slight dusky spots in front of the neck; and the rest of the lower-parts are uniform light ruddy-brown, with traces of dark streaks on the flanks: wings dusky, the feathers margined with the rufescent-brown of the back; and the two outermost tail-feathers on each side are chiefly white, except on their narrow outer webs. Bill pale plumbeous, and legs light-coloured. Also procured in the vicinity of Simla by Capt. Thomas, who has obligingly presented it to the Society.* According to Messrs. Dickson and Ross, this bird is common in the vicinity of Erzeroum, being found near mill-streams, and in burying grounds. *P. Z. S.* 1839, p. 132.

Mr. Hodgson, in *Proc. Zool. Soc.* 1845, p. 35, states that, in Nepal,—“We have four species of *Emberiza*, three of which are the *erythroptera*, *chlorocephala*, and *aureola*, of authors; and the fourth,” he adds, “is, I think, new,—*Emberiza oinops*, mihi,—a new subgenus, *Ocyris*, mihi.” Of these four, the first now bears the name *Lathamii*, Gray†; the second is, beyond doubt, my *melanops*, *J. A. S.* XIV, 554, which was recognized by Mr. Hodgson when in Calcutta, as a species familiar to him, and it is quite distinct from *E. hortulana* (v. *chlorocephala*), of Europe‡;

* I have since been informed that it is there common. Lord A. Hay procured many specimens; and mentions also another species “closely allied to it, but differing in having a large liver-brown spot on the cheek, and in some other particulars.” The liver-brown spot in question is possessed by *E. fucata* and by *E. pusilla* (?).

† Lord A. Hay possesses this bird from Hong Kong; and Mr. Jerdon considers it to be the *Moineau de Macao* of Buffon, “and if so it will bear the prior, but certainly inappropriate, name of *melanictera*, Vieillot.”

‡ Since the above was penned, the Norwegian collection has supplied us with a specimen of the European Ortolan, *E. hortulana*: its upper-parts are nearly as in *E. melanops*, but the face and abdominal region are wholly different; the latter is nearly of the same rufous tint as in *E. cia*, but mingled with yellowish; while in *E. melanops* the abdominal region is pure light yellow, with dusky streaks on the flanks.

the third, *E. aureola*, is common also in Tipperah and Arracan; and the fourth, I greatly suspect, is *E. pusilla*, Pallas, and certainly the same as that described from a female specimen in XIII, 958, by the name *E. sordida*, Hodgson. I add the description of a male, which I lately saw from Darjeeling.

E. pusilla (?), Pallas. Length about five inches and a half, wing two inches and three-eighths, and outermost tail-feather two and a quarter; the tail forked to the depth of five-sixteenths of an inch: bill to forehead three-eighths, and tarse above five-eighths, of an inch. Upper-parts streaky, the feathers black-centred, set off with rufous, and this margined with greyish-brown; the rufous colour more developed on the scapularies and rump: crown, lores, and ear-coverts, rufous; supercilium and chin pale rufescent, and above the supercilium is a broad black streak, the feathers of which are slightly rufous-edged: wings dusky, the feathers externally margined with ruddy-olive, and tipped paler: tail having a broad oblique white streak on the outermost feather, and a narrow one on the penultimate: lower-parts whitish, with a dusky line on each side of the throat, and streaks of the same on the breast and flanks. Bill horn-coloured, and legs pale. This species is somewhat allied to *E. fucata*, Pallas.*

Alaudinæ. Alauda raytal, Buch. Ham., nobis, XIII, 962. This bird abounds on the white sand-dunes of the Hooghly, where the stream, unchecked by the tide, deposits only fine sand, and the alluvial country round (from this cause) is everywhere light and arenaceous: this Sand Lark being scarcely ever seen except on the flat deposits of white sand within each bend of the stream; but there they are very numerous, and (as usual) their colour approximates that of the surface. Fine specimens measure five inches and five-eighths, by ten inches; wing three and a quarter; and tail two inches: bill to gape five-eighths, and tarse three-quarters of an inch; toes short, the hind-claw

* *Loxia flavicans*, var. *A.*, Latham, = *Emb. icterica*, Eversh.: his *Emb. luteola* is perhaps the female of *E. melanocephala*, but agrees with that of *E. aureola*: his 'Goura Finch' is *E. Lathamii* (v. *melanictera*?): his *Fringilla butyracea*, L., is *Crithagra chrysopogon*, Sw. ('Birds of W. Africa'), which is occasionally brought alive to India from the Mauritius, and kept as a cage-bird: *Fringilla stulta*, Ind. var., is doubtless *Gymnoris flavicollis*: and his *Loxia totta* and *madagascariensis* of India, = *Carpodacus erythrinus*, as was long ago pointed out by Mr. Jerdon.

barely exceeding a quarter of an inch.* Irides very dark brown; bill whitish, with a slight tinge of dusky above; and legs albescent-corneous, the toes pale dusky-brown. The young have a very whitish appearance, from the downy character of their feathers; and all the usual mottlings of young Larks are exhibited by them, though less conspicuously than in most other Larks. *A. raytal* is not much of a musician; but often ventures on short snatches of song, frequently without rising from the ground, and I never saw it mount high like its musical neighbour, the *A. gulgula*, whose habits and song closely resemble those of *A. arvensis*: the haunts of these two species border, and they may commonly be seen and heard at the same time; but this will be on the confines of each others territory. Upon ascending the river Hoogly, a considerable change both in the animal and vegetable productions of its banks is soon perceptible, with the change of the face of the country that has been alluded to. The White Vulture (*Neophron percnopterus*) makes its appearance, which is never seen lower down upon the argillaceous or mud soil; *Buteo canescens* is common; and various little insessorial birds which I have never seen near Calcutta, as *Malacocercus caudatus*, *Chrysomma sinense*, *Cisticola cursitans*, the true British *Curruca garrula*, *Amadina malabarica*, &c., &c., abound more or less; the fauna altogether more approximating that of Hindoostan Proper, and I have no doubt that it would soon yield various novelties to a diligent collector.

Genus *Certhilauda*, XIII, 962. There are two closely allied species of Indian *Certhilauda*, differing only in size: the larger of which, with wing four inches long, must be the true *C. chendoola*, (Franklin,) described to be of the size of the British Sky Lark; while the smaller, referred to *C. chendoola*, *loc. cit.*, has the wing but three inches and a half, or less, and the rest in proportion: the latter may now rank, is *C. Boysii*, nobis (the Society being indebted to Captain Boys for a fine specimen of the former species, which has led to its discrimination). One of them is the 'Crested Calandre Lark' of Latham.†

* The hind-claw of this *Alauda* resembles that of the *Certhilaudæ* and *Pyrrhulaudæ*, as does also its light sandy-coloured plumage; but its other characters are those of restricted *Alauda*.

† Latham's 'Aggia Lark' is *Alauda gulgula*; his 'Finch Lark'=*Mirafra assimica*; his 'Baag-geyra Lark'=*Calandrella brachydactyla*; his 'Slender Lark'=*Anthus malayensis*; his 'Yellow-headed Lark' can only be *Budytes citreola*; and his 'Wagtail Lark' is the female common *Budytes*.

In the 'Madras Journal,' No. XXXI, 136, Mr. Jerdon considers his *A. deva* (*A. malabarica* apud nos,) to be an aberrant *Certhilauda*, nearly allied to *C. Boysii*: but, if so, he must have sent the Society another species as his *A. deva*; for the specimen referred to, is a true *Alauda*, closely allied to *A. gulgula*, but with a pointed crest, and quite agreeing with Scopoli's description upon which is founded *A. malabarica*, Gmelin; whereas *Mirafra affinis*, Jerdon, which Mr. Strickland considered to be the *malabarica*, has too short a wing for that bird, and also does not accord in other particulars.

Genus *Accentor*, Bechstein. This remarkable genus seems to come in no where better than on the extreme verge of the *Fringillidæ*, which I believe to be its natural location.* Mr. Hodgson has recently described (in *P. Z. S.* 1845, p. 34), in addition to *Acc. nipalensis* and *Acc. strophiatius*, *J. A. S.* XII, 958-9, an *Acc. cacharensis* and an *Acc. immaculatus*. Specimens, however, with which that gentleman favoured the Society, having those names attached, I consider to be decidedly of one and the same species in different states of plumage; and I have described each of these phases in my notice of *Acc. nipalensis*. Referring now to Mr. Hodgson's specimens which were so labelled, I still consider his *Acc. immaculatus* to be the adult in worn plumage, which I mentioned in my description of this bird to have been forwarded as distinct; but I cannot equally well reconcile the description of *Acc. cacharensis* with the only young specimen retained for the Museum, though I still greatly doubt its distinctness. I know four well marked Himalayan species of *Accentor*, all of which have been described by me in the Society's Journal, viz. *Acc. nipalensis*, *Acc. variegatus*, *Acc. strophiatius*, and *Acc. mollis*, (vide XIV, 581).

The *Fringillidæ* pass to the softer-billed birds through the great American series of the *Tanagrinxæ*; and from them I believe there is a pretty complete gradation to the *Cerabinxæ*, or South American Honey-suckers. The latter are quite distinct from any of the nectar-feeding genera of the Old World, which may nevertheless follow, and we commence the series of them with the *Nectariniadæ*, (passing over the true *Promeropidæ*, in which *Irrisor* does not rank).

Genus *Arachnothera*, Temminck, treated of in XII, 981, and fur-

* When writing the above, I had not remarked Mr. Hodgson's expressed opinion to the same effect. *P. Z. S.* 1845, p. 34.

ther noticed in XIV, 557. The Society has now eight species of this genus, a revision of which has become necessary.

1. *A. magna*, (Hodgson) : vide XII, 981. Hab. Nepal, Assam, and Arracan.

2. *A. flavigaster*, (Eyton) : vide XIV, 557. Malacca.

3. *A. chrysogenys*, Tem., vide XV, 981. Malay countries. This and the preceding species are allied, but differ much in size : and *A. flavigaster* has a broad circle of yellow feathers surrounding the eye, in addition to the ear-tuft ; whereas *A. chrysogenys* is naked under the eye, and has a semi-circle of yellow feathers above it.

4. *A. inornata*, Tem. (nec apud nos, XII, 982) : *Cinnyris affinis*, Horsfield. Closely allied to the next, but larger, of a brighter and more yellowish green above, the under-parts greyer, and marked more decidedly (especially on the breast) with a dark central streak to each feather. Inhabits Java.

5. *A. modesta*, (Eyton) : *A. latirostris*, nobis, vide XII, 982. Malacca.

6. *A. ———* ? Temminck. Allied to the next, but much larger ; the throat and breast dull albescent-green, with an obscure central dusky streak to each feather ; belly and lower tail-coverts pale yellow ; and a tuft of orange-yellow feathers on each side of the lower breast, ordinarily concealed beneath the wing. Length of wing three inches and a quarter ; of tail two and a quarter ; and bill to forehead two inches. From Java.

7. *A. longirostra*, (Lath.) Smaller than the last, with the same pectoral tufts under each wing ; but the throat and fore-neck are spotless clear dull white, and the abdomen is much deeper yellow. Also from Java.

8. *A. affinis*, nobis ; *A. inornata*, apud nos. XII, 982. Very like the last, but always smaller, and duller-coloured ; the abdomen of a weaker and greener yellow, and rarely a trace (and at most a very slight one) of the orange pectoral tufts. Inhabits the Eastern coast of the Bay of Bengal, from Arracan to Malacca ; and Mr. Jerdon obtained a single specimen of it in the Mysore district, bordering the Neilgherries.

Respecting the other genera of this group, I have little now to add : the *Nectariniæ* are treated of in XII, 969, *et seq.*, and XIV, 557 * ; and

* *Nectarinia malaccensis*, (Scop.), *lepida*, (Lath.), and *javanica*, Horsf., refer to the same species.

the *Dicaeum* group also on the latter occasion.* Mr. Gould has recently figured a curious little Australian bird by the name *Smikrorhis flavescens*, the form and colouring of which approximate those of *Piprisoma agile*; and it seems to lead thence to the hitherto isolated Australian genus *Pardalotus*. Should this affinity be real, a gradation would be here shewn from the Malayan *Prionochilus* to the Australian *Pardalotus*; and the position of the latter genus be thus affirmed.

Fam. *Meliphagidæ*. The most decided Indian representative of this Australian group, occurs in the genus *Zosterops*, treated of in XIV, 562 *et seq.*; and the sole Indian species is evidently the *Sylvia palpebrosa*, Temminck, p. c. 292, f. 3, as described in Griffith's 'Animal Kingdom,' VI, 451; but whether this, or the name *annulosus*, (Swainson), should hold precedence, I have not the means of determining. The *Z. borbonicus* doubtfully referred to this genus in XIV, 564, is, I perceive, on more minute inspection, a decided *Zosterops*, having the same circle of feathers round the eye, only of a dusky hue, instead of the silky-white which renders this circle so conspicuous in its congeners. It is the *Z. cinerea*, Swainson, 'Menageries,' p. 294.† Perhaps the genus *Iora* (treated of in XIII, 380, and XIV, 602,) may come within the extreme confines of the *Meliphagidæ*: and though not much allied to *Iora* (so far as I can perceive), I have less hesitation in bringing the Orioles under the same group.‡ An Australian species of true Oriole (*Gracula viridis* of Shaw) has, indeed, been long regarded as a *Meli-*

* Lord Arthur Hay has discovered a new *Dicaeum* in the neighbourhood of Simla, which he designates *D. sanguinifrons*. "Forehead, occiput, and chin, a rich blood-orange red—more orange than red in dryskins; lower-parts golden-yellow: upper-parts the same, mingled with olive." Dr. Horsfield's Javanese *D. cruentatum*, described in XIV, note to p. 558, is *D. rubrocanum*, (Tem.)

† I named one Mauritius species, *Z. curvirostris*, in XIV, 563; but I find this name has been anticipated by Mr. Swainson, for the "*Dicaeum chloronotus* of the Paris Museum" (vide 'Birds of W. Africa,' *Nat. Libr., Orn.*, VIII, 44). If, however, the latter had been described by the specific name *chloronotus*, Mr. Swainson could have no right to change it, at least without assigning a sufficient reason for so doing; and if undescribed before, it does not appear that Mr. Swainson has published any description of it, that should establish his right of nomenclature.

My *Z. nicobaricus*, XIV, 563, would seem to be merely the young of *Z. palpebrosus*; though I have never seen an Indian specimen in the same plumage. Examples in the ordinary adult garb of *Z. palpebrosus* have now been received by the Society from the Nicobars.

‡ This is an opinion to which I have long been leaning; and I pointed out the affinity of *Plectrorhyncha lanceolata*, Gould, to the Orioles, even to the form of its nest, in XII, 180 (*bis*).

Ch. flavinucha
Buxton
09 J. 10.35 p. 153

phagidous bird, and under the generic name *Mimeta*, has been classed in the present family. Mr. Gould, in his great work on the birds of Australia, has lately established its true generic position; which indeed had been previously indicated by various other systematists.

In XI, 797, I made some attempt to review the Asiatic Orioles, and shall now (with much more extensive materials) resume the subject. The species are as follow:—

1. *O. Traillii*; *Pastor Traillii*, Vigors and Gould. Common in the eastern Himalaya, and occurs in Assam, Arracan, and Burmah. This bird has been placed in all sorts of genera, certain of which have been established for its reception, as *Psarophilus* of Jardine and Selby: Mr. Hodgson long ago recorded his opinion that it is a true Oriole, and in this I quite coincide. Mr. G. R. Gray refers it to *Analcipus* of Swainson, founded on *Ocypterus sanguinolentus* of Temminck, p. c. 499; and another species which Mr. Swainson arranges with it, is his *An. hirundinaceus*, (*Nat. Libr.*, 'Menageries', p. 284,) a bird which he also assigns to India; but Mr. Strickland, who has recently examined the originals (now at Cambridge) of many of Mr. Swainson's descriptions, writes me word that the species in question is scarcely separable from *Artamus* (*v. Ocypterus*), and that it is labelled from Madagascar. How, therefore, such a bird can have any near affinity for an Oriole, and a most decided Oriole (in my opinion), is far from being easy to understand.

2. *O. melanocephalus*, Lin.: *O. maderaspatanus*, Franklin (the female); *O. McCoshii*, Tickell (young male). Very common in Bengal, also in Nepal, Assam, Arracan, and southward to the Tenasserim Provinces; and in some parts of the Peninsula of India, whilst in other parts it is rather scarce. Length of a male nine inches and a half, by sixteen inches; wing five and a quarter, and tail three and a half; of a female nine and a quarter, by fifteen inches: bill to forehead an inch and three-eighths; to gape, one and five-eighths; tarse seven-eighths of an inch. The black-headed Oriole of South Africa, considered identical by Sykes (*P. Z. S.* 1835, p. 62), is a conspicuously different species, with no yellow on the wings: it is the *Turdus monachus*, Gm., termed *O. capensis* by Swainson; who also names another black-headed Oriole, more nearly allied to the Indian species, but from Sierra Leone, *O. brachyrhynchus*, ('Birds of West Africa.' *Nat. Libr.*)

In his "Two centenaries and a quarter of new or little known birds," appended to his volume on 'Menageries,' in the 'Naturalists' Library,' Mr. Swainson has also described an *Oriolus Hodgsoni*, said to be from Nepal; but of numerous Nepalese and other Himalayan specimens, I have seen none that could be referred to it. It is stated to resemble *O. melanocephalus*, except that it is "much smaller, and the tips of the quills are white instead of yellow: middle feathers of the tail yellow, with a black bar nearly across their centre. Total length about seven inches: bill from gape, an inch; to front, eight-tenths: wings four inches and eight-tenths; tail beyond, seven-tenths: tarse seven-tenths." This notice may perhaps lead to its recognition.

3. *O. chinensis*, Lin.: *O. cochinchinensis*, Brisson; *O. acrorhynchos*, Vigors, *P. Z. S.* 1831, p. 97: *Coulavan* of Buffon. This bird, which is not Indian, is remarkable for its very large and highly carinated beak, which is particularly deep at base, and drawn out to a fine point. Forehead yellow, not extending back beyond the hind-part of the eye: lores, spreading above and below the eye, and forming an occipital patch broader than the yellow of the forehead, deep black; this does not, however, reach forward quite to the nares: posterior half of the wing, comprising also the winglet and coverts of the primaries, black; the rest of the wing, or anterior half, bright yellow: tail black, its middle feathers tipped with yellow for three-eighths of an inch, the next for an inch and a half on its outer web, and the outermost for two inches on both webs. Length of wing six inches; of bill to forehead an inch and a half, or nearly so; and of tail four inches. Inhabits China and Manilla.

4. *O. macrourus*, nobis. Closely allied to *O. chinensis*, from which it is distinguished by its longer tail, rather smaller and less carinated beak (which however is always conspicuously larger than in the next species), and by the greater patch of yellow upon the forehead of the male: another distinction consists in the disposition of the yellow upon the tail, which has scarcely any of this colour at the tips of its middle pair of feathers, while the outermost is in old males wholly yellow, with merely the shaft black towards the base,—some specimens shewing one or two insulated patches of yellow, chiefly at the extreme base of the outer web,—and younger males having the tail coloured more as in the adults of the Chinese species, but still with scarcely a trace

of yellow at the tips of the middle pair of feathers. The wings have their longest primaries slightly margined externally with whitish, and in some specimens there is a slight yellow border to the secondaries and tertiaries; while younger males have the whole exterior portion of the secondaries and tertiaries washed with yellowish-olive. The coverts of the primaries are always tipped with yellow, producing a slight spot of this hue, which does not occur (at least in the adult male of) *O. chinensis*. Younger males have, as usual, the back and wings tinged with dusky greenish; and in females (and perhaps still younger males), the same dull colour prevails on the head and neck, the broad black occipital crescent is merely indicated, the feathers of the under-parts have each a black central stripe, and the tail is wholly dusky yellowish above, prevailing throughout the outer webs of all the feathers, while the inner webs are successively more deeply terminated with yellow,—this colour being alone seen underneath, in adults of both sexes. Length about eleven inches, or rather more; of wing six; and tail four and a half to five inches: bill to gape an inch and a half, and tarse an inch. Inhabits the Nicobar Islands.

5. *O. indicus*, Brisson, Jerdon, *Ill. Ind. Orn.* pl. XV: *O. chinensis* et *cochinchinensis* of India, auctorum; *le Lorient des Indes*, Buffon. This differs from the two preceding in its considerably smaller bill; in the yellow of the forehead extending further back beyond the eye, reducing the black occipital crescent, which latter is continued forward in adults, through the ocular region, quite to the nares; in the greenish tinge of the back, even of old males; and very conspicuously in the much greater extent of the yellow upon its wings, while the tail has less than in *O. chinensis*, and its middle feathers have rarely distinct yellow tips: in *O. chinensis*, and some specimens of *O. macrourus*, the secondaries and tertiaries are wholly deep black; whereas, in the present species, the secondaries are broadly margined, and the tertiaries have their whole outer web and part of the inner web, greenish-yellow; the primaries are tipped with the same; and a bright yellow wing-spot is formed by the tips of the coverts of the primaries. Younger males have much more of the green tinge above and on the wings, and the under-parts are much weaker yellow, with black stems to the breast-feathers, more or less developed. They evidently increase in brightness of colouring for several years. Females are yellowish-green

above, with little or no trace of the occipital crescent; whitish beneath, with dark central lines; bill infuscated, instead of pinkish-white, as in the males; and the shape of the beak will always readily distinguish them from the same sex of *O. kundoo*. Length of wing six inches to six and a quarter in bright old males, often not more than five inches and a half in younger males; bill to forehead an inch and one-eighth, or a sixteenth more. Rather a rare bird in India generally, and I have never seen it from the Himalaya. About Calcutta it is very rare; but in the countries eastward of the Bay it is generally common, as in the island of Ramree (Arracan), in the Tenasserim Provinces, and Malay peninsula. The Society also possess it from China.

6. *O. coronatus*, Swainson; *O. hippocrepis*, Wagler. With this Malayan species I am unacquainted, and shall merely cite the following passage from Mr. Jerdon's description of the last, in his 'Illustrations of Indian Ornithology.' "Swainson's *O. coronatus* from Java (as described,) differs from our peninsular *O. indicus*, in its smaller size, shorter wings, tail, and tarsus, and in the narrowness of the black nuchal band. Its bill appears to be somewhat larger than in ours, but shorter than in *chinensis*. Wagler's description of *O. hippocrepis* (which he considers the same as *chinensis*, auct.,) corresponds with it in the yellow tips of the central tail-feathers, and with our peninsular bird in having the black ocular band extending to the nares, and in other points. As, however, his specimens were obtained chiefly from Java and Sumatra, it is most probably Swainson's *coronatus*, with which it indeed agrees pretty nearly in dimensions. The latter are given as nine inches and a half total length, wing five and three-tenths, tail three and a half, bill to forehead an inch and two-tenths, and tarse eight-tenths."

7. *O. tenuirostris*, nobis. An evident young male, resembles the corresponding age of *O. indicus*, except in the shape and colour of its bill, in the much greater extent of the yellow on its forehead, and proportionate contraction of the black occipital crescent, also in its rump having much less yellow, relieving the greenish hue of the back and wings. As in the young male *O. indicus*, and fully adult *O. chinensis* and *O. macrourus*, the black of the lores is not continued forward to the nares; but the separation of colours is abrupt and decided, probably indicating a similarity of extent in the adults: the whole crown is yellow, the black of the occiput not rising above the level of the eye. Wing mostly greenish, the

coverts which show externally not being tipped with yellow, as in the corresponding age of *O. indicus*; but the tertiaries have narrow yellow tips, which also are less developed on the secondaries, and uppermost primaries. Bill longer and much more slender than in *O. indicus*, and of a slightly arched form; its colour fleshy apparently at base, but red for the remainder as in *O. galbula*. Length about ten inches, of wing five and three-quarters, and tail three and a half; bill to forehead an inch and a quarter, and tarse seven-eighths. I believe, but am not sure, that the specimen here described is from Central India. There can be no doubt of its distinctness as a species.

8. *O. kundoo*, Sykes (the female): *O. galbula* apud Sykes (the male), and of Franklin's catalogue: *O. aureus*, Jerdon's *Catal.*: and doubtless *O. galbuloides* of Gould, mentioned in *P. Z. S.* 1841, p. 6. This is the Indian *O. galbula*, auctorum. It invariably differs from the European species in having a larger bill, and in the black streak from the bill being continued backward beyond the eye in the males: from the African *O. auratus*, Swainson, it differs in the colouring of its wings, which resemble those of *O. galbula*. This bird, so very common in the Indian peninsula, and which extends up to the N.W. Himalaya, occurs also in the hilly parts of Bengal, as Rajmahl and Monghyr, and at Midnapore; these hills being off-shoots from the ranges of Central India, and partaking of the fauna of the latter in numerous other instances; but in the vicinity of Calcutta I have never met with it, nor seen it in any collection from the countries eastward: the Calcutta specimens which, on a former occasion, I referred to *O. galbula* (and afterwards termed *aureus*), proving to be females of *O. indicus*.

9. *O. xanthonotus*, Horsfield: *O. leucogaster*, Reinwardt: *O. castanopterus*, nobis, *J. A. S.* XI, 795, (the young male). Peculiar to the Malay countries.

Another very distinct group as a genus, which, though less allied to other *Meliphagidæ* than I consider the Orioles to be, yet offers (in at least the majority of its species) those adaptive characters which many would term the essential features of the family, is that of *Phyllornis* (vel *Chloropsis*), treated of in XIV, 364 *et seq.* To what is said there, and before, concerning this group, I shall now only add that the young of *Ph. Hardwickii* may as well be described, in order perhaps to check its being brought forward as a new species. The plumage is green, more yellowish underneath, the throat pale yellowish, and there is a

little blue mingled with the yellowish on the moustaches: a trace of blue also on the shoulder of the wing, and upon the outer primaries and outermost tail-feathers.*

The *Phyllornis* group conducts to the Bulbous, treated of in XIV, 566 *et seq.*: and the affinity of this distinct family for that of the *Meliphagidæ* is, I think, undeniable. I have little now to add elucidative of a group so lately under review; but may remark, that Lord A. Hay considers the *Pycnonotus hæmorrhous* of the Upper Provinces to be distinct from that of S. India, and proposes the name *intermedius* for the former. There is this much difference, that it would be generally easy to pronounce whether a specimen was from Northern or Southern India, the former having the colours generally better defined, especially the pale margins to the feathers of the upper-parts, and the tail also is commonly longer: but looking to a series of these birds, from Goomsoor, Agra, and Arracan, I do not see that they can be defined apart. Of *P. leucogenys*, Capt. Boys informs me, that it is common down the Indus from Buhawulpore; and that he has lately obtained it near Ferozepore. A *P. rufocaudatus* has recently been described by Mr. Eyton, *An. and Mag. N. H.* 1845, p. 228, which must be put as a synonyme of *Criniger gularis* (Horsf.), *J. A. S.*, XIV, 571. Mr. Eyton also describes an *Ixos metallicus*, which would seem to be allied, except in size, to *Brachypodius melanocephalus*, XIV, 576. The *Turdus indicus*, Gm., as represented in Buffon's figure, of which a copy has been obligingly sent me by Mr. Jerdon, would certainly appear to be a very different species from *Criniger? ictericus*, Strickland, which Mr. Jerdon had referred to *T. indicus* (as noticed in XIV, 570). Lastly, the name *Ixodia*, nobis, XIV, 577, has been forestalled in Botany; as *Ixodes* (as I first had it) had been previously applied to a genus of Spiders; so I shall now take refuge in *Ixidia*, which I trust has remained hitherto unattached.†

Among our late acquisitions from the Nicobars, I must not omit to mention several specimens of *Ixocincla virescens*, nobis, XIV, 575; and of all ages, from youth to maturity. The species is quite distinct from

* The 'Blue-chinned Thrush' of Latham refers to *Phyllornis Jerdoni*; and *Chloropsis gampsohynchus* (mispelt *cæsmarhynchus*), apud Tickell, should have been assigned to the same: my originally mistaking this bird for the female of another species, occasioned me to give it as a synonyme of the latter.

† Latham's 'Hooded Thrush' refers to *Pycnonotus leucogenys*; his *Turdus capensis*, Ind. var., probably to *P. flavirictus*; his *T. cafer*, from India, to *P. bengalensis*; and his 'Tufted Thrush' to *P. melanocephalus*.

Hypsipetes malaccensis, nobis, but can scarcely be placed in a different sub-generic group; and I think it will rank best as an aberrant *Hypsipetes*, showing a marked affinity for *Iole*. The bill is rather shorter than in *H. malaccensis*, and the coronal feathers tend less to assume the pointed form: length about eight inches and a half, of wing from three and a half to nearly four inches, and tail three inches and a half; bill to gape an inch, in some an eighth more; tarse three-quarters of an inch: the tail is a little graduated, but inclines to assume the true *Hypsipetes* shape. Plumage of a uniform olive-green above, the crown infuscated, or of a brownish-nigrescent hue: throat and breast dingy-whitish, a little tinged with yellow; the rest of the lower-parts more deeply and conspicuously tinged with yellow. Bill dusky, with yellow tomia, and elsewhere an appearance of its becoming ultimately wholly yellow: the tarsi plumbeous. The nestling tertiaries remaining on the specimen formerly described, and the outer webs of the nestling primaries, are of a dingy chesnut colour; and there is a shade of the same upon the tail. The same appears to be the case with the young of *H. malaccensis*; and the two species considerably resemble at first sight, but the present may readily be distinguished by its infuscated crown, and its unstreaked throat and breast. E. B.

(To be continued.)

POSTSCRIPT.—I have already to acknowledge another interesting collection, partly from the Nicobars and partly from Penang, just received from our esteemed contributor, the Rev. J. Barbe.

Among the birds, is a finer male of *Palæornis erythrogenys* (note to p. 23, *ante*.) than that previously described; having the nape and interscapularies light yellowish, rather than tinged with hoary-grey, and the under-parts also more yellowish than in the other.*

Of *Todiramphus occipitalis* (*loc. cit.*), it would seem that I described females and young only; for what I take to be the males are considerably brighter, with the wings and tail much bluer, of a decided Prussian blue, the black nuchal collar (continued from the ear-coverts) is much narrower, and in some tinged with blue, and the white supercilia (carried round the occiput) have little or even no tinge of rufous.

* Dr. Cantor possesses a female of *P. caniceps*, nobis (*loc. cit.*), from the Malay peninsula. It has the tail developed to the usual length in this genus; and green above with some blue on its middle feathers, and dull golden-yellowish below; the head less pure grey than in the male; and the bill wholly black, as I suggested it would be in this sex.

Picus moluccensis (verus, p. 16), identical with the Javanese species, is sent from Penang; and I find that it is Mr. Eyton's *Tripsurus auritus*, *An. and Mag. N. H.*, 1845, p. 229,—another synonyme to be added to those reduced in p. 14: Mr. Eyton also describes (*loc. cit.*) a *Picus rubiginosus*, which is a *Gecinus* most nearly allied to *G. malaccensis*, and has been subsequently described by Lord A. Hay as *P. melanogaster*, *Madr. Journ.* No. XXXI, p. 153: but *Bucco quadricolor*, Eyton, is distinct from both the species with which its identity is suggested at p. 14 *ante*.

The most interesting specimens, however, in this collection, are a pair of adults of the *Megapodius* of the Nicobar Islands, and also two undoubted eggs of this bird, of which Captain Lewis prepared only a chick. So remarkable a species may be at once described, however, out of its place in the present series.

M. nicobariensis, nobis. Length about fifteen inches, and of wing nine inches; tarse two inches and a half; middle toe an inch and five-eighths, and its claw three-quarters of an inch; hind-claw seven-eighths. Foot rather small for a *Megapodius*, the middle toe and claw but little exceeding the two lateral in length. General hue of the upper-parts deep olive-brown with a tinge of ochreous, which becomes more decided on the wings; lower-parts dingy greyish-brown, with a slight tinge of ochreous on the breast, and which prevails throughout the under-parts of a presumed female: crown slightly rufescent-brown, prolonged into a short crest, and the occipital feathers impended by the coronal are light greyish: lores, cheeks, and throat, almost naked: the primaries light ochreous on their outer webs, and dusky internally: bill yellow: and legs and claws dark horn-coloured. The chick is coloured nearly as in the adult, but is mottled with faint russet on the wings, and the abdomen has a rufous tinge; the feathers of the head, neck, and breast, having a peculiar hair-like structure. The presumed egg is of a true elliptical shape, or with the small end just distinguishable, measuring three inches and a half in length, and being of an uniform somewhat ruddy stone-colour. The habits of this bird would appear to resemble precisely those of *M. tumulus* described by Mr. Gould. Captain Lewis had seen the mounds, and the birds upon them; but was unaware that the latter had been the accumulators of such huge heaps of material. Upon shewing him Mr. Gould's description of the habits of the Australian species, he remarked that the same account would equally apply to the Nicobar bird, except

that he had observed no heaps quite so large as some of those described by Mr. Gould. The eggs were sent by Mr. Barbe, with merely a notice that they had been "found in the sand."

I have further to acknowledge a rich collection of New Holland specimens, just received from the Australian Museum at Sydney. In Vol. XIV, p. 546, I made a few remarks on Mr. Gould's magnificent work on the birds of Australia, and therefore I shall further notice here, that Mr. Gould's *Carpophaga leucomela* is not a *Carpophaga*, but a *Dendrotreron* apud Hodgson, ranking with *C. Hodgsonii*, *C. arquatrix*, and *C. guinea*, auctorum, having but twelve tail-feathers, &c. &c. : and that Mr. Gould's distinctions of *Eurystomus australis* from *Eu. orientalis* are very erroneous ; as these two species exactly agree in size and structure : but the former is readily distinguished by having the black of the head confined to the lores, and by the brownish hue of the crown and nape, of which no trace occurs in the species of India and the Malay countries ; which latter has the whole head and cheeks blackish, and the nape and back concolorous with the scapularies, in addition to its blue being of a deeper tint. Lastly, the *Anous melanops* figured by Mr. Gould, is certainly identical with a species in the Society's Museum, from the Bengal Soonderbuns ; and which I can scarcely doubt will prove to be the *Sterna tenuirostris*, Tem., from the western shore of the Indian Ocean, or, in other words, the eastern coast of Africa.

Chrysococcyx smaragdinus, nobis. In XI, 917, I considered certain little Cuckoos to be specifically identical, which are respectively inhabitants of India, the Malay countries, and Australia. A better series of specimens now convinces me that three species are here confounded. That of India has already received a name, being the *Trogon maculatus*, Gm., founded on the spotted Curucui of Brown's Illustrations, which certainly represents a variety, or incidental state of plumage, of this species ; but the name is so very inapplicable to the species generally, that it cannot justly be adopted. The presumed male and female described, *loc. cit.*, as *C. lucidus* refer to this species : another presumed female, from Arracan, tends to the *hepaticus*, plumage common to many Cuckoos, having the head chesnut, the back still more cupreous than in the supposed female formerly described, and the lower-parts closely barred throughout with coppery-green upon a white ground, except the lower tail-coverts which are chiefly banded with green and deep rufous :

the tail has its middle-feathers shining green, with a dusky purplish band at tip,—the next pair similar, but with deep rufous broadly margining the basal half of their outer webs,—this rufous is successively more developed on the two succeeding pairs,—and the outermost has its exterior web and the contiguous portion of its inner web pure white, banded with shining green, which extends also over the rufous portion of the inner web : terminal third of the bill dusky, the rest translucent pale straw-yellow in the dry specimen. Another supposed female is throughout in the *hepaticus* plumage, or rufous above, white below, with greenish-dusky bars throughout, the outermost tail-feather marked with white chiefly on its exterior web, and the two next tail-feathers slightly tipped with white : bill, with the basal half amber-coloured, the remainder dusky. Another, again, is of a predominant dull glossy green above, with the same rufous and white on the tail, but its middle-feathers are also obscurely barred with rufous, and most of the wing-feathers are margined with the same : bill wholly dusky. Lastly, another is chiefly of a dusky hue above, scarcely glossed with greenish, the feathers having slight rufous margins more developed on the wings ; and tail as in the last. In all, however, the under-parts are *much* more closely banded than in the Australian species ; and the wing measures generally four inches, or sometimes four and a quarter in adults. Inhabits the hilly parts of India, but seems to be everywhere rare. Brown figures it from Ceylon ; and I have seen it from Central India, Rajmahl, Arracan, &c.

Chr. basalis : *Cuculus basalis*, Horsfield : *C. chalcites*, Tem. : *C. malayanus*, Raffles. This seems exactly to resemble the last, except in its constantly smaller size ; and it is equally variable. Wing three inches and a half to three and three-quarters. It holds the same relationship to the Indian species, which *C. lugubris*, Horsfield, does to *C. dicruroides*, Hodgson, and *C. flavus* does to *C. tenuirostris*. The specimen described in XII, 944, was not, I believe, from Macao (as I was informed), but from Malacca. Specimens corresponding to the adult male of *Chr. smaragdinus*, have not hitherto fallen under my observation.

Chr. lucidus (?), Gm. : *C. metallicus*, Vig. This is the Australian species, corresponding in size to the first, but having constantly, so far as I have seen, a black bill, the under-parts much more distantly banded, and presenting various other distinctions.

Note on the Geological features of Zillah Behar. By Lieut. W. S. SHERWILL, B.N.I., Revenue Surveyor.

The geological features of zillah Behar may be divided into four great divisions, viz.—the granitic, the quartzose, the hornstone, and the sandstone. Commencing from the eastern boundary of the zillah, where it abuts upon zillah Monghyr, the hills are in general composed of confused masses of fatty quartz abounding with mica, which is generally found adhering to the quartz. In many places fine veins of mica are worked and the produce exported to Patna. The principal mines are to the south of Rujowlee, both in the granite and quartz ranges. The country at the foot of these hills is thickly strewn with minute particles of silvery mica, brought down from the hills by the rains, and entering largely into the composition of the soil: much of it is collected by the natives and used for whitewashing their houses, ornamenting pottery, toys, &c., giving to the articles thus smeared, a lively sparkling appearance and an unctuous feel; the roads and beds of Nullahs sparkle in every direction from the abundance of this mineral. Immediately on the boundary of zillah Monghyr the granite peak named Kawa Kho rises, from out of the quartz hills, to the height of 1,165 feet; another small patch of granite also appears about five miles to the S.W. from the peak. The quartz hills are covered to their summits with forest trees, brushwood and bamboos, but as they advance to the westward and become granite, they rise into bold and lofty peaks, some upwards of a thousand feet in height.

After leaving Rujowlee, the granite of these hills is found of every hue and texture that it is possible granite can possess or be composed of. In some places porphyritic granite is found, the individual component parts of which are enormous; in others eurite, where the individual component parts are undistinguishable from their minuteness, and in other places syenite is found. Also occasional masses of ponderous black mica are found scattered about in company with large masses of the gassy and fatty quartz so common to granite formations.

At the spot where the Calcutta Trunk Road crosses these hills, large blocks of gneiss are seen protruding from the fine black soil, and in most of the ravines and deep water-courses the same mineral is found. In the bed of the Mohunneh river, to the west of the Dunghye Ghat, on the old Calcutta Road, and where it issues from the hills, the water

has laid bare a beautiful bed of gneiss several miles in extent, crossing the Behar boundary and entering zillah Ramgurh: but from the great depth of soil and from the dense forest on the banks of the river, I was unable to trace how far it extends east and west. In the Dughye Pass, gneiss of peculiar beauty is scattered about in every direction. The summit of this pass at the village of Tillee Tand I found to be 1,300 feet above the level of the sea: it is covered with thick forests, haunted by tigers, who destroyed some men of my establishment whilst engaged surveying these hills. A spur of this granitic range strikes off from the main body and suddenly terminates in the bold mountain, known as the "Muhair hill," (vide map and vignette.) The volcanic range of hornstone hills appear at this spot to overlay the granite, which again appears on the other side of the hornstone, distant about eight miles. This granite extends westward to ten miles beyond the Koël river, or 120 miles from the mica mines at Rujowlee, varying in height from a hundred to a thousand feet: some of the peaks are bold and imposing, but much of this range is composed of a low, undulating and broken plateau of table land, especially the great mass which forms a spur from the Vindhya mountains and lies in pergunnah Sherghotty. This irregular mass, averaging from five to eight miles in width, is composed of coarse granite, covered with a dense jungle of underwood, intermixed with forest trees, affording an inexhaustible supply of the coarser wood, for building, manufacture of ploughs, yokes, sugar mills, &c. besides yielding a plentiful supply of bamboos, grass, a variety of medicinal herbs, barks, roots, leaves and fruits which are collected at various seasons, and used in the zillah or exported. The wild silk (tusser), is also collected from the Asun trees (*Terminalia alata tomentosa*) and exported. The principal tree is the Saloogunje or Salè, a tall handsome tree, with a smooth shining white bark, high clear stem, wide spreading branches, and of a highly resinous nature, and from which a gum or resin is collected and used as a varnish chiefly by the Palanquin makers. This tree answers to the description of the North-African frankincense tree. The dhak tree, byre, kheir, mimosa and semul, are the most common trees in these woods.

The Samba stag (*Rusa*), spotted axis, neelghaee, tigers, leopards, and a variety of smaller animals inhabit the depth of these woods. At Deoree, a series of low hills are detached from the body of the table land, and are much impregnated with veins of serpentine. Near the

village a meagre bed of this mineral has been quarried for a few years by natives, who manufacture cups, knife-handles, &c., from the best specimens. Captain Richard Ouseley, Principal Assistant to the Governor General's Agent S.W. Frontier, had a shaft sunk, or rather a huge pit opened, in the hopes of reaching a good bed, but without success; at the depth of thirty feet only a coarse friable granite was found; nor did I perceive in the sides of the pit any traces by which hopes could be upheld of ever finding any at that spot. Perseverance may perchance yet discover a valuable bed of this handsome mineral. Several slabs, three feet in length, were obtained by the Honourable E. Drummond, Magistrate of Gya, but being from the surface and much decayed, were good for nothing, although very handsome both in colour and texture.

To the north of this great plateau, numerous little granite hillocks are dotted over the plain, extending for twenty-five miles north, amongst which is the large Chirchanwan hill, five miles in length, but to the N.E. they extend for forty miles as far as the Burabur hills, a range of black sterile granite rocks, in which are some very curious groups, peculiar to the granitic formation; particularly that of Kawa Dhole, a conical peak, rising to 365 feet in height, on the summit of which rests a conical block of granite of immense proportions. It is upwards of forty feet in height, standing on its base, without flaw or crack, a landmark for miles around.

On the summit of this group, iron ore of a rich quality is scattered about in profusion. This is the most northern point to which granite can be traced in Zillah Behar.

Returning to the west, a group of very curiously formed peaks are clustered together, six miles south of Kootoombeh. One in particular from its appearance is styled the Kothila (vide Map and Vignette) or granary. In these hills is found, in small quantities, the sulphate of alumina adhering to some of the rocks; it is styled *silajeet* by the natives.

The granite range after crossing the Koël Nuddee suddenly ceases in numerous small hillocks, and is here joined by the sandstone, an offset from the Kymoor sand and limestone range. Eighteen miles further up the Sone river, the granite again appears in one or two hillocks piercing the sandstone. After crossing the Koël river from the east the country undergoes a complete change. The *Tar* tree (palm) becomes scarce and eventually ceases altogether, the surface of the country be-

comes covered with the *Mimosa catechu*, a few ebony trees and an abundance of saloogunje trees. The hills are clothed with the fragrant rhoussa grass, from which a powerful spirit is extracted, so beneficial in rheumatism, and known in Malwa as "Grass oil." The surface of the country is undulating, the soil tinged with bright yellow and red hues, the effects of the oxide of iron, which ore is found in its soil. The hills are low towards the north, and higher to the south; exceedingly steep to the south, and sloping away gradually to the north. The long range of hills skirting the Sone river, are so steep to the south that a stone may be jerked from the summit to the base, but on the north the termination of their base is a mile removed from the plumb-line of their crest. Ten or fifteen miles south of the Sone river, on the table land of Oontaree, iron ore is collected and smelted by the Aghurreeas. Immediately under the ruined fort of Srinugger, the waters of the Sone have denuded a series of nearly vertical strata of hornstone, arranged in narrow serpentine ribbons; this hornstone again appears about half a mile down the river, at Darehdeh, and has the appearance of having been fused, being of a dark pitchy hue, smooth, rounded, sonorous when struck, difficult of fracture, and heavy. A belt of the same rock appears in the bed of the Sone jutting out from the Shahabad or north side, about two miles above Darehdeh: the rock at this spot has exactly the same burnt appearance. Embedded in this hornstone are found masses of a hard claystone of a bright red colour, also common amongst the pebbles of the river, which pebbles generally consist of rounded pieces of agate, hornstone or quartz, possessing but little beauty or variety. The rocks at this spot, projecting more than half-way across the stream of the Sone, create rapids of about six feet fall in a quarter of a mile. At a village named Phoolwurreea, about four miles inland from the Sone, there is a spring of good water. At this spot a fair is held during the months of *Kartik* and *Chait*. At a spot (marked S.) in the sandstone a small quantity of alum is manufactured from alum slate, but by what process, I could not learn. Specimens of the slate were sent marked 359.

The natives call this sulphate of alumina, *silajeet*: it is the same substance as that brought from Nepal, and sold under the same name at the enormous price of one rupee the tola. The sandstone, on the eastern and western banks of the Koël river, is similar to that in which are situated the Rajhurrah coal mines, eighteen miles from the Behar

boundary, and is of various textures, some exceedingly hard, others very soft.

The stone from the Khyra peak, which rises to 1,086 feet, is much used for hand-mills, curry-stones, and for other domestic purposes. The whole of this sandstone is covered with a thin covering of forest trees, underwood, and bamboos; the Saloogunge tree predominating every where. The valleys are filled with the Mimosa catechu, many hundreds of which trees are yearly destroyed in the manufacture of the catechu.

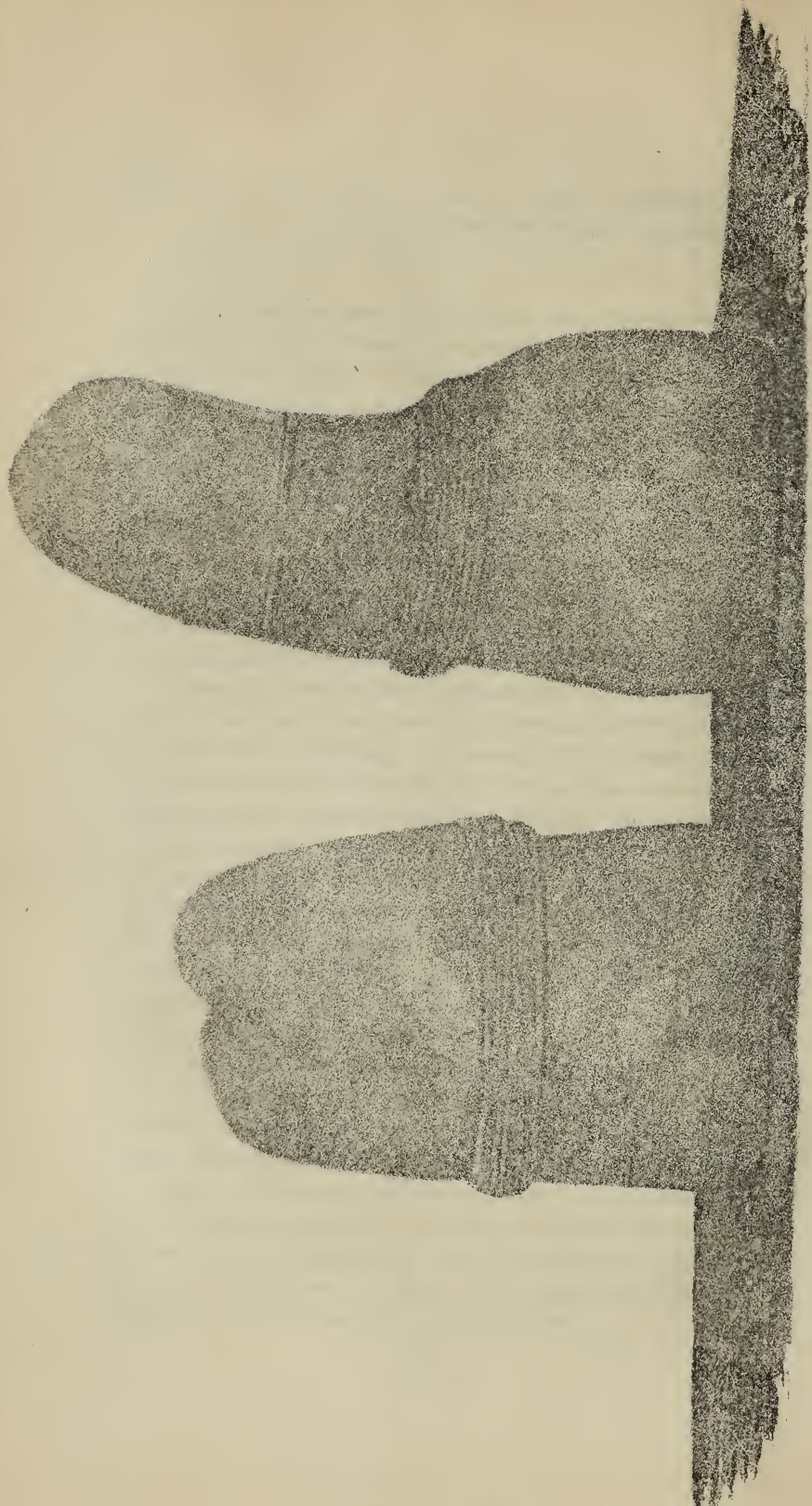
The next group is that of the hornstone, or Rajgheer range of hills, which although slightly mixed with quartz and jasper, must nevertheless be considered as a hornstone range. The hornstone is of both kinds, conchoidal and woody: the former is found of endless varieties, bright-red, purple-blue and other lively colours, uniting to render this an elegant stone: the latter is universally of a greyish-green colour. This double range of hills presents a series of ragged peaks, offering views of great beauty: their extent is about forty miles from S.W. to N.E. A small hill, evidently a portion of the range appears at Behar; another small hill, about eighteen miles due east of Gireenk, and another again twelve miles to the south, uniting with the quartz range and granite peak of Kawa Kho. In this range are numerous hot and cold springs, especially at Rajgheer, where there are nineteen hot wells and four cold: on the southern face of the hills, there are a few hot springs similar in character to those of Rajgheer. Half way between the Rajgheer and Burabar hills is situated a collection of hillocks, from which is quarried hornblend of a beautiful texture; the crystals are large and glossy: also a quantity of potstone, which is much used at Gya by the natives in the manufacture of dishes, plates, mortars and pestles, likewise by the image cutters, who are famous for the elegance of their carvings. A small quantity of potstone, but of an inferior quality, is quarried from the Bruhmjoonee hill, overhanging the city of Gya. A small hill, west of the station of Gya, yields an indurated reddle used for dyeing clothes of an orange colour, also for metalling the roads in the station; this mineral is either of an orange, purple, light-red or yellow colour.

These few notes, combined with the accurate and minute details by Dr. Buchanan, will I hope, render the accompanying Map intelligible.

*A Note on some Hill Tribes on the Kuladyne River ;—Arracan. By Lieut.
T. LATTER (67th N. I), of the Arracan Local Battalion.*

Φοιτῆ γὰρ ὑπέρ ἀγρίαν ὕδαν, ἀνά τ' ἄντρα καὶ πέτρας.

There are few facts more remarkable in India, than the vast number of tribes which occupy its mountain fastnesses, and which roam through its interminable forests ; all speaking distinct dialects. In many instances such tribes are, as far as distance is concerned, near neighbours ; though in reality almost perfect strangers ; a state of alienation, in a great measure arising from the dense and impervious vegetation, always occupying the lower mountainous ranges of this country. And in no part perhaps is this peculiarity more strikingly exemplified than in the Yooma range of hills, which separate the province of Arracan from the Empire of Burmah. On the banks of the Kuladyne river, which runs down the 93° parallel of longitude, and within a space over which a bird might speed in a summer's day, may be found the following clans—the *Khúmís*, the *Mrús* (of which there are two tribes, speaking distinct dialects), the *Anoos*, the *Kyaus*, the *Khóns*, the *Shentoos*, and finally the *Khyoungthas*. Although the languages of all these may have originated from the same stock, yet there is quite as much difference between them as between French and English. The most powerful among them are the *Shentoos*, who being beyond our frontier, are known to us only by their devastations on those tribes which pay us tribute ; the suddenness, secrecy, and never-failing nature of these attacks, cause them to be held, by the rest, in a dread of which it would be impossible to give an idea. The *Khóns*, who are likewise beyond our frontier, are employed by the *Shentoos* as guides and spies, and are on that account obnoxious to the vengeance of those clans, who may owe a blood feud to the *Shentoos*. They reside during the night in huts built on high trees, and return with the day to their regular habitations below. The remaining tribes are all more or less under our rule, and have consequently given up their feuds. With the exception of the *Khyoungthas* or “ Sons of the Stream,” all the rest of the tribes, above enumerated, go under the general term of *Toungthas*, or “ Sons of the Hill.” I shall proceed to give a slight sketch in the following order of the *Khyoungthas*, the *Khúmís*, and the *Kyaus*, which three clans fell under my observation during a short trip up the Kuladyne.



Two-thirds the natural size

KHYOUNGTHAS.

The *Khyoungthas* are only found on the banks of the Kuladyne river, and their livelihood is principally gained from plantations on its banks. They may be viewed as the type of the *Arracan* race; they speak the Burmese language, but with all the harsh provincialisms of the Arracanese. There are many terms in the Arracanese dialect totally distinct from Burmese: as *shay*, "little, small;" *ara*, "more;" *shán*, "thing," and many others, just in the same way as words are found peculiar to certain counties in England. The *Khyoungthas* appear to have been a portion of the original inhabitants of Arracan, driven up the river at the time of the invasion and occupation of the province by the Burmese. Their religion is a simple type of Boodhism, but mixed up strangely with the *Nát* or "spirit" worship of the hills; which appears in some instances almost to have absorbed their original faith. Their parent stream is looked upon with a holy love, not only as affording them sustenance, but likewise a ready passage by which to flee from the attacks of their foes. At the northern outskirts of each village from which quarter alone they dread the advent of any danger (all to the south being in possession of the English), in the direction of the forest, and under the shade of the comeliest tree may be seen the shrine of their two *Náts*, the one male, the other female. They are represented by two pebbles picked from the banks of the river. The female is considered the most powerful, and is meant to represent the *Mayoo Nát*, or spirit which presides over the mouth of the Mayoo river: she is believed to be a most powerful spirit, the guardian of Arracan from all the dangers from the sea. The road from Akyab to Chittagong crosses the mouth of the Mayoo river; here all natives, whatever may be their faith, invariably make their offering to this powerful spirit by letting loose fowls, &c. The other or male spirit is styled *Rwátsaung Nát* or "the village guardian," to whom, as his name implies, is intrusted the care of the village. They believe, to use their identical words, that "should he withdraw his favour, the evil eye would glare upon their children; sickness would devastate their hearths; the floods would sweep away the foundations of their homes; and their most favourite haunts would become the prowl of the tiger, and wild cat o'mount." Whenever a new shrine is to be erected, fresh stones are chosen, the village is tabooed for

seven days, sentinels are placed on all the surrounding heights to prevent the ingress or egress of any person, and sacrifices of fowls, and pigs are made. Around each stone is wound some cotton thread, coloured yellow with turmeric.* These objects however are still further curious, for it will be perceived by inspecting the plate that they are rough representations of the *lingum*, and *yoni*. The colouring with turmeric is Boodhistic, for yellow is the sacred and royal colour of Boodhism. In the simpler types of Boodhism which have come under my observation, whenever the worship of the powers of nature has been introduced, it has been invariably that of the united male and female; of which the latter has been the most powerful. This is the true explanation of those monuments which abound in the Cossyah hills, figured in a very interesting paper from the pen of Lieut. Yule, in a volume of the Journal of the Asiatic Society of Calcutta. Another interesting fact illustrated by these objects, is the invariable predilection of the human mind to identify the object of its worship with the realities of its every-day life. This circumstance might be exemplified by instances throughout the whole history of man; whether we take the objects of worship themselves, as that god, "downwards fish, and upwards man," worshipped in the fish coasts of Azotus; or their consecrated residences from the dark cave temples of the Troglodyte, to the spired fanes of the dweller in tents. And, as we shall see, whilst the *Toungtha*, or "Son of the Hill," looks for sustenance to the clearings of the forest patch, or the scant verdure of his rock-bound hills, and conformably represents the idea of his adoration; so here we find the "Child of the Stream" fitly choosing from the rolled pebbles of his parent flood a simple fetich, wherewith to identify the object of his worship, and his love.

THE KHUMIS.

The *Khúmís*, as I have already remarked, are a member of the general family of the *Toungthas*, or "Sons of the Hill." They are a numerous tribe, having several villages, each under a distinct *Toungmeng*, or "mountain chief." This authority appears originally to have been

* These stones are represented two-thirds their real size in Plate I, fig. *a* being the female, and fig. *b* the male. They are shewn erect for the sake of giving their forms; they are in reality however placed lying down in a flat position; each having a sort of baby house erected to receive it; they are in the Plate shewn in their relative positions with one another.

hereditary; whilst in those villages within the British territory, it being necessary that the village chief should be acquainted with the Burmese language for the purpose of transacting Government business, an individual on account of such qualification is often raised to that dignity; and thus in some villages there exist two *Toungmengs*, the one hereditary, the other elected. The religious system of the *Khúmís* appears to be very vague; it consists of the worship of numerous *Náts*, or spirits, and indeed of every thing that strikes their fancy. They worship the earth as the author and giver of all they possess; the sun also, in its noon-day height, as the pledge of safety from their foes—for the attacks of these mountain tribes are never made except during the night; no single night passes over their head that is not replete with terror. They reverence also the spirits of the dead; these, they say, at times flit over their ancient haunts, at others wing their way like birds over mountain and vale. The spirits of the good they think ever happy, those of the wicked miserable. Each house likewise has suspended from its walls the skulls of the animals it may have killed for food; to these likewise they pay a simple adoration, by placing before each individual a handful of its wonted food, as an acknowledgement of the sustenance it has afforded them in its time. The skulls also of the animals slaughtered by their fathers are in like manner preserved as much in remembrance of those deceased relatives as a monument of their wealth; frequently will a chief point to them with pride, and tell you how many mountain bulls his father could spear for a marriage feast. Their religion may be said to consist of nothing but the worship of spirits; to every object that strikes their fancy, they accord a spirit of its own. Each peak in their native hills, they hold to be the mountain watch-tower of a god. Nothing could illustrate this better than the accompanying translation of part of a *Khúmís'* prayer. Previous to an undertaking or expedition he lets loose a fowl as an offering to the spirits, and utters the following: "Oh! spirit of the day-sun; Oh! spirit of the rock-ledged gate*; Oh!

* These are two very singular wall-like ridges of sandstone, running across the *Kuladyne*, about twenty miles the one above the other. They are not rocks like those of *Colgong* on the *Ganges*; but ridges perpendicular on each side, and only a few feet in width; the river has forced itself a passage through the centre. The tradition is that when the spirits found their domains invaded by a new faith from the plains, they endeavoured to raise a barrier; this was forced: a second attempt in like manner failed, and in despair they have given up the idea of a third.

spirit of the streams of the *Hoosalong**; Oh! spirit of the surges of the *Kolak*†; Oh! lords of the mountain peaks‡; One, two, three, four, five, six, seven, eight times; take ye this my offering.”

Every object which is in motion they conceive to be so, in virtue of a spirit, and a motion of its own: in fact to be animate. This is a belief which has been shared by all primitive and savage tribes; and is one that will at once appear to be most natural. The simple savage, judging from the movements of his own person, gives a spirit and a will, as inherently the cause of movement in all things. It is the predilection of the modern mind to count all as phenomena; the cold results of causal agencies beyond. And when in this its last stage the mind carries itself back to the first; when it spiritualizes the dull realities of this every-day world; and writes down every sensuous object in nature as impelled by a spirit and motion like its own; then, having achieved a communion with all existing things, it becomes seized of the highest poetry, and purest ideality. This is the simple reason why the poetry of a rude age is to us, as rich in its ideality as is that of the most polished epoch. In this respect the human mind may be conveniently classed into three stages—The 1st and savage, where it believes all objects whatever to have life and spirit. The 2nd, where it has so far advanced as to accord a separate individuality to the spirit, and to hold that, like a guardian, it presides and watches over the inanimate. And finally, the 3rd and last, that which we have above described. Those peculiarities which are the source of poetry in the last, are unideal, mere common place matters of belief in the first. And even in poetry, such as that of Homer, which we may look upon as the annals of the mind in what we have described as its second stage, many of those wondrous figures which appear to us, the living transcripts of mysterious portraitures traced upon the secret wall of the chambers of the poet's imagery, may in reality be but the simple and unimaginative record of the beliefs of his every day existence.

The *Khúmis* have no religious superiors, although they pay a certain respect to some who, profess to have converse with familiar spirits.

* The name of a stream among the Hills.

† The original is *vóm* of the *Kolak*, the latter being the name of a stream; *vóm*, in their dialect is a place partaking of a character of both, a waterfall and a rapid: at the mouth of the *Kolak*, the river rattles its way over a shallow rapid, and being impeded in its course by a great number of ridges of rock, it has the appearance of a huge seething chaldron.

‡ Here they generally enumerate the most remarkable peaks.

When a man marries, he gives what he can to the parents of his bride, feasts his native village, and the ceremony is concluded. The dress of the *Khúmi* female, in common with that of the *Toungthas*, is a parody on Eve's apron; the men have a small cloth over the loins but are still next to naked; the women wear a petticoat about a cubit in length, which is kept on in a most indescribable manner by heavy strings of brass rings. They have a singular tradition accounting for the scantiness of their costume. In former ages, say they, all the world was of one tongue, and of one kind; there was then a god upon the earth—his name they do not know,—when he was about to depart from among men, he divided them into nations and tongues, and gave to each the peculiar costume by which it was to be distinguished. The poor *Toungthas*, however, were at the time wandering over their native mountains, and engaged in their plantations in the hills, so that they came last. The god told them he had given away all that he had, except one small piece of cloth, a cubit broad, which their women were to wear; the men to shift as they could. The only visible objects of worship of the *Khúmis*, are the trunks of three or four trees, which have been cut down in clearing a space for the village; also the same number of pillar-like stones. These are fixed in the earth together, in the middle of a large shed, which is also employed as the place of reunion and festivity of the village.

The cultivation of the *Toungthas* is styled *Jhoom*. A hill, the best covered with vegetation, is cleared, the rubbish burnt to fertilize it, and the space sown with an indigenous species called hill or red rice. As the soil on these steep hills is necessarily scanty, and becomes more liable to be washed away by the periodical rains when denuded of its forest covering, a piece of ground rarely yields more than one crop; in each successive year other spots are in like manner chosen, till all those around the village are exhausted: a move is then made to another locality, fresh habitations are erected, and the same process gone through. These migrations occur about every third year, and they are the means by which long periods of time are calculated; thus a *Toungtha* will tell you that such and such an event occurred so many migrations since. In forcing one's way through the forest, one often comes suddenly on a deserted village, which presents a peculiarly melancholy appearance; a dense vegetation rapidly reclaims it as a domain of ancient wood; the very bamboos long since decayed and old, the materials of a once merry home, become covered with luxuriant creepers, and appear mockingly to vegetate

with a new-born life at the absence of man. Compelled thus to wear away an errant life, and in continual dread of being massacred by their foes, the poor *Toungthas* know not what comfort or secureness is; all their valuables are secreted in some hidden cave, known only to themselves. Should the maiden weave for herself a choice petticoat, or the young man fashion a favourite bow, it is forthwith taken and stowed away: and yet, in spite of all, they are a merry and laughter-loving race, fond to a passion of beads, with which they profusely decorate every thing that belongs to them: one little *Khúmi* damsel showed me her pet pipe so ornamented.

Having thus endeavoured to give a general sketch of the *Khúmis*, I will proceed to a few remarks on their language.

The *Khúmis*, in common with all the *Toungthas*, have no written characters. Their dialect is evidently cognate to the Burmese, that is, the pure and original Burmese, but it presents itself under the harsh type of the Arracanese, not softening down any of its sounds in the usual manner of the Burmese language. It is monosyllabic, and expresses the relations of its parts of speech by means of affixes; of these some seem to be merely euphonic, as *mă, gă, vă, tă*, &c., these generally occur between the root and its affixes. In like manner, for the sake of euphony, some of its roots are slightly inflected, as *tchau*, "to eat," when preceding the past affix *bau*, or *bauk*, is changed into *tcha*. It is moreover necessary to premise that all final consonants such as the *k* in the above word *bauk*, are invariably mute, that is, not pronounced, but *formed* in the mouth. Indeed by a person whose ear was not rendered sensible to the value of these finals by an acquaintance with the Burmese language, of which they are a marked characteristic, the above word *bauk*, would be written *bau*. As we might expect in a rude, and unformed tongue, the affixes, above alluded to, are omitted whenever the sense can be conveyed without them; as *kai*, 1st pers. pron. and *pè*, "give," form *kai pè*, "give me," or it might equally convey "I give;" *kai*, "as above," and *yu*, "wife," *kai yu*, "my wife;" *bok* "food," and *tchau*, "eat," *bok tchau*, "eat food."

NOUNS.

Mau signifies "in;" as *um mau*, "in the house." *Hloyó*, "under;" as *um hloyó*, "under the house." *Hí loungó*, "on the top of;" *um hí loungó*, "on the top of the house." *Téó*, "near;" as *um téó*, "near the

house." *Báo*, "from;" as *um báo*, "from the house." *Brăn*, "outside;" as *um brăn*, "outside the house." *W'ó*, "by or by means of." The final *ó*, in all these, implies "to, towards," which sometimes for the sake of euphony, is pronounced *vó*.

Tchee is the affix of the plural number with nouns, but it is not made use of when numerals are employed, they being sufficient to express plurality; as *um*, "a house," and *nú*, "two;" *um nú*, "two houses."

Like the Burmese, the *Khúmís* have only one affix to express the female, whilst several affixes express the male of animals.

Tchíáu is a male affix for human beings. *Tchǎ* is a female affix for human beings. *Nú* is the general female affix. *Poh* is a male affix; as *tchí poh* "a son;" *tchí nú*, "a daughter."

P'ting, is a male affix for large animals; as *tchíe p'ting*, "a bull;" *tchíe nú*, "a cow." *Painoh p'ting*, "a male buffalo;" *painoh nú*, "a female ditto." *Kounggnau p'ting*, "a stallion;" *kounggnau nú*, "a mare." *K'sai p'ting*, "a male elephant;" *k'sai nú*, "a female elephant."

Loh is a male affix for smaller animals; as *úí loh*, "a dog;" *úí nú*, "a bitch." *Miyaung loh*, "a male cat;" *miyaung nú*, "a female cat." *A'úk loh*, "a male hog;" *áúk nú* "a female hog."

Lúhi is a male affix for birds; as *áa lúhi*, "a cock;" *áa nú*, "a hen." *Tawo lúhi*, "a male bird;" *tawo nú*, "a female bird."

Hái is a superlative affix; as *hauí hái*, "very beautiful."

VERBS.

The relations of verbs are expressed by affixes.

Au is the substantive verb; as *kai au*, "I am."

The present tense has properly no affixes; as *yé*, "to fear;" *kai yé*, "I fear."

The future tense and present tense are often used synonymously.

There is an affix *tán*, implying present time, used with some roots signifying "quality;" as *khǔmđi tán*, "is cold," *roch tán*, "is dear;" but it is very irregular in its application.

The future is formed by the addition of the affix *nák*, which, when the roots end with a mute consonant, often has the euphonic vocal *gǎ* intervening; *kai tói nák*, "I speak, or will speak;" *kai tchěk gǎ nák*, "I go, or will go."

The past tense is expressed by the affix *bauk*; as *kai tchĕk bauk*, "I have gone."

The imperative is expressed by the simple root, and is distinguished from the present tense by having no nominative case.

Mŏn, or *maun*, are interrogative particles.

With reference to the negation of sentences, there appear to be various negative particles. *B'* is used to negative the substantive verb: as *kai b'au*, "I am not." *Mok*, *mauk*, *auk*, *au*, *ămŏn*, are all variously used as particles of negation, the first two are prohibitive.

They do not appear to have an affix of number for verbs; the noun which is the nominative being sufficient to shew the time of the verb; as *kai tchĕk gă năk*, "I go, or will go;" *kai tchee tchĕk gă năk*, "we go, or will go."

In the formation of sentences, the nominative comes first, the objective next, and the verb last. There are however some cases in which this order appears varied.

NUMBERS.

We now come to the mode of numeration, and in this dialect it presents some interesting peculiarities. The numeral system of the *Khúmís* is emphatically decimal; of the ten fingers. It is moreover so intricate as to be somewhat difficult of explanation. This fact admits us into a very peculiar phase of "savagery." We are apt to consider the mode of reasoning and every thing appertaining to an uncivilized race, as necessarily bearing the impress of simplicity: and this may be said to be generally the case, but at times the savage mind seems to take to itself flights of intricate and almost obfuscated reasoning.

The first peculiarity which we shall notice is, that the decades, or multiples of ten, up to hundreds have two names; thus as they count on their fingers when they get to "twenty," they call it first *horé laik horé*, which means literally "ten and ten," and then throwing their fingers on an imaginary heap they exclaim *apóng ré*, "a score," and so on. *Ré* is an affix used with numbers, and implies "full."

The next circumstance to be noticed is, the number of different terms used to convey the idea of "and, more."

1, *hnák*. 2, *nu*, (*u*, like the simple French *u*). 3, *t'hoon*. 4, *p'lu*. 5, *páng*. 6, *t'ru*. 7, *s'ru*. 8, *téya*. 9, *t'khau*. 10, *ho*, or *horé*. 11, *horé laik hnák*.

(from here *laik* implies “and, more”). 19, *horé laik t'khau*. 20, *horé laik horé*, or *apóng ré*. 21, *apóng p'hai hnák*, (here *p'hai* commences to convey “and, more”). 29, *apóng p'hai t'khau*. 30, *apóng p'hai horé*, or *p'hairé*. 31, *p'hairé p'lu hnák*, (here *p'lu* conveys “and, more”). 34, *p'hairé p'lu p'lu*. 39, *p'hairé p'lu t'khau*. 40, *p'hairé p'lu horé*, or *wí p'lu ré*. 41, *wí p'lu páng no hnák*, (here *páng no* represents “and, more”). 44, *wí p'lu páng no p'lu*. 45, *wí p'lu páng no páng*. 50, *wí p'lu páng no horé*, or *wí páng ré*. 51, *wí páng t'ru hnák*, (here *t'ru* expresses “and, more”). 55, *wí páng t'ru páng*. 56, *wí páng t'ru t'ru*. 60, *wí páng t'ru horé*, or *wí t'ru ré*. 61, *wí t'ru s'ru hnák*, (here *s'ru* expresses “and, more”). 66, *wí t'ru s'ru t'ru*. 67, *wí t'ru s'ru s'ru*. 70, *wí t'ru s'ru horé*, or *wí s'ru ré*. 71, *wí s'ru téya hnák*, (here *téya* represents “and, more”). 77, *wí s'ru téya s'ru*. 78, *wí s'ru téya téya*. 80, *wí s'ru téya horé*, or *wí téya ré*. 81, *wí téya t'khau hnák*, (here *t'khau* conveys “and, more”). 88, *wí téya t'khau téya*. 89, *wí téya t'khau t'khau*. 90, *wí téya t'khau horé*, or *wí t'khau ré*. 91, *wí t'khau ho hnák*, (here *ho* expresses “and, more”). 99, *wí t'khau ho t'khau*. 100, *wí t'khau ho horé*, or *tchoon wairé*. 101, *tchoon wairé aikhlók hnák*, (here *aikhlok* signifies “and”). 110, *tchoon wairé aikhlók horé*. 120, *tchoon wairé aikhlók apóngré*. 200, *tchoon wai nuré*. 202, *tchoon wai nuré aikhlók nu*. 303, *tchoon wai t'hoon ré aikhlók t'hoon*. 1000, *tchánggré*. 2000, *tchángnuré*.

1845 would be thus written—*tchánggré aikhlók tchoon wai téya ré aikhlók wí p'lu ré páng no páng*.

It will be remarked in the above, that not only for 31 do they say “thirty and one,” or “thirty more one;” and for 45 “forty and five,” or “forty more five;” but that moreover they have several different terms to express this increment “and, more.” We will recapitulate them. Between 10 and 20, the term is *laik*; between 20 and 30, it is *p'hai*, which it will be seen is likewise the term for “thirty;” and from “thirty” upwards each decade has the unit next above its own to represent the increment “and, more.” Thus the third decade, that of “thirties,” has “four;” and for “thirty more one,” they say “thirty four one,” &c. The fourth decade, or “forties,” has “five,” and for “forty more five,” they say “forty five five;” and so on with the rest. Above a hundred, *aikhlok* represents the same term.

It would not be easy to give a reason for this peculiarity, unless perhaps that the true “more” of a number is the one immediately

above it ; and that therefore the "more" of the third decade is aptly "four," and so on. It will be remarked, that from 40 to 90, the term *wí* represents "ten ;" thus *wí*, "ten," and *p'lu*, "four," make *wí p'lu* "forty." It will be moreover perceived, that between 40 and 50, the term *pangno*, is used instead of *pang*. It is probable that the first is the correct term, and that the latter is merely an abbreviation. The name *t'hoon*, "three," is the same as in the Burmese language, only that in the latter it is pronounced softly *thoon*. The term *pang* or *pangno*, "five," is evidently derived from the same root *pǎngnya*, "wisdom," as is the Pali term *pēgntsa*, "five."

A peculiarity which so remarkably characterizes the Indo-Chinese languages does not exist in this dialect ; and that is, that there are no numeral generic affixes ; thus *um*, "a house," and *nu* "two," are sufficient to express "two houses." In the case however of human beings there is a kind of adjunct used either with or without numerals ; as *khúmí*, "a man ;" *khúmí laungnu*, "two men ;" *tchípau*, "a child ;" *tchípau laung t'hoon* "three children."

THE KYAUS.

There is only one village of this tribe in existence ; it is situated on the banks of the Kuladyne, and in the midst of the large clan of the *Khúmís*. The *Kyaus* relate that their tribe was originally numerous, but that now this single village is all that has been spared from the attacks of the *Shentoos* and other powerful neighbours. The *Kyaus* are viewed by the rest of the *Toungthas*, with a kind of estrangement ; few among these latter being able to master their dialects. The first thing that strikes one on entering the village of the *Kyaus* is their marked difference in physiognomy from that of all the other hill tribes. Indeed the general physiognomy of the *Toungtha* is a Tartar-like family face, but the *Kyaus* in feature, dress, and appearance could scarcely be distinguished from the lower class of the Bengali peasantry of Chittagong. The *Khúmís* are fair, with small features : the *Kyaus* are dark, with large features. The *Khúmís* invariably wear a cotton head-dress, and their hair tied upon the crown, and shave no portion of their head : the *Kyaus* on the other hand shave a few inches of hair from the forehead, tie it low down on the

neck, and wear no head-dress. On first seeing them I felt convinced that I had fallen in with the original type ; the etymon, as it were, of the Bengali. Though repeatedly asked whether they had any tradition of having come from Chittagong, they invariably replied they had none. On this however much stress could not be laid, as from the wandering and miserable life they lead, no tradition could well extend among them above a couple of hundred years. I consequently turned to their language, and found it presenting the marked characteristics of the dialects of Trans-Gangetic India, being monosyllabic, and having affixes to express the various relations of its parts of speech, and even not possessing the euphonic inflexions which sometimes occur in the *Khúmí*. If the *Kyaus* are an archaic type of the Bengali, as their extraordinary physiognomical similarity and their marked estrangement from the tribes around renders to my mind most probable, it goes far to prove that the original dialect of Bengal was monosyllabic and consequently rude ; and that its nature and structure has been entirely revolutionized by the polished polysyllabic languages of Hindoostan. The *Kyaus'* ideas of worship are very rude and simple like that of the rest of the hill tribes. They erect upright stones in different portions of their village, which they consecrate to the *Náts*, or spirits of the hills.

With reference to the dialect of the *Kyaus*, not having had the same time at my disposal, or the same means of making enquiries into it, as I had for that of the *Khúmís*, my remarks are necessarily more scanty. The *Kyaus* dialect, as has been already remarked, is monosyllabic, and possesses affixes.

Ka is the nominative affix, chiefly used with a noun, in construction with a verb in the present tense ; in which case the verb dispenses with its own affix of time. This idiom is singular, as it shows that the time of the nominative case, and that of the present tense are the same. *T'k'té*, or *i'k'tau* are future and present affixes. The two finals *té* and *tau*, I suspect to be nothing more than expletive. In this dialect as well as in that of the *Khúmís*, the future and present tenses are the same.

Mau, affix of the interrogative mood, occurs last in a sentence after all others. It may also be applied directly to a noun without the intervention of the substantive verb, as *sípa* " child," and *mau* interrogative from *sípa mau* " child ?" *i. e.* " Have you any children ?" This is one of abundant instances of how crudely ideas are expressed among a rude people.

Rau and *t'rau*; imperative termination: as *tshé* "to go," *tshé t'rau*, "go." *Mă* is a negative affix, and always occurs *after* the root; as *tshé m'rau*, "don't go." In this it differs from most dialects, the particle of negation, generally and correctly, preceding the statement of the act which it is meant to cancel. In asking however a negative question, the order is somewhat varied. The interrogative pronominal occurs first, the negative next, then the personal pronoun, and finally the verb; thus *arong*, "why—" *ma*, "not—" *na*, "you—" and *houng*, "come," make *arong ma nahoung*, "Why don't you come?" In this case it is peculiar that the interrogative model-affix is not used, the interrogative pronominal being sufficient to mark the clause to be a question.

Ak is an auxiliary affix of negation used only with the substantive verb *ám*, "to be," in which case the true negative *má* is united with it, into one word *m'ak*; *m'tshál* "husband," *am* "is," *m'ak* "not."

Ien is likewise an auxiliary affix of negation, similar to the Burmese *bhoo*; as *tshé m'ien* "(I) won't go."

NUMBERS.

The numeral system of the *Kyaus* is not intricate like that of the *Khumis*. It is decimal.

1, *khát*.—2, *niek*.—3, *t'hoom*.—4, *m'lí*.—5, *nga*.—6, *órook*.—7, *s'ree*.—8, *rúet*.—9, *kó*.—10, *tchúom*.—11, *s'mré khát*.—12, *s'mré niek*.—13, *s'mré t'hoom*.—20, *tchúom niek*.—21, *tchúom niek lé khát*.—22, *tchúom niek lé niek*.—30, *tchúom tchoom*.—33, *t'chúom t'hoom lé t'hoom*.—40, *t'chúom m'lí*.—50, *tchúom nga*.—60, *tchúom órook*.—70, *tchúom s'ree*.—80, *tchúom rúet*.—90, *tchúom kó*.—100, *r'za*.—101, *r'zalé khát*.—200, *r'za niek*.—222, *r'za niek lé tchúom niek lé niek*.—1000, *sankha*.—2000, *sankha niek*.—1846, *sankha lé r'za rúet lé tchúom m'lí lé órook*.

It is to be noticed that one very peculiar and characteristic idiom of the Indo-Chinese languages, such as the Burmese, Siamese, Malay, is entirely wanting, as far as I could make out, in these two dialects above described. I allude to numeral generic affixes. The numeral, as in English, is placed in immediate relation with the noun, whereas in the others it is placed in relation to a generic affix; as where the Burmese say "dog," two animals; the *Kyaus* and *Khúmís* say merely "dogs two." But still as these hill dialects are so evidently cognate to the Burmese, it is singular if they do in reality lack so characteristic a trait; and

therefore I cannot but suspect, that a better acquaintance with these dialects would reveal them ; and that I was unable to make myself understood in that part of my enquiries.

None of the tribes to which we have referred in the above pages are in possession of any alphabetical system. Unless indeed we except the *Khyongthas*, who being in reality pure Arracanese, have consequently the Arracanese or Burmese characters. With reference to the remainder, it is as yet a matter of doubt, among those who have turned their attention to the subject, whether, for the purposes of education, their dialects should be adapted to the Roman, or the Burman alphabet. With reference to the first, the only thing that can be said in its favour is, that it will save their European instructors the trouble of learning the Burmese alphabet. With reference to the second, a crowd of arguments appeal in its favour. In the first place all these dialects are evidently cognate to the Burmese language, not only so in sound, but also in structural peculiarities ; all their finals are exactly similar to those of the Burmese language, being required to be formed in the mouth but not uttered ; this single peculiarity, which in Burmese is represented by a mark called *that*, would require some outlandish configuration to be conveyed in an European alphabet. Secondly, the instruction which these people could possibly receive *directly* from European instructors must be comparatively small ; as with the exception of a few short months, their mountain-fastnesses are inaccessible to an European constitution ; and therefore native teachers formed in the plains, where Burmese is vernacular, would necessarily become the principal instruments. Thirdly, the Burmese language is used as the medium of communication with the English Government, and therefore there are always a number of persons in every village familiar with it. Fourthly, there are fewer sounds foreign to the Burmese than to the English language. I remarked but two, viz. the *v* in “*van*,” and the *u* in the French “*plume*,” “a feather ;” these could easily be supplied by characters conformable to the general type of those of the Burmese alphabet ; as has been done by the American Missionaries at Tavoy in the case of the *Karen* language.

In the following list the *coronna* as in the word *p'laung*, represents the *a* considered by the Burmese as inherent in every consonant, similar in sound to the first *a* in “*papa* :” the *u* with a dot under it represents the *u* in the French word *plume*, “a pen.” The other accentuated letters will explain themselves.

<i>English.</i>	<i>Burmese.</i>	<i>Arracanese.</i>	<i>Khúmi.</i>	<i>Kyāū.</i>	<i>Bengali.</i>
air	lé	lí	alí	khlí	boiy'r
ant	pärwottshiet	päróttshiet	paleng	m'rtshi	hpín yrá
arrow	hmyá	mrá	tái	t'har	tír
bird	guhët	gnhák	tawó	vá	thóróí
blood	thwé	thwí	t'hí	t'hí	lóh
boat	hlé or thām- bhán	hlí	p'laung	m'laung	náón
bone	äyó or yó	äró	ähók	rú	hánr
buffalo	kywai	kywai	painoh	chaláwé	mónhis
cat	kyoung	kroung	míyaung	meng	bílé-í
cow	nwámá	nwámá	tchí-nú	charráp'nú	gái
bull	nwáhpó	nwábóh	tchíp'ting	charrá tsál	arú
crow	kyēē	tchägīn	óák	w'-á	gáooá
day	né	răt	ní	níding tá	din
to-day	khōné	goní	wänní	—	ájíya
sun	né	nín	k'ní	ní	thoorúj
to-morrow	něthpän	hnaprän	kondam	—	kulya
yesterday	yämāné	yamāné	yandoo	—	kulya
dog	khwé	khwí	úí	úí	koonr
ear	ná	ná	kánnăũ	ná	kán
earth	myé	tamīn	k'l-lóng	níung	bhoóin
egg	ăoo	ăoo	k'dúl	ärtúí	bauda
elephant	tsheng	tshan	k'sái	sái	hátí
eye	myëttsie	myatsie	ămík	mě-et	thókh
father	ăhpă	ahpa	ng'-á-í	pá	bábá
fire	mēē	meen	mái	má-í	ágún
fish	nga	nga	ngăũ	—	máns
flower	pän	pan	k'tshón	—	fooll
foot	khyé	khřípoá	ăkók	—	t'héung
goat	tshiet	tshiet	m'è	kiear	sághul
hair	tshăn	tshăn	tchám	tchám	thúl
hand	lēt	lát	ăkú	kúet	hát
head	ookkhoung	oogoung	ălú	lú	mát'há
hog	wēt	wát	ăúk	vauk	hoorr
horn	gyó	gró	t'kí	—	thing
horse	myěng	mrán	kaunggnăũ	korá	gorá
house	ieng	ieng	um	eeng	ghórr
iron	thăn	thăn	t'măũ	tír	lóar
leaf	ărwēt	paroa	ăgnám	ărr-nú	pháthá
plaintain	nghët py-	ngha pyau-	tchaung	kiluen na	kélá kă
leaf	aurwēt	roa	gnám	—	pháthá
plaintain	nghët pyau	ngha pyau	kúttí	kiluen	kélá
plaintain	nghët pyau	ngha pyau	kúttíătáit	ămrá	kélá p'hol
fruit	thēē	thee	—	—	—
dawn light	leng	lan	kúwang	kawátá	bhor
mankind	loo	loo	khúmi	m'tshí	mánoos
monkey	myouk	myouk	h'láit	j'úang	bandur

<i>English.</i>	<i>Burmese.</i>	<i>Arracanese.</i>	<i>Khúmi.</i>	<i>Kyāū.</i>	<i>Bengali.</i>
moon	lă	lă	lăū	khya	chán
mother	ămie	amie	gna-au-í	noo	mán
hill	toung	toung	măū-í	kh'lang	phár
mouth	khăndwěng	pátsa	l'baung	m'khá	moonkh
musquito	khyěng	kh rán	cháng-ráng	tcheen- tchám p	mónsha
name	amee	namee	ă-mún	n'rmíng	nám
night	gnyee	gnyee	wúm	kulloh	ráit
oil	tshēē	tshee	ătauk	tchírut	téil
river	myeet	mriet	yangpáng	típ-e	dórdjéa
road	lăm	lan	lám	lám m	p'hónt
skin	ăré	aré	ăpik	ăvún	sám
sky	koungkeng	goungkan	k'ní	mítshóm	átlumán
snake	mywé	mrwí	púwí	mrúi	háp
star	kyay	kray	k'tshí	ărshí	tára
bracelet	lětgouk	lagók	k'tshí	—	károo
stone	kyouk	kyouk	lóngtchaung	lúng	shíl
tiger	kyá	kyá	t'káí	kăúí	bákh
tooth	ăthwá	thwá	haw	há	dánt
tree	theetpěng	theetpan	díngkaung	tíng	gáas
fruit	ăthēē	athēē	ătáit	—	p'hól
village	ywá	rwá	ăwáng	kó	p'hára
water	yé	rí	túí	tóí	p'hání
yam	myoukōō	myoukōō	ăhó	bál	áloo
wife	măyá	mieyá	ăyú	napoí	bóh
husband	lěng	lan	yú-wó	m'tshál	khushum
white	hpyōō	hproo	k'loong	ăgnoung	dhóph
black	mee	mee	p'noong	ăvaum	kálá
red	nēē	nee	p'líng	ătshen	láll
blue	pyá	gnyoo	k'dáp	ărait	măshych
good	koung	koung	ăhauí	atshá	góm m
bad	tshó	tshó	hauí- auk	tsha măk	kh ráb
beautiful	hlă	hla	ăhauí	ămenhlá	shoondur
ugly	măhlă	mahlă	ăkoochí	tsha măk	góm m noi
I	nga	nga	káí	keema	ámie
thou	thěng or něng	than	nán	nama-tá	t'hoomí
he and she	thōō	thōō	ní	nengmăgata	óí
to go	thwá	la	tshĕk	tshé	jána
to fear	kyouk	krouk	yé-e	tchí	dórr ash
to be	shie or hie	hie	aun	ám	ăshie
to give	pé	pí	pè	pé	déna
to speak	pyau	prau	tóí	tchong	khótá khau
to come here	la or youk thechma	la rouk diĕhma	youk hĕc	houng tó	ái cenyüt

English.	Burmese.	Arracanese.	Khúmi.	Kyāū.	Bengali.
year	ăhneet	ahneet	—	khúm	busr
milk	nó	nó	—	tchok	dhoot
child	ăkhălé	ashay	doungdí	—	hpooá
offspring	tha	tha	tchípau	sípá	hpooá
male	youkyá	youkya	noungboo	m'tshí	morod
(man)			tchiáú		
female	miemmă	miemmă	noungboo	n'pang	máiyunla
(woman)			tchă		
a boy	loogălé	kolay shay	noungboo	m'tshál	morod
			tchiáú		hpooá
			doungdi		
a girl	miemmă gă- lé	miemmă shay	noungboo	noukté	máiyunlá
			tchă doung- dí		hpooá

The following is a list of *Khúmi* words. The English is the meaning they have in that dialect. The Burman is the term that comes nearest to them; although often the Burman term does not express all the meanings of the *Khúmi* one.

Burman.	Khúmi.	English.
hluot	p'th'lau	to abandon, leave, let go
shie or hie	aun	to be, remain, abide dwell in
hnǒng	pyák	to be able, can
hpooăt or khyó	ăhóp	to bathe, wash
hpooăt	t'mooi	to rub
htá	khăt	to put, or place
shé	mon	front
ăpáú	hiloung	above
thó	wau	to, in direction of
nouk	ningthon	behind
tshairé	angyok	to abuse, insult
pyoo or look	pan	to do, act, work
ienghtoung	póng	marry a husband
ienghtoung	neng	marry a wife
théthwa	dók	to die
shěng	ahíng	to live
yay	păuoo	to laugh
gnó	ăwóh	to cry, weep
shóikshoo	ătăhó	to breathe, pant
goo-yăkhoo	wái	now, soon
kó kókway	ăuí	to worship
hóh-lma	hóh	there
wa	p'lóp	cotton

<i>Burman.</i>	<i>Khúmi.</i>	<i>English.</i>
hneet thět	gnaing	to love, to want
kya	klá	to fall
mógh ywá	k' ní nǎik	to rain
átoo	wán ré	alike, similar
aáloon	pèpè	all
tsiet tshó	p'lu naí	angry
khyá-t'khyá	tākā or krá	another
iet	ǎ-í	to sleep
nó	anlau	to wake
iet	tchǎ khón	a bag
htoung	htoung	a basket
wá	úvv	a bamboo
khá	ǎkhó	bitter
khwai	khéi	to break, snap
yoo	youhai	to bring
yoo	lóh	to take
meeloung	p'tau	to burn
thenggyóh	ōō	to bury
khāu	hǎin	to call
hpǎn kǒing	p'too	to catch, hold, seize
ǎhpó-nec	átien	cheap
ǎhpómyá	róik	dear in price
khyam	khūmdí	cold
ǎtsiet	amáí	a bead
tsiet pǎdie	lǎing	a necklace of beads
kyét	áa	a fowl
hlēē htoo	báik	to cut, carve
tsootswot	tchooí	wet, damp
thé thwá	d'wí	to die
nět	htók	deep, as water, also to drag,
thouk	nǎ-í	to drink [pull, draw]
thwé	p'hooí	dry
pyee	khóí	full
ǎlát	k'khók	empty
thee	hí	this
dǎyay thǎmǎng	tchoo tchook	a deer
oodoung	touk dáí	a peacock
átoung	ǎmó-í	a feather
toungpǎn	p'khí	a wing
nwé poo	bhí	warm
yǎ	ná	to find, get, obtain
twé	ǎ-wóm	to meet with, find
khyoung	tawó	a stream, a bird
pyǎn	ankhan	to fly as a bird
kǎzá	ámák	to play, jest, amuse
phōrá	k' ní y'long	God

<i>Burman.</i>	<i>Khúmi.</i>	<i>English.</i>
thé nat	mái { pauk {	mái "fire" a musket pauk "tube"
bhayhneet	ayé ré	how many
htămēng	bók	dinner

The Bengali terms given in the first part of the above are those of the dialect of Chittagong. With reference to the *Khúmi* and *Kyāū*, there are some that are interesting, as presenting instances for that predilection to onomatopœia so characteristic of archaic dialects. The first we will notice is the term *tawó*, a sound which may be heard echoing through the still forest, and emitted by many of its winged denizens. The next *oák*, and *w'-á*, especially the first, admirably represent "a crow." The term *úí* "a dog" is uttered with a strong and sudden intonation on the first syllable; it is a sound constantly in their mouths employed to frighten those animals from their never-varying occupation of pulling every thing about in search of food. It is probable also that the Burman term *khwé*, had the same origin. The terms *m'-è* "any thing of the goat species," and *ǎúk* "a hog," *mí-yaung* "a cat," are likewise instances of the same kind. It will be remarked, that in the *Khúmi* dialect the term for "Sun" enters into composition for that of "God;" as also that in Burmese, *Khúmi*, and *Kyāū*, the term for "Sun" conveys also the idea of "day," in contradistinction to "night."

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Diary of an Excursion to the Shatool and Boorun Passes over the Himalaya, in September, 1845. By Captain MADDEN, Bengal Artillery.

The writer of the following notes has been induced to commit them to paper, in the hope of their proving interesting, from the fact that a portion of the route traversed is comparatively little known, and so far as published information is concerned, is nearly new ground in botany; though of ornithological and entomological tours, several have appeared from the pens of Captains Hay, Hutton, &c. The tract in question is scarcely ever quoted for plants in 'Royle's Illustrations,' and the writer is therefore induced to believe that the new habitats here given, may not be without their use to some of the many travellers, who now annually cross the Himalaya, from Simla to Kunawur. To those amongst them who are novices in the mountains, he would recommend attention to the following particulars, as tending considerably to remove the difficulties, and enhance the pleasures of the trip.

1st. Avoid forming a party of more than three, in consequence of the difficulty, increasing in a geometrical ratio, of obtaining supplies and porters for a greater number.

2nd. Change the latter daily; one may thus halt at pleasure without expense, when desirable; the rate of payment is only three annas per diem instead of four, as near Simla, and the difficulty, often a serious one near the snowy range, is obviated of procuring large supplies, and of adjusting the fair rate to be paid for them; a frequent source of angry

and interminable discussion. It is also advisable to secure the coolies from fraudulent deductions by paying or seeing them paid in person. A heavy bag of pice is useful in many villages, where the inhabitants cannot often produce change for a rupee.

3rd. Encumber yourself with the least possible number of servants ; but let these be able-bodied, in sound health, and warmly clothed ; their falling sick will cause much delay and inconvenience : and on no account start without a small tent for their use.

4th. Let this tent (and your own) be only of such a weight that one strong man can carry it well, even when soaked with rain ; and to effect this the better, let each of the party have his own tent.

5th. As the heat in the low vallies is very great, take some light clothing, and a copious sola-feather hat. If inclined to hepatitis, a doubly-lined umbrella is indispensable ; and a green gauze veil or pair of goggles to protect the eyes from the glare of the snow, especially in spring : many have been temporarily blinded from this 'cause defective.' The traveller should avoid the vallies as much as possible ; many of them are infested by flies of which the bites are exceedingly poisonous, and when irritated, terminate in dangerous sores. A double wax-cloth, to keep one's bedding dry, is essential, and five times as many pairs of shoes as you would expend at Simla in an equal period. The country-made articles sold in the shops there, will not, particularly during wet weather, stand more than a hard day's work on the rugged paths of the interior ; and in the end, the purchase of European shoes will be found to economize cash, space, and skin.

6th. Let your cups, jugs, plates and dishes be of metal ; with these only may you defy fate and falls ; and as for provender to adorn them, an ample supply of tea, sugar, Carr's biscuits, hermetically sealed soup and bouilli, fowls, sliced bread re-baked into everlasting rusks, with a liberal allowance of beer, wine, and brandy, the latter precious article insured against damage by being decanted into curaçoa or other stone bottles. Nor lastly, must a liberal proportion of tobacco be excluded from the category ; be assured Molière was not far wrong when he said 'Quoique puisse dire Aristote et toute la Philosophie, il n'y a rien d'égal au tabac'—at all events when jaded by a severe walk, and all other creature-comforts out of sight. Amidst the fulness and listlessness of Simla, one may dispense very stoically with many of these things, but

after the hard exercise and keen air of the mountain tops, nature asserts her rights, and speaks through the stomach, in tones which can be neither mistaken nor denied. The direction of the journey being determined before-hand, much trouble and expense will be saved by the establishment of a depôt at some convenient spot on the return route.

7th and last. Some quarter of a century since, Stalker, Welsh, and other out-fitters used to furnish the innocent Cadet with certain pounds of tobacco to be given to the sailors "for doing little jobs;" such, as well as presents of coarse powder and small shot—will be found really serviceable in the Himalaya, where they are all scarce and bad. A judicious exhibition of these coveted articles will often secure a cheerful endurance of cold, wet, danger, and fatigue; the fumes of the tobacco stimulating the sensorium of the mountaineer, as those of loyalty and chivalry do, or did, that of the Frenchman. It is needless to add that the contrary method of abuse, blows, and violence, irrespective of its immorality in contravening the expressed will and orders of our honourable and honoured masters, is almost sure to defeat its intention, and to lead to the desertion of those subjected to it.

September 3rd.—Left Simla with Lieutenant Bouchier, of the Artillery, and walked to Fagoo, distant eleven or twelve miles, in four hours and forty minutes. The rocks at Simla are chiefly clay and mica slate, with quartzose sandstone towards the west, and a crystallized limestone at Jutog; the road lies along the northern face of Jaka mountain, which is here composed of a deep-blue clay slate, and not of limestone, as erroneously stated by Captain A. Gerard. The forest is here chiefly formed by the Ban oak (*Quercus incana*); and in the steep precipitous ravines to the right, grows abundantly the *Deutzia Brunoniana*, which bears a considerable resemblance to the common *Syringa*. Quitting this, the road gradually ascends the south or bare side of the ridge which connects Jaka with Muhasoo: the north side is covered with a forest of Mohroo oak (*Quercus dilatata*): and at 8 or 9 miles from Simla, the summit of Muhasoo is attained, upwards of 9,000 feet above the sea; the route is latterly through a fine forest of cedar, Rai (*Abies Smithiana*), and the Kreoo or Kurshoo oak (*Quercus semicarpifolia*), and descends to Fagoo, 700 feet below, through beautiful hanging woods of maple, pindrow, or Jhunera pine (*Picea pindrow*), horse chestnut (*Pavia*

indica), below the road, and a multitude of shrubs, Viburnums, *Lycesteria formosa*, *Limonia laureola*, black currant, &c., under which in May and June, the large pure white ladies' slipper (*Cypripedium cornigerum*) flowers in abundance. The Putees (*Aconitum heterophyllum*), *Circæa cordata*, and the blue-flowering chereyata (*Halenia elliptica*) are also both common on Muhasoo and at Fagoo. On the pleasant downs behind this latter, the *Primula denticulata*, the sundew (*Drosera muscipula*), *Viola cœspitosa*, and the pretty little eye-bright (*Euphrasia officinalis*), are all common, though less so than in the interior.

To the resident of Cawnpore or Ferozepoor, nothing can be more delicious than the freshness of the Fagoo woods in spring. The lofty stems of the pines are enveloped by the huge ivy and *Ampelopsis* climbers; and in the autumn, when the leaves of this last turn bright red and copper, the effect is very rich, and is said to resemble that produced in the North American woods by species of oak, maple, and sumach. All our oaks here are evergreens. The Tree-Rhododendron and *Andromeda*, which cover whole mountains of the outer ranges, become rare at Fagoo, and are seldom met with in the interior: so very limited in width is their favourite belt. They are however abundant on the Sutlej between Seran and Tiranda. The boiling point of water is 198° at Fagoo.

September 4th.—Detained for coolies; all those available being secured for Prince Waldemar and suite proceeding to Simla, and Colonel Fullarton and his party bound for the Roopin Pass.

September 5th.—To Puralee, ten miles, in four hours; the first seven miles, as far as Synj, are for the most part a steep and uninteresting descent to the Girree; the *Morina wallichiana*, which flowers in May and June, and the *Scutellaria angustifolia* are common. The glen of the Girree is so warm for most months of the year, that it is advisable, if practicable, to descend in the afternoon and merely pass the night in it; but fishermen will run all risks, and there is said to be good fishing ten miles lower down. Puralee is about two and a half miles up the valley from Synj on the same bank of the river, which, between these villages, forces its way through a deep rocky defile on the brink of which the road is carried for half a mile. There is a good breadth of arable land in this part of the valley, and the climate being very warm, the products are nearly those of the plains—barley, wheat, kodah

(*Elsine coracana*), cheena (*Panicum miliaceum*), till (*Sesamum orientale*), and various species of *Phaseolus*. Puralee boasts a small bungalow of one room, which is cooler than a tent, but by no means so clean, being infested with almost all the insect plagues of Egypt.

September 6th.—To Kotkhaee, twelve miles, which we walked in five hours ten minutes. The road lies for three miles or so, up the right bank of the Girree, and then crosses by a good Sanga to the left bank, along which it continues for the rest of the route in a constant and rather wearisome series of ascents, descents, and sinuosities. Kotkhaee, “the Fort of the Fosse,” is a picturesque spot at the junction of several streams from the east and north, which first here give the Girree the character of a small reach, about the same size as the Hosilla in Kemaon, and like it rising short of the snowy range. The thermometer boils here at 202°, which gives about 6,000 feet elevation, about 500 more than is generally allowed to Kotkhaee. An excellent bungalow of two rooms had just been finished by Mr. Erskine, 150 or 200 feet above the left bank of the river. Across the stream, on a precipitous rock at the angle formed by the Girree, and a stream from Huttoo, is “the palace” of the Kotgooroo chief; it is an emblem of his own mind, being a ruin, which only shines under the brush of the painter. Consequent on the imbecility of the chief, the district has long been under British management. A clump of cypress (*Cupressus torulosa*) grows in the vicinity of the palace; the other trees are chiefly Kail pine (*Pinus excelsa*.) On the route to-day I noticed in the corn fields abundance of the pretty *Hibiscus trionum*, for which Dr. Royle goes as far as China. A species of *Vicia*, resembling *V. cracca*, is common amongst the thickets. Considerable quantities of iron are smelted at and around Kotkhaee, and conveyed on mules to Simla and the plains.

September 7th.—To Deorah or Dehrah, about twelve miles, in five and three-quarter hours. Three miles from Kotkhaee the road crosses to the right bank of the Girree, and then leaves the glen to ascend the Shunkun Ghatee, over the high neck joining the Koopur mountain on the SE., with Toombroo and Huttoo on the left. The Pass is probably from 9,000 to 9,500 feet above the sea, and on the ascent occur *Abies smithiana*, *Picea pindrow*, and in considerable numbers, *Populus ciliata*: this I find, the natives of the plains invariably mistake for the peepul. If the word *populus* comes from peepul, it would go to prove that the separation of

the Latin nations from the Hindoos took place after the establishment of the latter in India; the peepul not being known in the high countries to the north, whence the Hindoos are supposed to have emigrated. The converse may indeed be true, that the northern tree is the original peepul. On the grassy summit of the Pass, the *Morina longifolia*, the *Sibbaldia procumbens*, &c. are in abundance. From this point the source of the Girree may be seen to the right, at about 10,000 feet elevation on the Koopur mountain, below which the stream penetrates by a deep rocky and wooded chasm, a spur from Koopur which would otherwise turn it down by Deorah to the Pabur. The locality is well worth a visit, especially following the Chumba range from Bulsun and Puthernulla. A little beyond Koopur, and connected with it by the Puthernullah Pass of the map, is the still loftier three-peaked range in the Tiroch territory, called Kunchooa; the Urrukta ridge of Royle and Fraser, an appellation apparently taken from a fort now dismantled, and scarcely known to the present inhabitants. From the presence of birch, silver-fir, *Anagyris barbata*, &c. the Kunchooa summits are probably little under 12,000 feet elevation; there is a difficult route over them from Deorah to Choupahl *viá* the Puthernullah Pass of the map. The view is fine from the Shunkun Pass, including the Jumnotree peaks to the east, the Choor, Shallee, Huttoo, Fagoo, &c. The Koopur mountain is composed of gneiss rock, like Huttoo; but the Shunkun Pass is of a decomposing micaceous shale, down which the road, some times steep and rocky, proceeds for four or five miles to Deorah, which is seen directly beneath. Deorah, often called simply Durbar, is the residence of the Rana of Joobul. The last Chief, Poorun Chund, was drugged to imbecility by his Wuzeers, in order to ensure the management of the country remaining in their own hands; this policy failed, as our Government assumed and still retains the management; but the legitimate claimant, an intelligent boy of eight or ten, is promised the restoration of the Raj when he attains his majority. His palace is an extensive and lofty square pile, surmounted by turrets, slated in the concave Chinese style, not uncommon in the Himalaya; it is picturesque and has often furnished a subject for the tourist's sketch book; the best view is from the Saree road. It stands from 6,000 to 6,400 feet above the sea, the thermometer boiling at $201\frac{1}{2}^{\circ}$, and being surrounded by high mountains, is rather a warm spot. But the traveller has the advantage

of a small bungalow, the last on the route to the snowy range. Here commences the rice cultivation so general in the valley of the Pabur. Bathoo (*Amaranthus anardana*), kodah, cheena, and tobacco, are also cultivated. The country is fertile and populous; the neighbouring mountains, especially to the south, where a long and lofty spur from Koopur extends to the Pabur—are beautifully diversified with fields, thriving villages, and pine forests, chiefly of Kail, the only species at Deorah.

September 8th.—To Rooroo Kothee in four and three-quarter hours, called fourteen miles in the route book, but perhaps not above twelve. Soon after leaving Deorah, the road enters the domain of the Ranee of Syree, leading down over gneiss rock, along the left bank of the Beeskool river, which rises from the Koopur mountain. Its banks are regularly fringed with elder trees (*Alnus obtusifolia*) here called *Koonch*, the *New* of Kunawur. Saree is about half-way to Rooroo, and is the lair of an old Ranee, once famed for her beauty, and now for litigation with her neighbours, and oppression of her people. The old lady visited Calcutta about 1822, where I saw her on a visit to the late Sir Robert Stevenson. From near Saree, which is a poor hamlet, the Pabur river is first seen, with the Beeskool flowing into it, through some flat alluvial ground by Goonsa village. Across the Pabur, on a nearly isolated hill perhaps 500 feet above it, stands the fort or castellated mansion of Raengudh or Raengurh, once a Ghoorka, then a British post, and since ceded to the Rana of Kyoonthul in exchange for Simla. Far above the fort, from amidst a group of minor mountains of very picturesque outline, spring the richly wooded peaks of Boorhun and Godar Deotah, to the height of nearly 9,000 feet above sea level, a branch of the Changsheel—or as it is here softened, Chaheel range. The road descends by easy gradations to the level of the Pabur, and crossing the Nye, Noye, Pursrar or Dogra, a tributary from Thana Keeshain, continues along or near its right bank to Rooroo, a few hundred yards short of which, it crosses by a Sanga, or wooden bridge, a rocky narrow chasm, ninety-nine feet deep, through which flows the Shikree Nuddee. The Pabur is here a fine, strong, and perfectly clear river, occasionally forming formidable rapids. A species of trout is abundant in it and in the Shikree, but is said to be prevented by the snow water from ascending more than ten or twelve miles higher up. The cliff

section of the Shikree exhibits strata of a micaceous sandstone, but Rooroo, Chergaon, and several other villages on the Pabur, stand on elevated plateau of gravel and boulders, from 100 to 150 feet above the present level of the river. These are chiefly devoted to rice cultivation, for which this valley, here and upwards, known as Chooara, is celebrated; the fields are abundantly, and to the traveller often inconveniently, irrigated by rills skilfully led along artificial cuts from the Pabur, originating at a sufficient distance above to admit of the highest levels being watered.

Rooroo Kothee is 5,200 feet above the sea, and is rather a hot place. The barley ripens in the latter half of May, the wheat in the first half of June; the heat is then excessive. It is not a very large village, and has a kind of square in the centre, which, were it a little cleaner, would remind one of a substantial farm-yard in England. The Muhunt or Chief Gooroo of Busehur resides here, and has large endowments in land. Owing to the neglect of the smooth-tongued Mookheea of Deorah, who promised everything and performed nothing, our baggage did not arrive till sunset, so that our breakfast and dinner merged into one, at $\frac{1}{2}$ past 7 P. M., thirteen hours after leaving Deorah; a place which economizes cash better than temper. During the day, a general assembly of the mountaineers took place under the Gooroo's auspices, for the purpose of dancing round the gods. These, however well-gilt, appear to be aired and ventilated but once a year, and were deposited in litters beneath the trysting tree in the village square, round which the people formed themselves, men and women apart, into seven squares, single rank of eight or ten each, holding each other's hands, extended behind their backs: then by a curious and by no means inelegant step, or set of steps, in excellent time, they gradually completed the circuit, the movement being combined with others to the front and rear, with repeated bowings in concert to the deities; this continued the best part of the day to the music of pipe and drum, the performers being occasionally relieved from the surrounding crowd, all seeming equally adepts. Considerable practice must have preceded so creditable an execution of this dance, and once or twice the gods even joined in the fun, which then grew more fast and furious than ever; and from the exceeding elasticity of the ash-poles on which they were carried, "their worships" got such a shaking as gods in the plains can never hope to enjoy.

The mountaineers of the Himalaya, like those of Gilead, invariably convert the letter *s* into *sh*: so that the Shibboleth test must be reversed to detect a Paharee; they have also retained in common use a great number of Hindooee words, which are seldom heard in the plains.

Rooroo Kothee is situated about 150 feet above the right bank of the Pabur, which, at this season is fordable here with difficulty. In common with similar valley sites in the mountains, the village is infested with a small species of fly, which, without giving any notice, inflicts a bite that is frequently attended with much irritation. The higher mountains have also in the spring, their pest, in the shape of a large gad-fly, a pitiless enemy of man and beast.

The low glen of the Pabur, while it boasts abundance of the *Rosa brunonis*, *Indigofera dosua*, *Hypericum cernuum*, *Deutzia staminea*, and other flowering shrubs, possesses few or none of the beautiful herbaceous plants of the Alpine rocks and pastures. The *Marvel of Peru* (*Mirabilis jalapa*) however, grows in the greatest abundance and luxuriance about Rooroo and several other villages, as well as about Kotkhaee on the Girree, and on the outer range about Barh and Kalka; the climate of the Himalaya between 4,000 and 7,000 feet elevation, brings it to such perfection that in all these places it is so completely naturalized as to appear wild. Another American plant, the *Martynia diandra*, is equally abundant near villages in the Turree of Kemaon towards Bhumouree. The *Hypericum perforatum* is a common shrub in the cornfields of the Pabur and Girree vallies; and on the rocks near Rooroo and Deorah, I noticed the *Linaria incana*, resembling in habit the *L. cymbalaria* of Europe. *Desmodium tomentosum* is also a common shrub on the rocks in the Pabur valley hereabouts, and on the Sutluj above Wangtoo bridge, preferring the warmest exposures.

There is an interesting route of three marches, from Rooroo Kothee *via* the Shikree Nudee, and over the Moraul ka Dunda, to Rampore on the Sutluj, halting at Samurkot and Neura (or Neheree.) The country is well peopled, and beautifully varied with forest and cultivation. In May and June nothing can exceed the beauty of the wild roses, (*R. Brunonis*) climbing up the dark pines and alders, and falling down in splendid festoons of the most fragrant blossoms. Snow will be found early in June on this route, when the heat at Rampore, immediately below is almost intolerable.

September 9th.—To Chergaon, an easy stage of ten miles up the right bank of the Pabur, which we walked in three and a half hours. The current of the river becomes more and more furious as we approach its source in the Boorhun Ghatee; and in several places, dashes along with the greatest noise and violence amongst the granitic and other boulders, which lie in its bed.

“Vexed Scylla and the sea that parts
Calabria from the hoarse Trinacrian shore,”

are smooth water compared with it even in poetry; for it must be acknowledged that in reality these classic rapids are wonderfully calm and gentle. After a few miles, the road passes under a high range of slaty mountains of a curious formation, presenting an appearance more like a series of gigantic pine-apples or cheeses, than any thing else I know of. This is owing to the inclination and interruption of the strata, which on one side present steep faces of shattered rock, while the reverse side of the hummocks, though steep, is covered with grass. There are no trees on these mountains, exposed as they are to the withering influence of the southern sun; the *Desmodium tomentosum* is, however, abundant, and the *Capparis nepalensis* creeps in patches along the face of the sunny cliffs. About eight miles from Rooroo, we passed the village of Mundlee, held in free gift by Brahmans, but also inhabited by a colony of Moosulmans, whose ancestors emigrated here from Jounpoor, three or four generations ago. They still possess the true faith and a supply of fowls and eggs. This is properly the first village of Chooara. The land is here almost wholly devoted to rice, which will be ripe in October: till, koolthee, mash, &c. are still sown, but not in any quantity; and in spring, the poppy is rather largely cultivated. Across the river on a spur from the mountains stands the romantic fort of Butolee, near a large village called Musoola; above these rise the densely wooded flanks of the Changsheel range, facing the north, and in full contrast to the mountains on the right bank, covered with forests of pine (*Pinus excelsa*, *Abies smithiana*,) &c. Should the traveller prefer it, he may, if bound from Simla to the Roopin Pass, strike up from the glen of the Pabur at Raeengurh, and follow the summit of the Changsheel range to Doodoo. This route is much cooler and more interesting than that by Rooroo; but there are no villages, and two or three days supplies, a good map, pocket compass, and guides from

Mandil village, are indispensable. A little above Butalee, the Pabur receives on the right bank the Mutretee river, from the Moral ke Dhar, consisting of lofty, broken, glaxis-like ridges, the strata lying over towards the Sutluj, and probably rising to 13,000 feet. It is the continuation of the Shatool range, and divides Chooara from Dusao. By fording the Mutretee at a mill in the line of the Pabur, a considerable detour to the bridge up to its glen and a subsequent ascent of several hundred feet may be avoided; the short cut keeps close to the Pabur, but it requires a steady head to pass in safety some narrow ledges of rock, against which when the water is high, the current sets strongly, and none should then attempt it, who cannot depend on their nerves. On our return, the Pabur had fallen considerably, and we effected the passage without further inconvenience than what arose from the chilly waters of the Mutretee, which must be forded. About two miles on is Chergaon, a small and poor hamlet, about 6,000 feet above the sea, in the angle formed by the junction of the Undretee or Indravutee river with the Pabur. This impetuous torrent which is about equal in size to the Pabur, pours down south from the Shatool Pass; the bridge having been carried away, we were forced to cross its angry waters by a single tree, which my companion did unaided, while I was glad to accept the assistance of a neighbouring miller. Al-sirat itself could scarce be more narrow, or destruction more certain in the event of a slip. Chergaon is well supplied with apricot and other fruit trees, and the brink of the Pabur is shaded by alder, &c. The Toombroo peak, north of the Shunkun Ghatee, erroneously written Toongroo in the maps, is a conspicuous point from Chergaon down the glen of the Pabur.

September 10th.—To Moojwar village in Rol, twelve miles, a fatiguing march, during which we accompanied our coolies, who halted liberally to rest and smoke, so that we were eight hours on the road. For three miles the path lies through rice cultivation and brush-wood, up the left bank of the Undretee; then crosses and ascends about 500 feet to Dugol, a Brahman village of eight or ten families on the right bank, but in the map erroneously placed on the left. It is reckoned 6,800 feet above the sea, but the warm clothing of the inhabitants indicates a much colder climate than would be due to such an elevation nearer the plains. The holy fathers are small, well made, well clad men, but being afflicted with the itch, accompanied us to Rol for medi-

cine, of which, by the way, every traveller should carry a small supply to meet the demands, which will be almost daily made by patients suffering from liver, spleen, dysentery, and in short all the ills that flesh is heir to, save blue cholera; and if unflinching faith in the skill of the physician be conducive to a cure, the practitioner here should be successful indeed, for not *Æsculapius* himself was invested by the Greeks with more certain healing powers than is every European—however modest his pretensions in this department—by the mountaineers. From Dugol, the path again descends to the river, and for two or three miles keeps near its bank through beautiful English-like woods of elm, poplar, alder, cornel, (*Cornus macrophylla*) and birch (*Betula cylindrostachya*), with *Abies smithiana* on the heights. A little beyond Dugol, I found by a stream a species of *Eupatorium* in flower, much resembling *E. cannabinum*. We next recrossed to the left bank and followed it for several miles by a path often bad and rocky, and impracticable to ponies; the scenery is very wild and beautiful, the Undretee forming here, and indeed throughout the march, a series of foaming rapids: it is quite unfordable. We now once more recrossed to the right bank, and in a mile or two reached the junction of the two streams which form the Undretee—viz., the Byansoo from the left, the Sheear from the right, both flowing down from bare russet-coloured ridges, far above the region of forest, and evidently buried in snow for three-fourths of the year. The Byansoo, I believe, originates in the Jalsoo Pass, about 13,000 feet high, which affords a passage to Seran on the Sutluj. We finally gained the left bank of the Byansoo by a fallen spruce, and ascended the fork between the streams by a long and steep ascent to Cheechwar, one of the Rol group of villages, 8,600 feet above the sea, a pretty large and well-built place, one and a half or two miles above which, by an easy acclivity, we reached Moojwar. A blue aster, quite similar to the Swiss *A. alpina*; a large and handsome *Inula* by rivulets, (*I. royleana*?) the *Parochetus oxalidifolia*, the large-leaved elm (*Ulmus crosa*?) much like the Wych elm, here called Mored and Paboona, affording much fodder to the cattle, with the walnut, peach, and oak, (*Q. semicarpifolia*), are common in this district. Across the Sheear to the east, the mountains present a lofty precipitous front to the west, clothed with spruce and cedar. Across the Byansoo to the west are more bare, brown, and very rugged mountains. On the north, the Shatool is con-

cealed by rising land, but so far as one can see, the great range here is deficient in the magnificent cliffs and crags of the Roopin and other Passes to the eastward, but one is not yet high enough to judge fairly. Moojwar is about 9,000 feet above the sea; the houses large, of two stories, very substantially constructed of stone and timber. The cultivation is chiefly Bathoo (*Amaranthus anerdana*.) and Phaphur or Buckwheat, with a little tobacco. The climate is severe and capricious, and the people seem to consider the passage of the Shatool by no means a trifle, and, as we afterwards found, endeavoured to intimidate our people by the threat that not one of them would ever return; nor was a storm of rain and thunder in the afternoon, much calculated to encourage them. The villagers have, however, agreed to accompany us, and promised to have supplies for three days all ready in the morning. They are said to have been recently implicated in a foray on their neighbours beyond the next ridge whose sheep to the number of 1,500 they carried off after the manner of Rob Roy and his Caterans. There is *no king* in the land, and every man does that which is right in his own eyes.

September 11th.—To Kala Koondar, ten or eleven miles, which took us eight hours, being much delayed by the constant halts of the coolies, by my own rests and search for plants, and, after quitting the forest, by a very difficult path. The distances indeed are but approximations, and are perhaps exaggerated; experience has shown that to the direct map-distance about one-third must be added for the road-distance, instead of one-seventh as in the plains; but Kala Koondar, and the next two stages, being “*vox et præterea nihil*” are not inserted on the maps. Soon after leaving Moojwar, we passed the hamlet Jutwar, the last and highest (9,200 feet.) on the route. Brush-wood and meadows succeed, the first formed by *Rosa sericea* (a 4-petalled white species,) *Berberis brachybotrys* (with bright red fruit,) and abundance of the beautiful yellow *Potentilla dubia*; while the pastures abound with the sessile flowered *Iris kemaonensis*; all these plants are equally characteristic of the corresponding sites above Junglig and Jaka near the Boorun and Roopin Passes. The late Dr. Hoffmeister shewed me specimens of the above *Potentilla*, if they were not varieties of *P. atrosanguinea*, gathered at and above Chitkool on the Buspa, in which some of the petals were yellow and some carmine. On quitting the

meadows, the route enters and ascends steeply through a forest of *Abies smithiana*, *Pinus excelsa*, *Picea pindrow* and *P. webbiana*, *Quercus semicarpifolia*, *Taxus baccata*, *Ribes acuminatum* (red currant) the lemon-scented *Laurustinus* (*Viburnum nervosa*), *Rosa sericea*, &c., none of the trees remarkable for size. The *Picea pindrow* and *P. webbiana* are here and at Jaka, confounded under the name of Kulrai, perhaps the Chilrow of Royle, and these unconscious disciples of Lamark insist, that the difference in the size and colour of their leaves is solely owing to the inclemency of the wind and weather, on the exposed sites where the Webbian species is found. We emerged from the forest at a spot called Bhoojkal, 11,700 feet above the sea, and about three miles from Moojwar; the rest of the day's journey lies along the east or SE. exposure of the mountains, destitute of trees, but covered with a new and rich series of Alpine plants. A little beyond Bhoojkal and on the same level, Reonee, sometimes used as a halting place but a very bad one, occurs; and hereabouts much ground is lost by several steep descents to torrents by rather dangerous paths. Above, to the left, the mountains exhibit bare, but not precipitous shelves of gneiss rock, inclined from the route; to the right are deep glens, woods, torrents, and a few beds of snow, all wild, lonely, and sublime. Kala Koondar is an open but steep spot in a grassy, flowery glen, facing south, about 300 feet above the forest, and 12,000 above the sea, on a level with the Choor summit, which is visible to SSW. We encamped amidst heavy rain and hail from the north, which rendered the grass very cold and wet for our people and ourselves too, having been compelled for want of hands, to leave our charpaees on the road to-day. In these difficult tracts a good tarpaulin under one's bedding is much more conveniently carried than a bedstead, and excludes the damp almost equally well; where both are absent, a very excellent substitute is a thick layer of pine or yew branches.

The creeping juniper, here called Theloo but in Upper Kunawur Pama (*Juniperus squamosa*), commences from 800 to 1,000 feet below Kala Koondar. The open pastures are covered with a profusion of alpine flowers among which are the *Cyananthus lobata* (called Kheeree), the *Dolomicea macrocephala* (Dhoop or Googul), *Saxifraga parnassiæ-folia* (or a species very like it, also found on the Choor), and (on rocks) *Saxifraga mucronulata*, *Sieversia elata*, *Swertia cœrulea* and several other species, (one, a large plant with pale blue blossoms is probably

Royle's *S. perfoliata*), the *Sphelia latifolia* of Don, *Polygonum molle* (or *polystachyum*), *brunonis*, and *vacciniifolium*, (the last on rocks, a beautiful species), *Lonicera obovata*, *Senecio nigricans*, *Achillœa millifolia*, a yellow *Tanacetum*, *Oxyria elatior*, *Sibbaldia procumbens*, *Spirœa kamschatkika*, (very like meadow-sweet), several *Sedums*; *Morina longifolia*, *Caltha himalensis*, *Delphinium vestitum*, *Aconitum heterophyllum*, *Phlomis bracteosa*, *Corydalis govaniana*, *Geranium wallichianum*, *Picrorhiza kurrooa*, and many more. *Rhododendron campanulatum*, is common in the region of birch, and is called Chumreesh, Simreesh, Simrat, Simbur, &c.; and above it is the much smaller *Rhododendron lepidotum* or *anthopogon* with aromatic leaves, smelling when bruised like those of walnut; it is called Talsur. The capsules are in dense terminal clusters, and the flowers are said to be red. *Gualtheria trichophylla* with its beautiful azure fleshy calyx abounds on the sunny banks. The above are so general in all the region above the forest on the Snowy range, that it will be needless to specify them on every occasion. The *Cyananthus lobata* covers extensive tracts with its blue (occasionally white) periwinkle-like flowers; at and above Nooro Bassa on the north side of the Roopin Pass, I found the seed ripe on the 20th of September, while lower down, the plant was still in full bloom. In the same way, on the Changsheel Range, *Morina longifolia* was all ripe on the 25th September, while on the 30th, it was still in full flower on Huttoo. *Rhododendron arboreum* flowers in February and March at 7,000 feet, and is not ripe till Christmas; but *R. campanulatum* and *anthopogon* (*Talsur*) which flower in May, June, and July, at 12,000 feet, are ripe by the end of October. A strange alchymy of nature this, to ripen her products first in the colder sites, but perhaps necessary to the existence of plants in these elevated spots, where but for this provision, the early winter would prevent their ever coming to maturity. "Il est démontré (says the brilliant Frenchman,) que les choses ne peuvent être autrement: car, tout étant fait pour une fin, tout est nécessairement pour la meilleure fin. Remarquez bien que les nez ont été faits pour porter des lunettes, aussi avons nous des lunettes. Les jambes sont visiblement instituées pour être chaussées, et nous avons des chausses. Les pierres ont été formées pour être taillées, et pour en faire des châteaux, aussi monseigneur a un très-beau château; et les cochons étant faits pour être mangés, nous mangeons du porc toute l'année."

The *Dolomiœa macrocephala* is a very common plant in all the upper Himalaya : Royle's plate, perhaps for want of space, represents the leaves erect, which are naturally quite procumbent ; the root is highly valued as incense, and as such, is presented to gods and rajas. The *Picrorhiza kurrooa* grows abundantly on dry rubble from Kala Koondar to a great height on each side of the Shatool Pass, but I did not notice it elsewhere ; the root is excessively bitter, and is sold under the name of Kurrooa in the Simla Bazar ; it is the Kutkee of Kemaon.

September 12th.—To Doodach, eight or nine miles, which our coolies performed in four and a half hours. The route is much better and more easy than yesterday's, gradually rising over slopes, for the most part gentle, and crossing many rivulets from the left, some of them chalybeate. The banks of these exhibit in some places great walls of gneiss rock. The forest is now entirely lost sight of, and fuel must be brought in from Kala Koondar. Doodach is an open and level spot, well adapted for an encampment ; it must be fully 13,000 feet above the sea, and is probably identical with the Kuneejan, of Gerard. We had hard frost at night. The Undretee, a mere rivulet, rises in a bed of snow, a little higher up, and flows about 200 feet below us. Immediately above it, the opposite bank rises to a very great height, in a magnificent façade of bare gneiss cliffs, the ledges supporting deep beds of snow, and terminating to the north in a steep conical peak, called the Dhuneer ka Thood. From these crags several avalanches of rock fell down at night, with the noise of thunder. Between our camp and the base of the Pass (about a mile,) the rock is quartz, in immense *coulées* of shapeless masses, heaped together without order and very difficult to climb over. They have fallen from a huge and very curious rectangular mass, which forms the western side of the Pass. Several interesting plants abound here ; the *Saussurea* or *Aplotaxis gossypina*, clothed in dense wool, raises its conical form every where on the rocky rubble to the top of the Pass, resembling a vegetable spectre. It is called Kusbul, Munna Kuswal, and Bhoot-pesh, and is offered to the gods, who have evinced their care and favour by clothing it so warmly, exactly as they have protected the yak and alpine goat with a thick *waistcoat* of *pushmeena*. Another *Aplotaxis* is defended by a different contrivance ; the leaves are gradually converted into large yellowish transparent bracts, enclosing the colts-foot-like blossoms as

if in a head of cabbage. This plant is common amongst the large rocks from Doodach nearly to the summit of the Pass, and is also sacred. It is called "Birm (or Brem) Kounl (or Kouwul)," i. e. "Brahma's Lotus;" a similar species on the high mountains behind Cheenee, has a strong odour of musk.

Fraser found the "Birmah Counla" on the Bumsooroo Pass, between Sookhee and Jumnootree, and describes it thus—Stalk covered with large and long leaves, somewhat like those of a primrose, ending in a cup like that of a tulip, appearing merely the continuation of these leaves, closing and forming the petals of a very noble flower, in the centre of which the stamina and pistil are seen. Petals greenish towards the base, but the middle and higher parts are black and yellow, as is the centre of the cup, but more vivid. The latter part of the description appears derived from a *Fritillaria*, and very possibly from the same plant which, "Pilgrim" (pp. 66, 67) says is so beautiful at Kadarnath in April: and though growing on the hard ground and out of the melting snow, is called "Lotus." In Kemaon, the *Iris nepalensis* is known as the Neela Kumul, or blue Lotus; and is a favourite plant with fukeers, &c.

Amongst the other plants found at Doodach and on to-day's route were two species of *Aconitum*. One, which seems to be known as *A. dissectum* (*Hamiltonii* or *Speciosum*) abounds at this elevation, and has the leaves cut into five segments, with light blue blossoms. It is called here Doodhiya Moura, but in Kunawur, Tilia Kachung. The other species, *Aconitum ferox*, is called Moura-bikh, or simply "Mora" (from mri, to die,) and is reckoned extremely poisonous. It only occurred in one spot, a mile or two above Kala Koondar, growing in an extensive patch, the stems from four to six feet high, with long dense racemes of splendid deep blue flowers: the follicles three. The mountaineers were shocked when I told them that an equally deadly species was a favourite flower in our English cottage gardens, where they concluded it could only be planted in the view of occasionally getting rid of a superfluous boy or girl. The handsome *Ligularia arnicoides* (figured by Royle,) was in full bloom every where about and above Doodach, and in similar situations all over the Snowy and Changsheel ranges. On the south side of the Roopin Pass there is another species, with reniform leaves. By the rivulets on the route, and high upon the Pass, the *Primula stuartii* and *P. purpurea* are abundant, and now with ripe seed. They are both

called "Jy-be-Jy" or "Jyan," and are very ornamental in May, June, and July. With these occurs a very handsome species of *Dracocephalum* or *Lamium*, called Gurounta, with a strong camomile odour when bruised. On bare rocky ground from 12,800 feet upwards is found the *Centaurea* (*Aplotaxis*) *taraxicifolia*, the "Dhoopree," with heads of purple blossom and a delicious fragrance like that of the sweet colt's foot. The showy musk-scented *Delphinium* (*brunonianum*?) grows near the foot of the Pass, and is called "Soopaloo," "Ruskur," "Ruskachung:" it is, I believe, the "Liokpo," of Upper Kunawur, and is a curious illustration of the association in these lofty regions of musk in the vegetable as well as the animal kingdom. The *Hymenolæna* *Govaniana*, and several similar *Umbelliferæ*, with bracts greatly developed and beautifully fringed with white, are common, some of them attaining the crest of the Pass; among those lower down is one with decomposed leaves, of a strong aromatic parsley-like fragrance, here called Nesir, and mentioned by Fraser as occurring near Jumnotree, under the name of Mahee. All this lofty region (from 12,000 to 13,000 feet) abounds with the Kanda, a species of prickly *Meconopsis*, probably *M. nepalensis*, in form like Royle's *M. aculeata* (which in his plate seems too deeply coloured,) except that the flowers are of the most lovely azure. Amongst the Doodach rocks grows the *Sedum himalensis*, very like the *Rhodiola rosea* of England, and amongst the rocks and snow at the source of the Undretee I found the *Saxifraga granulata* of England, and a *Ranunculus* (*choorensis*?) much like the *R. glacialis* of Switzerland. Such are a few of the plants which "blush unseen" on these desolate wilds; a more leisurely examination would easily double the number. Nature, where she cannot be useful, seems determined to be ornamental, and converts these tracts where grain will not ripen, into pastures and flower gardens, where thousands of butterflies and insects enjoy their brief existence. The utility of nature must not indeed be limited to man, for there is scarcely one of these plants, the seeds of which do not support myriads of insects as well as many birds; and the highly successful experiment at Muhasoo is a sufficient proof that many of the forest tracts at least, and perhaps even the pasture lands above them might, by a moderate expenditure of industry and enterprise, be rendered available for the production of excellent potatoes, and thus enable the Himalaya to support

double or treble its actual population. Judging by the produce of the flocks and herds which now partly graze on these pastures, the soil and grass must be faultless; every traveller is struck with the quality of the milk—as rich as cream—at Rol, Jangleeg, and Jaka, placed at the lower limit of the belt where cultivation now ceases.

September 13th.—From Doodach over the Shatool Pass to Ateeng Wodar, twelve to fourteen miles, in somewhat under seven hours. An experienced native of Rol had earnestly advised us not to attempt the Pass unless the day were fine, and we were so far fortunate as to have a cloudless morning, and reached the summit, perhaps four miles, in three hours, mounting at a very easy pace; the ascent, indeed, is less fatiguing than that of the Choor from Seran; and on its completion we experienced none of those feelings of headache, giddiness, distress in breathing, &c., described by many travellers, and very sensibly felt by myself on a former occasion on the Roopin Pass. The route lies up over the frozen snow bed of the Undretee, and then up one steep continuous tract of broken, angular, masses of gneiss rock, of which there is a steep escarpment to the right, capped by a thick bed of the purest snow. The *col*, or semicircular summit of the Pass, is in its whole extent furnished with numerous piles of stones called Shoogars or Thooas—the “Ebenezers” of grateful and successful passengers; in number and height far exceeding those on the Roopin and Boorun Ghatees; the pillars being apparently in a direct ratio to the piety and the fear of the passengers, and the difficulty and danger overcome. Our men had provided themselves with stores of flowers, chiefly the Kounl and Munna-kuswal saussurea, and the musk larkspur, which they tied in long garlands, and with which they decorated, first the pillars, and then, on the Hindoo principle of “Purmeshwur-hai,” ourselves. They clearly fancy their gods to be as fond of musk as they are. On so cold a site, a few faggots of wood would be a more rational offering; but as their evil genii and demons are lodged in eternal fire, it is quite logical to locate the gods in eternal cold and snow, and it is remarkable that he who was prophet at Medina, and impostor at Mecca, also patronized this notion, for he affirmed that, when touched by the hand of Allah, the sensation was that of intense cold. On our return by the Roopin Pass, the garland ceremony was dispensed with, each man merely tearing a small portion of his clothes, and suspending it on the pillars, a custom

universal in these mountains, where we observe a bush or tree on each more eminent pass, ornamented with votive rags of all colours, precisely similar to those about holy wells, &c., in Ireland. With respect to vegetation, the *Primula purpurea* and *Sibbaldia purpurea* grow very high upon the south side of the Pass; the two *Saussureas*, a large *Sedum* (probably *S. asiaticum*), a *Rumex*, and a pretty pink *Corydalis* (either *hamiltonii* or *meifolia*) reach the crest; and *above* that of the Roopin, I found patches of *Potentilla inglesii*; so far are these elevated ridges from being entirely forsaken by Flora!

The right or eastern portal of the Shatool Pass is formed by the pinnacle of rock, 1,500 feet high, and 17,000 above the sea, visible from Doodach; it is called Dhuneer ka Thooa (the Dunerko of Gerard,) from the Mookheea of Rol, who bribed a bold adventurer with a hundred rupees to scale it, and erect a pile of stones in honour of the Deotahs and himself. Moore tells us, that the schoolmen used to debate how many angels could dance on the point of a needle without jostling each other; and some of these Himalayan needles are so sharp, that the same question naturally suggests itself with respect to the thirty million of gods which the Hindoo Mythology has peopled them with. The Dhuneer ka Thooa sends down to the north a broken serrated spur, which falls to the west in a lofty and most superb escarpment of naked rock, which lay on our right as we descended. Looking down to the north, through the long vista of the glen, we had a glorious though somewhat limited view of the lofty peaks of the snowy range beyond the Sutluj, separating the Busehur district of Wangpo, north of the Wangtoo bridge, from the districts of Manes and Dunkur, in Speetee, and crossed by the Taree Pass, 16,400 feet above the sea. In some of our maps this range, or its outliers behind Kanum and Cheenee, is called the Damak Shoo, probably from the prevalence of the *Damak*, or various species of *Astragalus*, *Caragana*, &c. which grow there, and which our travellers in Upper Kunawur call Furze.

The Shatool Pass is 15,550 feet above the sea level, nearly 100 feet below the top of Mont Blanc: and was first crossed in June 1816 by General Hodgson. It is distinctly visible about E. 24° north from the top of Jaka at Simla, a degree or two to the left of Colonel Chadwick's house on the Muhasoo ridge, lying between two of those conspicuous inclined peaks of which the rocky planes slope down to the east and

ESE. at angles of from 10° to 20° , considerably to the right of the three-grouped and similarly inclined peaks, often but erroneously pointed out as the Boorun Pass. It is owing to this conformation of the strata that the routes up the vallies near this portion of the Snowy range invariably keep to their western and SW. sides; on the opposite ones, the strata "crop out" in inaccessible crags.

Beautiful are the "balancings of the clouds" at this and the past season in the Himalaya, and the endless variety of light and shade, which they cause on mountain, forest, field, rock, and meadow. No sooner has a shower fallen, and the sun shone out, than the process of evaporation commences in the heated vallies; the rising vapours are condensed at a given elevation into clouds, which, with a snail-like movement, creep up the mountain sides, and invest the summit or languidly tumble over the ridge into the next valley; "even in their very motion there is rest." Occasionally an entire valley or large tract of the mountain is covered with one fleecy mass, on which the spectator looks down as on a sea, a lofty peak here and there jutting up like an island. It must be confessed, however, that they are best at a distance and in poetry. Disagreeable at Simla, they are dangerous on the Shatool, where we had not been above half an hour, on the narrow crest, when from the south, clouds

"Rose curling fast beneath us, white and sulphury,
Like foam from the roused ocean of deep hell,
Whose every wave breaks on a living shore,
Heaped with the damned like pebbles!!!"

The wind also being very keen, and our only seat the snow, we effected a speedy retreat down the great northern snow-bed, of which we only reached the termination in an hour and three-quarters. The upper portion had been covered to the depth of two or three inches by a recent fall. To this succeeded a wearisome and, in many places, very steep and difficult *moraine* composed of enormous sharp, shapeless, fragments of gneiss piled on each other in wild confusion, the lowest ones resting on frozen snow. These would indeed prove "destruction's splinters" to the unfortunate, overtaken here by a snow storm, which would paralyse his hands and feet, and blind his eyes—all most essential accessories now; and accordingly this was the scene where Dr. Gerard in September 1820, had two of his people frozen to death at midday, and escaped

himself with great difficulty and the loss of all his baggage. In no month is the passage perfectly secure. It is effected with least difficulty early in spring, as the snow then covers all the rocks which so much impede one's progress; but I am not aware that the natives ever attempt the Shatool till the rains have set in; and even on the other Passes clear and perfectly *calm* weather is indispensable to safety.

The scenery on the northern declivity is wild and savage indeed: to the right are the magnificent black cliffs before mentioned, which, from the summit, slope back gently in great fields of snow, of the most dazzling whiteness; deep beds also lie at their base. To the left the mountains are more bluff and rounded but still greatly shivered. The Moraine ends to the north in a steep escarpment, and latterly our route over it, lay on the ridge of a very curious *bund* of snow, rubble, and rocks, about sixty feet high, and very steep on both sides, and apparently artificial as any railway embankment. Except that frozen snow is substituted for ice, the whole scene greatly resembles the Mer de Glace, and other glaciers of Savoy and Switzerland. A turbid stream issues from the base of the great snow-bed, and is joined by several torrents from the left; the combined stream a little below flows placidly for a while over a nearly level dale. During the day time the powerful rays of the sun melt the whole surface of the snow beds, and these torrents become unfordable: but at night, when all is re-frozen, they are dwindled to mere rivulets, only supplied from the bottom of the snow-beds being melted by the heat of the earth, and hence they are easily crossed in the morning. Below the moraine, the mountains rise steeply on each side, covered, especially on the left, with grass and herbage, now of a rich raw-sienna tint forming a strong contrast with the great beds of white-quartz masses, which on this side extend down to the valley, reflecting a most intolerable glare. The path, a very narrow and bad one, finally keeps close to the left bank of the stream, and so continues to Ateeng Wodar, a summer station for shepherds, equivalent to the *chalets* of the Alps, except that the Himalayan mountaineer is generally content with the shelter of a cave in the rocks, sometimes a little improved by a rude wall in front. Ateeng is nearly in the latitude of Rampoor, a short distance above the birch forest, about 12,000 feet above the sea, and perhaps nine miles from the crest of the Pass. The valley is narrow, and destitute of the savage features it possesses above,

but across the torrent to the east, the mountains are still very steep, bold and lofty, with many deep ravines filled with snow.

The vegetation consists here of *Delphinium vestitum*, *Dolomicea macrocephala*, *Cyananthus lobata*, *Onosma bracteata*, aromatic rhododendron, and *Cassiope fastigiata* ("Talsiree") the "heather" of Fraser; with it grew a shrub with all the appearance of a *Vaccinium*, but with neither flowers nor *fraochans* to enable one to decide. Between Ateeng and the moraine, the *Salix lindleyana* creeps abundantly on the ground, and Royle's *Arenaria festucoides* is not uncommon; on the moraine itself was a plant very like his *Saxifraga imbricata*, abundance of *Ranunculus choorensis*, and one or two *Gentians*, in flower. These mountains no where exhibit the carpet of blue *Gentians* and *Campulas* so lovely in the Alps. On the gravel beds and banks of the stream, the *Epilobium speciosum*, perhaps the finest species of the genus, grows in abundance.

The chief reasons for the Shatool Pass being so much dreaded are first—the intrinsic difficulty of the northern moraine, as well as the descent from Ateeng to Panwee, where the path is so narrow that even laden sheep pass with some risk: and secondly, the remoteness of supplies, fuel, and places of refuge. The Roopin and Boorun Ghatees have each a village within one stage of their southern base, and on the north, the valley of the Buspa is easily gained in one day by tolerable paths. Laden men cannot reach the Shatool from Rol in less than two days; and at Ateeng Woodar, on its north side, they are still distant a very hard day's journey, by an execrable path, from the valley of the Sutluj.

September 14th.—From Ateeng Wodar to Panwee, near the Sutluj above Wangtoo bridge, a distance which we estimated to be sixteen or seventeen miles, with a descent of 6,000 feet; a very fatiguing march, which we walked in eight hours, inclusive of several halts. In the contrary direction, it would indeed be a tremendous journey, and should be divided by all who travel for pleasure or profit. The route, by a bad pathway, gradually rises along the Alpine pastures, occasionally traversing a dense coppice of *Rhododendron campanulatum*, *R. anthopogon* (or *lepidotum*, the aromatic species) and mountain ash (*Pyrus foliolosa* or *ursina*.) the latter in full fruit, the berries occasionally of a beautiful waxy white, a variety probably of the usual red-fruited species,

which I have also received from the Harung Pass above Sungla. It forms a favourite food of the bears which are numerous hereabouts. Mingled with and below the Rhododendron and mountain ash to the right, are extensive shaggy woods of large white-barked birch (*Betula Bhojpatra*,) recalling many a romantic spot in the Trosachs, Glengariff, and Capel Carrig. The bark consists of as many as twenty layers, and is much employed in Kunawur in the flat roofs of the houses, where it is laid under a stratum of clay. Supposing the Himalaya to have emerged gradually from the ocean, this "tree of knowledge" may be held the last best gift of heaven to man in the vegetable way, for it could not exist till the mountain had attained an elevation of 9,000 or 10,000 feet; the silver fir, (*Picea webbiana*) must be nearly of the same age, and thus we may form a comparative chronology of the dates at which the various trees were successively produced. Quitting the birch braes, we encountered a steep ascent under fine gneiss crags and pinnacles, with tremendous declivities on the right hand, which brought us to the crest of the Ootulmai Ghatee, (called Gongrunch or Shaling by Alex. Gerard,) where the path turns to the left, and leaves the Shatool glen. Hence to Panwee is one almost unintermitted and generally extremely steep descent for a few hundred feet, over loose rugged rocks, covered with the large and now scarlet leaves of *Saxifraga ligulata*, and then through a superb forest of *Picea webbiana* and *Quercus semicarpifolia*, both streaming with long white lichens, also birch, and a dense underwood of mountain ash, *Rhododendron campanulatum*, *Rosa webbiana*, *Syringa emodi* (Lilac,) black and red currants, yew, &c. At the bottom of this glen, perhaps a mile down, we reached a small romantic dell, through which flows the Skooling or Shaling stream, and here the scenery is of a Titanic grandeur and wildness. On all sides, feathered with the dark silver fir, vast precipices spring up perpendicularly, and seem utterly to preclude further progress; it seems as if one had reached the gates of Hades. On the brink of the stream the Greek Valerian (*Polemonium cæruleum*,) and the lovely azure blue hound's tongue (*Cynoglossum uncinatum*,) were flowering in abundance. God might have made a more beautiful flower than this last, but he never *did*, as some one has justly observed of the strawberry as a fruit. Exit from this spot seems as impracticable as from the happy valley of Rasselas, and is only obtained by a short

sharp clamber, which introduces the wayfarer to the Panwee Dhunka, a distance of three miles, the most dangerous I ever traversed ; the path so called, being excessively narrow, and carried along vast ledges of rock, inclined at a high angle to a bottomless pit on the right, from which they rise at an equally steep angle on the opposite side. I cannot recollect such enormous shelves of rock elsewhere, nor, except the Via Mala on the Splügen road, and the gorge of Gondo on the Simplon Pass, an abyss more profound. Neither of these, however, can compare with the Panwee ka Dhunka in the extent and luxuriance of forest, which here clothes the mountains above and below, to the right and to the left. The Skooling falls in a fine cascade down to the right at such a depth, that one can scarce bear to glance at it, save from such "coigne of vantage" as a tree growing from the cliffs. "The least obliquity is fatal here," and no one should attempt the passage who is not well assured of his nerves, or weary of his life. Bossuet has a passage so eloquent, and so apt to such a situation, that my readers, if any, will be pleased at its insertion here.

"La vie humaine est semblable à un chemin dont l'issue est un précipice affreux. On nous en avertit dès le premier pas : mais la loi est portée, il faut avancer toujours. Je voudrais retourner en arrière : Marche ! marche ! un poids invincible, une force irrésistible nous entraînent ; il faut sans cesse avancer vers le précipice. Mille traverses, mille peines nous fatiguent et nous inquietent dans la route. Encore si je pouvais éviter ce précipice affreux ! Non, non ; il faut marcher, il faut courir ; telle est la rapidité des années. On se console pourtant, parce que de temps en temps on rencontre des objets qui nous divertissent, des eaux courantes, des fleurs qui passent ! On voudrait s'arrêter : Marche ! marche ! Et cependant on voit tomber derrière soi tout ce qu'on avait passé : fracas effroyable ! inévitable ruine ! On se console, parce qu'on emporte quelques fleurs cueillies en passant, qu'on voit se faner entre ses mains du matin au soir, et quelques fruits, qu'on perd en les goûtant : enchantement ! illusion ! Toujours entraîné, tu approches du gouffre affreux : déjà tout commence à s'effacer, les jardins moins fleuris, les fleurs moins brillantes, leurs couleurs moins vives, les prairies moins riantes, les eaux moins claires ; tout se ternit, tout s'efface. L'ombre de la mort se présente ; on commence à sentir l'approche du gouffre fatal. Mais il faut aller sur le bord. Encore un pas : déjà

l'horreur trouble les sens, la tête tourne, les yeux s'égarerent. Il faut marcher : on voudrait retourner en arrière ; plus de moyens : tout est tombé, tout est évanoui, tout est échappé !” and it was our fate to escape these very literal precipices by an abrupt descent to Panwee, all through a dense and lofty forest, excepting the last 500 feet, which lead to the village through terraced cultivation. The forest trees occur in the following descending order—*Picea webbiana*, first alone, and then mixed with *P. pindrow* and *Quercus semicarpifolia* ; then *Abies smithiana* and *Pinus excelsa*, many of the latter fully 150 feet high. Lastly, the cedar feathers all the bold crags about the village, which across the Skooling torrent to the east rise precipitously into a lofty peak, arguing no easy marches ahead.

We encamped by a temple where our people found excellent shelter from the brisk showers which fell in the afternoon. A thick bush of sacred juniper grows in the enclosure, and the vicinity is well shaded by horse chestnut (*Pavia indica*), elm, peach, apricot, walnut, and mulberry trees. Panwee is a middling-sized village, above the left bank of the Skooling river, two or three miles from Wangtoo bridge, and from 1,300 to 1,500 feet above it. From several points above the village, the Sutluj, with the road to Chegaon, is visible ; as well as the wild glen of the Wungur, which joins at the bridge in one succession of cataracts. By visiting Panwee, we have enjoyed some of the sublimest scenery in the world, at the expense of a stage on our way to Sungla, for the direct route follows the Shatool stream to Melum, but our guides were, or pretended to be, unacquainted with it, and on enquiry here, we found that it is really impracticable to men with loads ; and have every reason to believe it must be extremely difficult without that encumbrance.

September 15th.—To Melum or Ramné (the Melung of the map), about ten miles in seven hours, by a difficult route, the path being for the most part as rocky, and in some places as dangerous as any we have traversed. At one almost impassable ledge, one of our dogs fell and had a narrow escape. (By the bye, dogs should not be brought into these parts—being perpetually in the way, to the risk of their own and their master's necks.) In several places jutting crags are only passed by the aid of the ladders, scaffoldings, and steps, so familiar to the traveller in Kunawur. On leaving Panwee, there is a steep declivity to

the torrent, which here forms a pretty cascade, as does that under Melum, about a mile short of the village. The vegetation here consists of rank grass, reeds, &c. Hence there is a considerable ascent to a point affording an interesting view of the Sutluj, and its picturesque rocky gorge where spanned by the Wangtoo bridge. Our path then led us down to the left bank of that river, now rolling along an impetuous torrent of milky water. A long ascent succeeds, with the river from 300 to 1,500 feet right below; and above us to the right hand long craggy façades, bristling with cedar which abounds hereabout. The road to Cheenee lies down on the opposite bank of the river. From the brow of the last ascent our path turned to the right up the glen of Melum, and met the Shatool Pass torrent in about two miles, where it has deposited an immense accumulation of drift timber, the spoils of the forests above. The trees on its banks here are chiefly *Alnus obtusifolia*, *Rhus buckiamela*, and *Spiræa lindleyana*. A gentle ascent of about a mile and a half brought us to Melum, also called Ramné, a small but well built village, about 7,000 feet above the sea, standing on a plateau, closely backed by steep woody mountains. By avoiding the last steep ascent to-day, and keeping direct on to the mouth of the Melum river, we might perhaps have reached Keelba; but the gentlemen and ladies who carried our baggage assured us, we should repent if we tried the very bad ascent from that stream.

September 16th.—To Keelba, about nine miles, which from the excessive ruggedness and difficulty of the worst path in the world, and its manifold steep dips and rises, we only accomplished in five and a half hours. First we descended to, and crossed a torrent below Melum, and then mounted by Yana or Janee village, till we came abreast of Chegaon or Toling, and on a level with it, 7,225 feet above the sea. It consists of a group of villages, with several large temples and extensive cultivation. On the crags at this point, I noticed the *Incarvillea diffusa* of Royle, an elegant plant which is also found on the Wangtoo rocks. Hence the path falls to the Sutluj, and leaving Poonung above to the right, continues along its brink for a few miles over boulders, gravel, and sand, overrun by a shrubby, silvery, and very aromatic *Artemisia*; the river is fringed by the “Wee,” a species of olive, probably *Olea ferruginea*. The toom or ash, *Fraxinus xanthoxyloides*, is common, but of no great size. It is frequently met with in the higher parts of

Kunawur, and is known about Rampoor, as the Gaha or Ungah. The very jaw-breaking specific name is very justly applied. The *Daphne mucronata* of Royle here becomes a common shrub, called jeekoo; and near Yana, I first met a species of *Celtis*, called koo, of which the drupe, now ripening, of the size of a small cherry, is sweet and edible. There are two species or varieties; one a large tree called Ro-koo, with black or dark purple fruit; the other, Cho-koo, smaller, has yellow or orange fruit. This, and not *Elæagnus*, as surmised by Royle, I take to be the "red and mawkishly sweet berry," produced on a shrub in Hungrung, as mentioned by Herbert (*Asiatic Researches*, XV. 392.): as his "yellow and acid berry about the size of a currant," is no doubt the fruit of the Soorch (*Hippophæ salicifolia*). The Koo is pretty common nearly up to Brooang, at Meeroo, &c. It has been mentioned to me by a friend as occurring under the name "Kaksi" near Jungee, where, however, a subsequent enquirer could hear nothing of it: in all likelihood because the first had been misinformed as to the name; "Kagshee" being the *Cornus macrophylla*, which has a *leaf* like the *Celtis*. Both the *Celtis* and the *Zizyphus* have been identified with the famous lotus of the Lotophagi; but assuredly one may devour any quantity of Koos or Bers, without risk of forgetting one's home and friends. A little below Panwee, and generally up the left banks of the Sutluj and Buspa to Brooang, at an average of 6,000 feet, there is abundance of a species of oak, which I have not met elsewhere, though it seems to be the *Quercus cassura*, of Don's *Prodromus*. The leaves are exceedingly waved and spinous, tomentose below (as are the cups of the acorns, which are produced by six to eight) or solitary, on spikes or peduncles of five or six inches. They are now nearly ripe. The tree is called "Bré," but this seems to denote the genus only. *Pinus gerardiana* is pretty common, but not very large on the crags, during this day's journey:—and in the coppice, *Abelia triflora* occurs abundantly, here called "Spung:" the "Takla" of Bulsun and Bhujee.

From the river-bank, the path now ascends for two miles or so, to a few hundred feet above its level: another rainy season will, to all appearance, render it impassable, and it is now as dangerous as can well be imagined, crossing a vast landslip with a most precarious footing on loose sand and rocks, highly inclined, where each step receives and requires more deliberation than an act of Parliament.

What has been done once may be done again, but no reasonable man would attempt this a second time. The reward consists in the view of the river, here not above ten yards over, "a hell of waters" rushing on, like Pyriphlegethon, in perfect cataract, boiling, foaming, and tossed up vertically in one continuous mass of spray in its ungovernable career, amidst immense boulders, and under the tremendous precipices of the right bank, which it seems bent on undermining. What an antithesis between its recent quiescent state and gentle fall as ice and snow, and this unruly turbulence, and then its almost stagnant course onward to the ocean, where it enters on its final probation as vapor, realizing the hell imagined by Shakespeare :—

" To reside
In thrilling regions of thick-ribbed ice;
To be imprisoned in the viewless winds,
And blown with restless violence about
The pendent world."

Above this, the river receives an affluent from Meeroo, and on an isolated rock, just above the junction, stands the Raja's Castle of Choling, the Chalgee of the map : still higher up, the Channel widens, and the river flows with a strong uniform current, bounded by a broad bed of shingle on its right bank. The Sutluj may here be said to effect its passage through the great range, and, generally, the traveler cannot fail to be surprised at the manner, almost resembling instinct, in which the river finds its way through such a labyrinth of mountains. It has here indeed followed the natural line of a vast echelon formed by the Shatool ranges to the south, and those of Speetee and Koolloo to the north : and from the Thibet frontier at Shipkee to Rampoor has an average fall of sixty feet per mile. The absence of lakes, and the existence of so general and efficient a system of natural drainage seems to argue the vast antiquity of the Himalaya, and may also serve to establish Lyell's theory of a gradual upheavement of mountain chains, which afforded time for the water to adjust their levels ; and to fill up the basins with those deep deposits of gravel and boulders, through which they are so often found to excavate their beds. The planes are indeed still far from uniformity ; and the roar of the torrent and the cascade, the sound of many waters, is rarely out of our ears as we approach the higher mountains.

From the rapids of the Sutluj an abrupt ascent of several hundred feet leads to the cultivation, chiefly buck wheat, and finally under vineyards, to the romantic village of Keelba, situated immediately above the river, surrounded by great numbers of fine peach, apricot, walnut and elm trees; while some superb weeping willows flourish by the beautifully clear rivulets which gush down on every hand from the lofty mountains to the south. These are densely wooded, and shew a front of splendid precipices to the north or north-west, ending in a high bluff of rock, which seems the "Yana Bul" of the map. Seen from near Meeroo across the river, the appearance is as if a great tract of ground had here subsided, having a high wall of rock on one side, reaching up to the Snowy range near the Boorun Ghatee. Meeroo itself is hidden from Keelba, but the neighbouring village and cultivated slopes of Oorinnee, 400 to 500 feet above us, are visible to the north-west; and to the east, the snowy peaks of the Ruldung just come into view. The grapes here and at Brooang, &c. have totally failed this year, probably from the prevalence of unseasonable rain, which fell in drizzling showers to-day and yesterday, but cleared up this afternoon. At Melum, a good room was placed at our disposal, with a second for our people: and we have the same advantage at Keelba.

September 17th.—To Brooang, Booroo, or Brood, eight or nine miles. We marched at 20 minutes to 8 A. M. and descended to the Sutluj, which here flows in a broad and comparatively calm stream: the path generally bad, lying up and down the crags, which are finally wooded with ash, olive, and neoza pine (*P. gerardiana*.) At half past nine we reached the confluence of the Buspa, which flows into the Sutluj like a mill-race, and is equally muddy, marking its source in a granitic tract. "Pilgrim" attributes the turbid waters of the Neelung to its source amongst mountains of slate clay (p. 33.) but on inspection of the Ruldung cluster, which may be called the cradle of the Buspa, with its great scars and flaws of whitish granite, induces me to conclude that the discoloration is due to the decomposition of this rock: it is exactly the same with the Arveron at Chamouni. The bluff crags and cliffs, feathered with cedar, and the twisted neoza, are very grand where the rivers unite: the Sutluj comes down through a narrow rocky gorge, a little above the point of confluence; a good Sanga, 5,968 feet above the

sea, is thrown across the Buspa, for the Pooree and Cheena road; but our route lay up the rough, stony path on the left bank—the river a perfect torrent, in a very deep confined gully, where the channel is choked by huge boulders. At the fifth or sixth mile, we should have quitted the gorge, and ascended to Brooung: but we had loitered behind the coolies, and proceeding to the Brooung stream, were in full route to Sungla, when we fortunately met its Mookheea on his way to Ralee, who shewed us our mistake, and directed us back up a steep ascent of about 800 feet, where we lost our way again in a wilderness of fruit trees, and got at least 500 feet above the village, which, after two hours' wandering in complete uncertainty, we at length hit on quite accidentally. It is a poor scattered place, just above the left bank of the stream from the Boorun Ghatee, the snows and peaks of which are seen above: the inhabitants are a meagre, sickly race. It seems to be the place called Soorung, in the trigonometrical map—one of its manifold errors in typography. The elevation is generally given 7,411 feet, but in a German map, published at Berlin, it is stated to be 8,820 feet, (Paris) or 9,400 English, which is certainly too much.

On rivulets flowing into the Buspa, I noticed to-day a species of *Tussilago* (colts-foot) with the habit of *T. petasites*; it is said in May and June to produce fragrant yellowish flowers. With it grew the *Polygonum runcinatum* of Don's *Prodromus*.

September 18th.—From Brooung to Sungla, about twelve miles, in seven hours. For half this distance the path rises and falls along the left bank of the Buspa through beautiful scenery, the precipitous rocks feathered with the neoza pine, here generally called Shungtee and Ree. The course by the river then becomes impracticable; and a steep ascent of 2,000 feet succeeds nearly up to Chansoo, with a line of stupendous precipices to the right, the pents and ledges of which are clothed with splendid cedar and kail (*Pinus excelsa*), many of the latter not under 150 feet in height. To the left, the Buspa rages in a series of cataracts through a tremendous abyss, which succeeds its comparatively level course over the Sungla valley. Boisterous indeed is the career of this aquatic Richard: its average fall being 250 feet per mile. The brink and face of the steep on this side is fringed with many superb old tabular-headed cedars, their gigantic boughs thrown about in wild disorder, like Lear, with outstretched arms, appealing in vain to the unpitiful heavens.

The tree constantly prefers the steepest acclivities, a peculiarity which must be respected by those now trying to naturalize it at home: it will infallibly perish if planted in any ground approaching a swamp, a condition unknown to the Himalaya. Near the foot of this ascent there is a *dogra* or hamlet, belonging to Chansoo, with orchards of apricot, walnut, and peach trees, of which last the very abundant fruit was sweet and juicy. The people and the bears divide the prize; the former securing their share by day, which is dried in the sun for winter consumption. The bears, who are said to be very numerous, devour their portion by night. Chansoo is 9,174 feet above the sea, and is a most lovely and picturesque spot; the continuation of the cliffs before mentioned, extending behind it in a lofty amphitheatre, the brow of which is clothed with birch, now falling into the sere and yellow leaf of winter. The fields of Chansoo are shaded by very large walnut and cedar trees: we measured an elm twenty-nine feet round, at five from the ground. From Chansoo there is a route via Soang or Sheong, (9,000 feet), over the Sheoo Ghatee, (13,350 feet), to Paneemor and the Boorun Ghatee. It is very interesting from its carrying the traveller amongst the most splendid cliff-scenery: and from the summit of the Sheoo Ghatee several shadowy ranges, covered with snow, are seen to occupy the horizon from north to north-east—the far away mountains of Ladakh and Thibet.

Our descent towards Sungla was amongst huge detached masses of gneiss, and at about one-third the height ascended, we again reached the Buspa, no longer roving like a maniac in a strait waistcoat, but flowing rapidly, and frequently in three or four streams, along the open valley of Sungla: Kumroo, the old capital of Busehur, is seen across the river, and elevated several hundred feet above it: it is about a mile from Sungla; the intervening tract being a high plateau, a forest of fruit trees. The rajas found themselves Tartar up here, and determining to become Hindoo, removed to Rampoor, as—*parvis componere magnis*—Peter the Great left Asia and Moscow for Europe and Petersburg. The banks of the Buspa are here fringed with the willow and “Soorch,” (*Hippophæ salicifolia*); and in three or four miles from Chansoo, we crossed to the right bank by a good Sanga, immediately under the village of Sungla, close to which we encamped, by a temple adorned as usual in these parts, with many heads and horns of wild sheep, deer, &c. Some of them belonging to an animal called kin, skin, or sikeeng, are of

monstrous dimensions. The very general practice of decorating the temples (not of the men but) of the gods, with horns, which prevails even amongst the Mohammedans of the Hindoo Koosh, reminds us of the expression—"horns of the altar"—among the Jews, as well as of the altar of Apollo at Delos, which is reported to have been wholly formed of them. There is perhaps a reference to the rays of the sun, which are denoted in Hebrew by the word Kiran, which also expresses horns; hence, when it is said "Moses' face shone," the Vulgate chooses to render it—"was horned;" and the Italian painters have ever since represented the prophet with horns just as Alexander the Great ("Dhul," Karnein) wears them in right of his father Jupiter Ammon. The sun would naturally play a prominent rôle in the primeval worship of the Himalaya, and I remember once at Paikhā, on the upper Pabur, when marking out a short vocabulary, having "Purmeshwur" given me as the name for the sun: a significant commentary on the Gayatri!

Sungla is rather a large village, built on a slope facing the south-east, about 150 feet above the Buspa, and 8,600 above the sea. There seems no medium in the looks of the inhabitants, who are either very handsome or very ugly. Of the extreme beauty of the valley there can be but one opinion: the river flows swiftly down the centre over gravel and stones; above this, on plateau of various levels, is an abundant terraced cultivation of cheena, bathoo, tobacco, kodah, and the beautiful buckwheat, diversified by occasional woods of cedar, poplar, and the usual fruit trees, irrigated *ad libitum* without labour; the difficulty in the hills being to level the ground, and in the plains to water it. To the south the base of the outer Himalaya is sloping and verdant, with woods of cedar and koil firs: and immediately above the valley to the north-east, rise the enormous bare, grey, rocky scarps and pinnacles of the Ruldung group, with considerable snow beds wherever the slope allows, and still resisting the force of the southern sun. This magnificent group extends far up the Buspa towards and beyond Rukchum, above which a single pyramid of rock springs up nearly to the height of the loftiest peaks behind Sungla, 21,500 feet: but to see the valley and its setting in all its perfection of pinnacle, crag, and fields of the purest snow, one must mount to the highest hamlet towards the Roopin Pass. The scene strongly recalled Chamouni to my mind: the Buspa enacts the Arve well, and in each situation the mountains actually rise

about 13,000 feet right above the spectator. Seen laterally from Cheenee at only seven miles distance, the Ruldung presents the additional feature of dark and extensive forests, and the sharp needles are there mingled with long dome-shaped ridges, all invested in perpetual snow, from which, in June and July, is heard the frequent crash of the avalanche. "Ruldung" is the Kunawuree name for Muhadeo, who resides here, as Jove

‘ On the snowy top
Of cold Olympus ruled the middle air,
His highest heaven.’

The legend is, that Ruldung is a chip of the true Rylas near Mansorowur, brought here at the desire of an ancient king and penitent: and it is considered meritorious to perambulate the mountain, keeping it always to the right hand, exactly as the cairns, &c., are circled in Scotland and Ireland, and for the same reason, i. e. because the sun goes round the earth in this direction.* Amidst all this superstition, the sublimity and immaculate purity of the Ch’hota Kylas render it no mean emblem of "the high and holy one that inhabiteth eternity;" and we may quote with admiration, if we do not adopt with conviction, the lines of the poet, written under the inspiration of similar scenery—

‘ Mighty Mont Blanc ! thou wert to me
That moment with thy brow in heaven,
As sure a sign of Deity
As ere to mortal gaze was given, &c.’

There does, indeed, appear to be both benevolence and design in the existence of these great mountain chains, and we may consider the Himalaya as nature's vast reservoir for the irrigation of empires; opened every spring by Phœbus Apollo, when like Amram's son, he ascends from the south and causes the waters to gush from the flinty rock. It is probable, that a portion of the Hindoo veneration for the range is owing to its containing the springs of so many of the rivers which fertilize their country.

When at Sungla, the traveller should not fail to ascend the Harung Ghatee, over a brown sterile spur of the Ruldung, on the route to Me-

* I have seen a Sikh soldier go through exactly the same ceremony at a shrine near Makhawal Anundpoor. From how much superstition would a knowledge of the solar system have rescued the world!

bur and Cheenee, for the view of the snowy range and Passes to the south. The scenery on the Buspa at Rukchum is said to be of the finest description: want of time prevented our seeing them. At Sungla is first met the petit shrine called *Chastun* by the Buddhists; in one of the four sides a small cylinder revolves on an axis, which the passenger puts in motion. Such a cylinder on a great scale may be seen in the temple at Soongnum, inscribed all over with 'om mane pudme hom,' which Klaproth interprets 'oh! the Jewel is in the lotus:' of which the esoteric meaning is very deep. The prayer is considered as good as said by each revolution; an idea which could never have originated but in the mechanical and material mind of the Mongolian race.

This day, the 18th, was cloudy, and snow fell on the Passes to the southward, but the afternoon was fine. We halted on the 19th.

September 20th.—From Sungla to Nooroo Bassa, about ten miles, in six hours, generally up an easy ascent by a path which is perfection, compared with any between this and the Shatool: traversing first some woods of cedar and koil, and then over the cultivated slopes of one or two small hamlets, where the wheat and barley were being cut, and sent down to Sungla. Above this, the path lies over grassy mountains, with wooded crags across the torrent to the left-hand; the whole somewhat tame after what we have seen, but for the Ruldung. The Chough abounds amidst the cliffs in all this and the upper portion of Kunawur. On the way to-day, we met a herd of the Yak, which supplies the *Chownree*. In Thibet, or the neighbouring districts of Toorkistan, we have the origin of the Pashas of one, two, three, or many tails, who once carried terror over Europe. About 1,000 feet below Nooroo, the path turns to the right, the glen of the Nulgoon Pass being straight ahead. About here large beds of *Ligularia arnicoides* were in seed fully ripe, while on the south side of the range, it is still in full blossom: 700 feet higher, the declivities are covered with *Anagyris barbata*; the seed nearly ripe, but much injured by grubs. The roots are much branched, and extend several feet under ground. The plant is here called *Bhaloo ka buroot*; it flowers in May and June, and resembles a lupine of the deepest purple. Nooroo Bassa is an extensive open piece of grassy land, 12,985 feet above the sea, and a few hundred feet above the highest birches, which afford abundance of fuel. A stream flows about 100 feet below to the south amongst beds of

snow; its right bank is rugged and craggy; the left sloping and covered with *Cyananthus*, &c., the general prospect limited and rather uninteresting. A bitterly cold storm of sleet came down from the Pass, just as our tents arrived, and we had hard frost all night, fully a month before it is thought of at Simla.

September 21st.—Over the Roopin Pass to Rasur or Rasrung, called also Surra Peechoo, distance eleven or twelve miles. We left Nooroo at twenty minute past six A. M., and by an easy ascent reached the crest of the Pass at a quarter past nine, including, as elsewhere, several stoppages to collect seeds, &c. Heavy and suspicious masses of clouds accelerated our departure, but the sun soon dispelled them, and revealed the gigantic forms which surrounded us—the embodied frost—giants of the Edda, and very *unlike* the guardian angels seen by Gehazi to encompass the prophet. The northern declivity of the Pass is quite a trifle in comparison with that of the Shatool. On the 20th of September 1833, it was an unbroken and extensive sheet of snow, but to-day we only met two beds of it near the summit; nor is there any Moraine, so terrible at the Shatool from its chaos of sharp gneiss masses. Here the rock is chiefly flat micaceous slate, sometimes approaching to sandstone, and therefore of easy passage, though not macadamized. The grand cliffs of the Shatool are also wanting here, but on the left or east, there are some fine shivered pinnacles of rock, plentifully strewed with snow-beds and sufficiently high

‘To shew,
That earth may reach to heaven,
Yet leave vain man below.’

And nowhere does he appear vainer and more insignificant than here, if we regard only his physical strength and size; at the same time, the mind of a Shakspeare or a Newton is more truly wonderful and sublime than all the Ossas heaped on all the Pelions in the world. The glory of the Roopin Pass consists in the cascades on its south side, in its lovely valley, and in the views of the Buspa Dell and the Ruldung pinnacles, which from this point are seen from NE. to E. rising from great fields of the purest snow, untrodden by man, and probably by any living thing. On the 21st September 1833, the thermometer boiled on the summit of the Roopin at 186°: the elevation is reckoned to be 15,460 feet: and on that day about noon it stood in the shade at 49°,

and in the sun at 68° . It is the Pass marked Goonas in the map, which is another error, the Goonas being more to the west. "Pilgrim" refuses to all this range the honour of being the veritable Himalaya, and Captain Herbert considered, that the true continuation of this latter was in the Ruldung group, penetrated by the Sutluj near Murung : it is however merely a question of more or less ; and there is, at all events, no denying that from the Shatool Pass eastward, there is a snowy range, inasmuch as even on its south exposure, the snow never disappears ; nor can the fact of its gradually declining below the zone of perpetual snow in the Moral ka Kanda, between the Sutluj and the Pabur, detract from its claim ; though it must be allowed, that the mountains and Passes are inferior in altitude to those of Kemaon ; nor can the north-western mountains, any more than the whole world, furnish the prospect of overwhelming sublimity which the spectator enjoys from the Gagur, Binsur, and many more points near Almorah. Still the easternmost Pass into Kemaon from Thibet, the Byans, is under 16,000 feet elevation, and of so gentle ascent, that it is crossed on horseback : and the Chinese invasion of Nepal proves that, still more to the east, the Passes can scarcely be so difficult as the Shatool.

Like Dean Swift, the mountains die at top first, and except a small white *Helichrysum* and the fragrant *Centaurea*, the vegetation on and near the Pass is now being rapidly burnt up by the frost : two or three *Gentians*, the *Aconitum dissectum*, and the *Delphinium vestitum*, seem alone to defy its power : but few flowers remain of *Saxifraga parnassiæ-folia* (*orglandulosa* ?), *Sieversia elata*, *Ligularia arnicoides*, the yellow *Tanacetum*, common *Senecio*, and a *Polygonum* like the bistort of the Alps. On the crest of the Pass grow the *Aplotaxis gossypina*, *Potentilla inglesii*, *Hymenolæna govaniæna*, *Corydalis meifolia*, and *Saxifraga imbricata*; the last two in flower.

We quitted the crest at quarter past 10 A. M., the wind being bitterly cold, and descended 800 feet or so, over loose stones and frozen snow, by a steep rocky *kloof* to a kind of oval basin, extending in length from NNW. to SSE. from six to eight miles, by two or three across, enclosed by a barrier of black broken crags, debris, and snow beds ; the surface covered with snow and mica slabs, thrown about in great confusion ; a scene of utter silence and desolation. Here and there, there is a pool of water, and a multitude of tiny rills trickled under the stones, the

sources of the Roopin river, of which the glen below this valley, is found, after a long and steep descent, to be completely blocked across by a precipitous wall of black rock, from 250 to 300 feet high. Over this the accumulated streams leap down by two falls, which, to the best of my memory, surpass in beauty the finest in Switzerland: the water perfectly clear, and reduced to white mist like the Staubbach, falls in the softest wreaths over successive tiers of ledges, and about a mile lower down, where the two falls are brought into one line, the effect is exceedingly fine. The path has hitherto kept on the right bank of the stream, but crosses between the falls, where in 1833, a deep snow-bed supplied a bridge; but this year, it is much melted here, though at the base of the lower fall, the river passes under an enormous mass of it. Here the path improves, following the narrow glen alongside the river, now flowing gently for a few miles as if to rest after its great leap. The mountain-cataract, which, having leaped from its more dazzling height,

‘ Even in the foaming strength of its abyss,
 (Which casts up misty columns that become
 Clouds raining from the re-ascended skies,)
 Lies low but mighty still.’

The lateral cliffs all down to Rasrung are continuous on each side of the valley, and so whitened with cascades, that the scene considerably resembles Lauterbrunnen, in the Canton Bern, and fully deserves that name—“nothing but springs.” There is here indeed no wood, the whole being quite above the region of forest; but the grassy or rocky talus at the base of the crags, as well as the small levels by the water, are richly enamelled with flowers:—such as *Primula stuartii*, *purpurea*, and *glabra*: *Sieversia elata*, *Aconitum dissectum*, *Ligularia arnicoides* and another, *Polemonium cæruleum*, *Scrophularia urticæfolia*, the blue *Meconopsis*, and a host of *Compositæ* and *Labiataæ*, especially near the falls; the Greek valerian is very common, and in full bloom, as is a very pretty species of *Forget-me-not*; these, and the *Lotus corniculatus* are amongst the many examples which in these mountains frequently replace us for a moment or two in our native land:

‘ And, as in forts to which beleaguers win
 Unhoped-for entrance through some friend within,
 One clear idea wakened in the breast,
 By Memory’s magic, lets in all the rest.’

Many of our Himalayan tourists, especially the earlier ones, have allowed their imaginations to run away with their judgments, and have dressed up their descriptions more in the style of Macpherson or of Harris than of sober prose: but it must be admitted in extenuation, that the reality of the scenery, and the champagne atmosphere, able to drive all sadness but despair, have an inevitable tendency to exalt the spirit to the ethereal regions, which there, Chamæleon-like, naturally assumes the tint of their deep native *blue*. Even in the physical department of the man, a greatly diminished dose of alcohol will suffice to produce intoxication. The daily repetition, however, of the sublime and beautiful, is very apt to create a revulsion of feeling, till at length, to get rid of the perilous stuff which preys upon the heart, we take refuge in apathy, and perhaps fall so low as to adopt the Frenchman's panegyric, "Grande, magnifique, superbe—pretty well!" or at least to swear with Akenside—

' Mind, mind alone, bear witness heaven and earth,
The proper fountains in itself contains
Of beauteous and sublime.'

After many delays from seed and plant-collecting, and a heavy storm of rain and hail at the falls, we reached Rasrung at half-past 3 P. M.; a small sloping plot, covered with grass and flowers, just below the highest birches on the right bank of the Roopin, which is here crossed by a natural bridge of snow, still from twenty to twenty-five feet thick. The usual encampment is a little lower down and on the opposite (or left) side of the river, under a high cliff called Jeyral, where water boils at 194°, which gives an elevation of 10,800 feet. Rasrung is about 11,000. The sward here, and at Seetee, is much cut up by an animal like "a rat without a tail," which is figured in Royle's Illustrations, and is also found on the choor. It takes two hours to reach the upper water-fall from Jeyral, and four, the crest of the Pass. We had frost all night at Rasrung.

September 22nd.—To Jaka, ten miles, in six and a quarter hours. A cloudless morning, but we only reached our tents at 2 P. M. in time to escape a heavy rain, which fell in snow on the Passes. The climate up here is as "perfidious" as that of England: a sky without a speck at six A. M. is overcast by noon: at 2 or 3 P. M. we have a storm, and all is blue again: often however—and the phenomenon seems hitherto unex-

plained—no rain falls, but heavy clouds rest on all the mountains, which, notwithstanding the increase of cold, altogether disappear during the night. In Kemaon, when all else is perfectly serene, a fine thin wreath of cloud may be seen to issue from the summits of Nunda Devee (No. XIV. of the great map) and the Panch Choola (No. XIX.) which has led Europeans to the conclusion that a volcano exists there: while the natives solve the appearance by the supposition that culinary operations are going on amongst the immortals.

The route to-day was by a very rocky and often tree-encumbered path, but never difficult to a footman, following for some miles the right bank of the river, which is then crossed by a snow-bridge. It continues for a greater distance on the opposite bank, and finally returns to the right side by another snow bed, which must be permanent, being entered in the Trigonometrical Survey map, made about twenty-five years ago. For the first half or better, the glen, about 200 yards wide, is bounded on each side by noble-bastioned crags, in several places rising vertically from the river full 1,500 feet, and terminating in picturesque shattered pinnacles. The vegetation though luxuriant is still herbaceous, only consisting of *Aplotaxis aurita*, *Polygonum molle*, *Aconitum heterophyllum*, *Cynoglossum uncinatum*, *Sedum purpureum*, *Spiræa kamtschatica* (Meadow-sweet), *Polemonium cœruleum*, *Geranium wallichianum*, *Potentilla atrosanguinea*, *Corydalis govaniana*, *Scabiosa candolleana*, *Achillœa millefolia*, a straggling *Cerastium* with flowers like *Stellaria holosteum*, called Gundeeal, and used as a vegetable. But the birch soon clothes the cliffs, and then fine clumps of the dark silver fir (*Picea webbiana*) like so many gigantic cypresses, appear and become the predominant tree, with maple, and a rich underwood of lilac or "Shapree" (*Syringa Emodi*), the lemon-scented *Laurustinus*, "Tealain" or "Thelain" (*Viburnum nervosum* of Royle), *Rhododendron campanulatum*, *Lonicera obovata* and *bracteata*, *Rosa sericea*, *Ribes glaciale* and *acuminata*, several *Salices*, &c. Amongst the shady rocks here and on the eastern side of the Changsheel, &c. grows a large tall composite plant of the *Corymbiferae*, with a very strong smell of raw carrots; and on the cliffs of the right bank I found large tufts of a very elegant *Dianthus*, in full bloom, of a pink colour.

The levels on the river banks are delightfully wooded with birch, pine, maple, &c.: the scenery is so exquisitely beautiful, combined with

the grandeur of the rocks, that one is tempted to reverse the Persian proverb and ask what was the purpose of creating heaven while this valley existed? The Roopin, occasionally bridged and banked by snow-beds, and clear as crystal, dashes on from rock to rock, augmented every half mile by rivulets from the lateral cliffs and glens. These are generally constituted of mica-slate, but at the lowest snow-bed, the rock alters to quartzose strata, with a corresponding change in the scenery. Crossing to the right bank, the path ascends a steep of 800 to 1,000 feet, and the silver fir gives place to a dense and lofty forest of koil and pindrow pines, yew, hazel, *Rosa webbiana*, &c. The glen narrows to a gorge, the left bank presenting a wall of magnificent cliffs, perhaps 2,000 feet high, facing WSW., the brow splendidly wooded with pine. These cliffs soften down opposite Jaka into steep declivities, covered with forest and spacious grassy glades. The river raves below, and is no more approached in this stage. On leaving the forest, we reached Jaka by about a mile of more open country, interspersed with thickets of *Rosa sericea*, *Berberis brachybotrys*, &c. The pasture is covered with *Iris kemaonensis*, *Inula royleana*, the scarlet and orange varieties of *Potentilla atrosanguinea*, &c. Jaka is but a small village, overhanging some huge crags, and surrounded by great horse-chesnuts, walnuts, peaches, &c. under which we pitched, but found their shade much too chilly. Water boiled at 198, which gives under 8,000 feet: but the place is probably higher. We found the people very civil; a frank, rough, good-humoured set, the Mookheea especially, being a pattern of these excellent adjectives, and like Democritus, meeting every difficulty with a laugh or a loud whistle, the Lillibullero of the Himalaya. The people are of small stature and dark complexion, negroes almost compared with the fair faces of the vallies below Simla, which proves, if proof be wanted, that the colour is not entirely dependent on climate.

September 23rd.—To Kooar, nine miles, in four and a quarter hours, an easy stage in this direction. For about a mile and a half the path is execrably bad, rocky, and steep, descending about 1,500 feet to the river, and reaching its bed by a short but rather difficult ledge of rock, known as the Tunkoor Ghat, which reminded us in a small way of the Panwee ka Dhunka. The Roopin seems here to have several names, Sheelwanee, Gosung, Tous, &c. We soon quitted its bed, and re-ascend-

ed some 800 or 1,000 feet, through forests of pindrow, large hazel trees (*Corylus lacera*), *Grewia* (or *Celtis*), *Rhus buckiamela*, *Millingtonia dillenifolia*, *Staphylea emodi* (*nagdoun*, the snake-subduer), *Symplocos paniculata*, *Betula cylindrostachya*, elm, and maple; the vegetation of Nagkunda. The opposite bank is one series of huge crags and cliffs, falling sheer down to the river, with a "boundless contiguity" of pine above. A large tributary here joins the Roopin from the wild shattered glen of the Nulgoon Pass. Open, grassy, and rather warm mountains succeeded, on which the path gradually declines to the river, where we reached the left bank by the sanga—called in the map, Wodar—from an impending rock, used as a sheep-fold. From this an easy ascent of two miles, shaded by elm, Horn-beam (*Carpinus viminea*), horse-chesnut, *Cornus macrophylla*, rhus, Alder birch, maple, and Mohroo oak—brought us to Poojalee, a very well-built village, one of the group of four or five collectively, called Kooar, situated on the sunny slope of the mountains, amidst a profusion of the usual fruit trees, and with a spacious tract of terraced cultivation, now one rich glow of the splendid carmine, orange, and yellow hues of the Bathoo, and the more delicate pink of the Phuphur or Buck-wheat. A fine stream rattles past the village from the mountains above, which extend from NE. to SE. covered with forest, and reaching the region of birch. They slope up easily, but from N. to NE. several bold peaks and bluff rocky promontories stand out in all the "wild pomp of mountain majesty."

Though now uncommonly low, the Roopin is here quite unfordable; its general temperature from Rasrung down to Kooar, is in the day-time from 46° to 50° at this season; from the clearness of its water and the beauty of its banks is most likely derived its name, which I think signifies "beautiful," as "Pabur" means "clear"—Tous (or Tamasa) "dark blue," &c. All the advantages indeed, of this valley, Paradise are counterbalanced by some serious drawbacks, one of which, the goitre, deforms rather than afflicts almost every inhabitant of Kooar; for while it shortens the breath, it does not, they say, shorten life or cause pain. In so far as it disables its subject from climbing the mountains, nature may seem to fail in adapting man's organization to his circumstances: but I could not learn that with his breath she takes away his mind too, as in those shocking samples of humanity, the cretins of the Valais, &c.

Water boils here at 198, which would give about 8,000 feet elevation. The villagers are of dark complexion. They keep numerous bee-hives, as usual located in the walls of the houses, which are very substantial, of stone and timber, roofed with thick slabs of mica-slate,

September 24th.—To Kala Panee, ten miles or perhaps more, in five hours and fifty minutes, of which the minutes were spent at Doodoo. The path falls in about 600 feet to the Roopin, passes it by a sanga, and continues for about a mile on the right bank through grass; then crosses a torrent from the Changsheel Pass, and finally quits the Roopin river and glen by an ascent of 1,200 feet up the steep grassy mountain to Doodoo or Doodrah, a considerable village, reckoned 8,732 feet above the sea, and the chief place of the district called Ruwain in NW. Gurhwal; the locality of which, Prinsep in his account of the Ghoorka war declared himself unable to assign. The *Iris nepalensis* is plentiful here on the damp shady ground, as *Iris decora* is on the sunny meadows below. The Mohroo oak (*Quercus dilatata*) grows at Doodoo in great beauty and perfection: one specimen by the wayside measured nineteen feet round at five from the ground, and possesses so superb and verdant a head, that it would have been deified in the time of the Druids. It does not appear that any superstition attaches in these mountains to the oak similar to those which made the Greeks people it with dryads and oracular demons, and the Celts to regard it as the habitation of Darnaway, their Jupiter Tonans, as apostrophized in masonic strains by one Vettius Valens Antiochenus;

‘ By the bright circle of the golden sun,
By the bright courses of the errant moon,
By the dread potency of every star,
In the mysterious Zodiac’s burning girth—
By each and all of these supernal signs,
We do adjure thee, with this trusty blade,
To guard yon central oak, whose holy stem
Involves the spirit of high Taranis :—
Be this thy charge.’

Our mountaineers are too much accustomed to lop oak branches and leaves for their cattle to believe there can be any thing very sacred about it.

At Doodoo, the path turns to the right, and after rising for a mile or more through an open cultivated country, enters the forest, in which it

continues generally ascending, for three miles more to Kala Panee, which is a very damp confined spot, so closely hemmed in by the trees as scarcely to afford space for a tent. This forest, covering the north side of a spur from the Changsheel, is very dense and chilly, consisting for the most part of tall pindrow firs, yew, maple, hazel, cherry (*Cerasus cornuta*), white-beam (*Pyrus lanata*), with a very rank undergrowth of *Nepeta goviana* (a very aromatic plant), *Adenostemma*, and a tall shrubby species of *Strobilanthes*, which also abounds on Huttoo and Muhasoo, and which the hillmen fancifully assert to flower only on the year of the Muha-koomb at Hurdwar. The truth is, that the plant is greedily eaten by sheep, and that perhaps not one in a myriad escapes being browsed too low to admit its flowering, which this season occurred from August till October.

Water boils here at 197°, and the elevation is probably about 9,000 feet. There is no village nearer than Doodoo, from which supplies must be brought on. Heavy storms of rain, hail, and thunder all the afternoon from 2 p. m. made this uncomfortable spot doubly wretched.

September 25th.—Over the Changsheel Pass to Looloot or Lourrot, about eleven or twelve miles, which took us eight hours, including many stops and a long rest on the Pass: the march may be easily performed in six hours. The route continues up the forest, which abounds in streams; path rather rocky, and blocked up by fallen trees. The black bear is common and dangerous: we saw a man at Doodoo who had been terribly torn by one without any provocation; the white or yellow species is also said to abound, but frequents the crags on the heights above the forest. Emerging at length from its chilling shade, we reached an alpine glade, like all the higher parts of the Changsheel, a perfect carpet of flowers of all forms and colours; the Botanic Garden of Asia. Amongst them were conspicuous the *Anagyris barbata*, *Morina longifolia*, and *Codonopsis rotundifolia*; and now the *Picea webbiana*, *Rosa webbiana*, lilac, currant, &c., appear, followed, as we rose, by *Dolomiaea macrocephala*, *Cassiope fastigiata*, *Ligularia arnicoides*, sweet *Centaurea*, *Polygonum vacciniifolium*, tansy, and other plants of the snowy range. On the western side, the *Caltha goviana* (or *Himalensis*), the marsh marigold of England, the azure *Meconopsis*, and a large *Cynoglossum* (*grandiflorum*) resembling the common English hounds-tongue, are abundant, as the *Cyananthus lobata* is on both sides. The crest

of the Pass, 12,871 feet above the sea line, is attained after a considerable ascent in the region above the forest, with lofty grey crags and spires of gneiss and mica slate above on the right hand; and is considered high enough to be worthy of the stone cairns which mark the fear and the gratitude of the mountaineer. Being fortunate in a cloudless day, we rested a considerable time on the summit to inoculate our minds with the most extensive and magnificent panorama around us. The snowy range, that embodied eternity, "shining like truth" or rather considerably more brilliant, is seen to perfection, and not looking the worse for a good sprinkling of snow yesterday; the Changsheel itself is perceived in this direction emanating from the parent mass in a ridge of shattered crags and pinnacles, on which summer may be fancied to have been just impaled by the frost-giants; and the range from the Boorun to the Shatool Pass, with its lofty, shelving, and now russetting continuation towards Rampoor and Huttoo. It is interesting to observe how regularly the forest all round ceases at a regular level, or at best creeps beyond the line of demarcation a little in the ravines, to be succeeded by the zone of grass and flowers. Kooar is seen below to the east, and on the west the view reaches down the vale of the Pabur to Chergaon and Rooroo. To the SW. is a great reach of the Changsheel, the rounded and almost tabular summits rising considerably above the luxuriant forest which clothes their lower declivities, and presenting a gently sloping surface of the finest yellow autumnal tints; a most inviting though rather remote site for a settlement. The supply of wood for fuel and timber is inexhaustible; and the rice of Chooara would supply abundance of one important element of food:—at all events, it would furnish a most eligible spot for the head-quarters of a summer party from Simla. The circle of vision is completed on the south by a dreamy, mystic, "multitudinous sea," with the snowy range for the bounding surf, the swelling outlines melting into each other, and the whole seeming as if it reposed to all eternity after the enormous efforts by which it was upheaved. The Himalaya is seen to the best advantage, not at noon, but a little before sun-set, when, especially in the cold season, its whole extent is at once, and most gloriously lit up to a rose or copper colour, "one living sheet of burnished gold." Gradually the "sober livery of grey twilight" creeps up towards the loftiest peaks, extinguishes all their "bright lights" and replaces them with the deadly

pale hue of a corpse; the soul of the mountains has departed; and if the spectator be contemplating the ranges north of Simla, he says or sings its requiem with the pun—" *Sic transit gloria Mundi!*

The descent from the Changsheel Pass to Looloot is by the south side of a great spur of the mountain, and is so gradual and winding that the forest is not reached for above two miles; the first trees met are the birch, the horned cherry, the mountain ash, the Kurshoo oak, the silver fir, and most abundant coppice of *Rhododendron campanulatum* and *Rosa webbiana*. The oak and fir soon predominate; lower down the forest is almost exclusively pindrow, with koil, rai, cedar and the sweet *Viburnum*: and lastly, the usual thickets of *Rosa sericea*, *Berberis*, and *Indigofera*, lead to the arable tracts. Except in the pindrow forest, where it is steep and slippery, the path is generally very good this stage. Water boils here at 198°, indicating an elevation of from 8,000 to 8,500 feet: but the thermometer had not been verified, nor the water distilled, both very necessary to the accuracy of the process. Looloot is an insignificant place, and the inhabitants seem a poor, filthy and rather ill-looking race. They have had however, the spirit to introduce the cultivation of the potato, of which we obtained a small but welcome supply. This is the only site beyond Muhasoo where we observed any. A stream flows towards the Pabur below Looloot; the opposite side of the glen, to the SW., is thickly peopled, and beautifully cultivated, the Bathoo as usual in the greatest proportion. With all its brilliancy, the bread made from its flour seems bitter and unwholesome.

September 26th.—To Chergaon, eight or nine miles, in three hours: the first part of the route is a descent of from 1,500 to 2,000 feet down grassy mountains to the Pabur, which we crossed by a sanga of two spars opposite Tikree. The path then keeps the right bank to Chergaon, and is good, except in one place where it passes for a few hundred yards on a narrow rocky ledge, about 200 feet above the river. Here, in 1833, a friend of mine lost his ghoot by the fall of a small bridge, and in general, it is not advisable to take ponies beyond Chergaon. In May and June, when the glen of the Pabur is excessively warm, the traveller to the Shatool and Boorun Passes may avoid it by keeping the heights above the right bank by a route from Huttoo, given by Captain Hutton, in one of the volumes of the *Journal of the Asiatic Society of Bengal*. Even at this season we found the temperature

disagreeably warm, till the sunny forenoon was succeeded by a cool cloudy day. On the 27th we walked to Rooroo Kothee in two and a half hours.

September 28th.—To Thana Kushain, ten and a half miles, in four hours and forty minutes: the road is good, chiefly through cultivation; quits the valley of the Pabur about three miles below Rooroo, and in two more, by an ascent of 1,000 feet, reaches Krassa, an exceedingly well-built and comfortable looking village; the Kunaits, or descendants of the Rajpoots and aborigines occupying one department, and the Kholees, or Helots, a separate one. These poor outcasts are held in great contempt, and are never allowed to mix in society with their liege lords, the Kunaits. In a pine-wood here, the downward traveller should breakfast and pass the heat of the day. Hence the road undulates up the left bank of the alder-fringed Pursrar or Dogra Nuddee, formed by two branches which unite below Kuskain. We ascended the fork for 600 or 800 feet, and encamped a little above the village in a very airy spot, shaded by some fine cedars, with the twin-village Thana a little below to the west. The elevation is probably 7,000 or 7,200 feet, which ensures a delicious climate after Rooroo. About 500 feet higher, and a mile distant on the ridge above to NW., is the small but rather inaccessible fort of Tikhur, formed by two square-roofed bastions, connected by curtains, all of good masonry, and held by a garrison of one man, who refused to surrender till my companion climbed over the wall and opened the gate. The walls command an interesting view of spacious and well-cultured mountain slopes, with several large villages, above which the koil pine abounds, crowned by the lofty Chumba ridge and Suraroo Pass. This is the Nawur District, rich in iron ore, which is found disseminated in grains like iron-filings in a grey, friable micaceous sandstone, which is quarried from mines a little below the village, pulverized, and then washed in running water, which carries off the earthy matter; the ore is then smelted, and as much as a thousand maunds are said to be made in favourable years: most of which is carried on mules to Simla and the plains. The shafts or mines dip at all angles, and are very like the dens of wild beasts; they are more or less inundated during the rains, and the work can consequently only be carried on during the cold and dry seasons. Some of the ore is sent to Shyl to be smelted, probably to economize wood. The usual

rock here is a silvery grey mica slate, containing a very large proportion of quartz. There is also a blue clayslate, with which the houses are roofed in the concave style.

September 29th.—To Shyl or Hurrela, ten miles, in six hours; we had considerable difficulty in getting coolies; Kushain brought up its quota punctually, but on applying to Thana, we found that the Mookheea, having forgotten or disregarded, if he had ever heard, the precept of the Temperance Societies—

“There’s not a joy this world can give like that it takes away,
When the glow of slight excitement yields to drunkenness the sway,”

lay gloriously or hopelessly drunk—‘o’er all the ills of life victorious;’—so that we were compelled to assume his official functions, and use a little gentle coercion. The route lies up the mountain a little to the left of Tikhur, and on reaching the crest of the Chumbee range, continues along it to the right, gradually ascending. The mountain, hitherto smooth and grassy, with a mica slate basis here changes to gneiss, which occurs in a labyrinth of great blocks and crags, with a coppice of Kurshoo oak, *Viburnum nervosum*, cotoneaster, &c. The more common plants are *Nepeta govaniana*, *Impatiens (glandulosa?)*, *Potentilla atrosanguinea*, *Polygonum molle*, *Delphinium vestitum*, several *umbelliferae*, and the *Anemone discolor*, “Kukra,” which in May covers the mountains with its white and blue. The acrid leaves are used by the mountaineers to raise blisters; but they are said to produce bad sores, leaving a permanent scar. The “Chitra” or *Drosera muscipula*—“Sundew”—a curious little plant which abounds between Kotgurh and Simla is applied in the same way. The elevation of the Suraroo Pass is 9,875 feet, commanding a glorious and extensive view, which includes the Koopur and Kunchooa ranges, the Moral and Changsheel up to the snows, with a long segment of the great range itself, in which the positions of the Shatool and Boorun Passes are well fixed by their pyramids. On the other side the huge wooded and grassy range of Huttoo is the most prominent object, its base watered by the Chugountee Nuddee, the opposite or western bank of which presents one of the most beautiful and extensive sheets of cultivation in these mountains. Chumba, Chumbee, or Chamee is a term very generally used in the Himalaya to express a mountain range. The road to the summit of this Chumbee is good, and we reached it in three hours very quiet walking; but the descent to Shyl is the

very reverse, the path being very steep, bad, and rocky, over a most dazzling decomposing micaceous shale near the top, and with some awkward steps near the bottom, where several streams are passed—the head waters of the Chugountee, one of the main feeders of the Girree. Shyl is a considerable village, or rather group of villages between two of these, and possesses a good share of arable land. It belongs to Busehur, and is about 8,000 feet above the sea. Passing the villages we descended by a rough flight of stone steps to a stream, and then re-ascended the opposite or Huttoo side, till about 100 feet above Shyl, where we pitched our tents by a Bowlee amidst woods of young cedar. Supplies are got with difficulty from Rutnaree, a village about one mile south, which shares alternately with Shyl, the charge of hospitality, and which would apparently transfer to it willingly the whole honor and merit of entertaining strangers, perhaps from having hitherto been so unlucky as to chance on few or no angels amongst them.

September 30th.—To Nagkunda, eight or nine miles, over Huttoo mountain, of which we reached the summit, 10,670 feet, (water boiling at 190°) in 1 h. 50 m. by the Pugdundee route, which keeps to the left of and below the made road, and, which from precipitous rocks, is impracticable for ponies. The made road passes under a ruined fort called Kurena, and then over the north shoulder of Huttoo, within 400 feet of the summit, on which we passed some hours. Huttoo or Whartoo, may be called the Righi of the Himalaya; but it must be confessed, that we are here totally deficient in three main constituents to the attractions of the Alps: first, their exquisite lakes; second, their equally exquisite hotels and markets; and third, their historical or legendary associations, such as those of William Tell, and the confederates of Grütli. In Hindooism the gods interpose so constantly, that man is nothing. But so far as natural scenery is concerned, I do not know a more delightful walk than that along the rounded swelling knolls of the Huttoo range, with its edging of “castled crags” of gneiss rock to the north-west, its alternate coppices of Kurshoo oak, and meadows enamelled with flowers, and its spacious views. Those of the snowy range are inferior to few, extending from (probably) the Peer Punjal of Kashmeer by the Chumba, Koolloo, and Shatool ranges, to and beyond Jumnotree, which rises over the high slopes of the Changsheel like a double-poled tent. Choor, Koopur, Kunchooa, Moral, are all conspicuous features; Huttoo itself being protract-

ed towards the last in the darkly wooded summit of Kot, below which to the right is Nowagurh, once a garrison of the Ghoorkas, who had also several posts, now dilapidated, on Huttoo, and who indeed, Kenite-like, made their nests on the rocks of every commanding height in these provinces. Half way between the Choor and Kunchooa range in Tiroch (the Ootroj of the map,) appears an isolated summit, probably Deobun, on the Mussooree road, between the Tons and the Jumna. On the W. and SW. are the Shallee and Muhasoo mountains, and on a clear day the houses of Simla may be discovered on the distant and hummock-like Jaka, which, after the grander features of the interior, looks small indeed. All around is the same ocean of summits and ranges which render the Himalaya rather one vast mountain of 1,500 or 2,000 miles in length, than a series of mountains; for no where do we find the comparatively broad vallies of other systems, and this character may be best expressed by a different reading of one of Campbell's lines, "its peaks are a thousand, their bases are one." In the absence of lakes it is apparently parallel to the Andes. Including the charming walk from the summit of Huttoo down to Kotgurh, and the ascent thence to Nagkunda, the botanist will enjoy a rich treat on Huttoo and its great buttresses. The summit pastures are alive with *Fritillaria verticillata*, *Morina longifolia*, *Aster alpina*, *Anemone discolor*, *Corydalis govaniana*, *Potentilla atrosanguinea*, *Viola reniformis*, *Hemiphragma heterophylla*, *Veronica*, &c. &c.; and the crags with *Lloydia Himalensis*, *Saxifraga ligulata* and *parnasiaefolia*, the shrubby *Potentilla rigida* or *arbuscula*, *Anemone villosa* (which is very common on the rocky banks of rivulets above the forest belt of the great range), two species of *Lonicera*, one of which greatly resembles *L. alpigena*, *Ribes acuminata*, *Pyrus foliolosa* and *lanata*, and a few very stunted specimens of *Rhododendron lepidotum*. The *Roscoea alpina* is found up to 9,500 feet. The declivities of the mountain are clothed by a magnificent forest of *Abies smithiana*, *Picea pin-drow*, *Quercus semicarpifolia*, maple, yew, and towards Nagkunda, sweet scented *Viburnum* (Thelain), *Kadsura grandiflora*, *Deutzia corymbosa*, *Philadelphus tomentosa*, *Symplocos paniculata* (Lodh, Loj—a sheet of white bloom in May), the scanitent *Hydrangea*, (*H. altissima*), *Rhus buckiamela*, *Jasminum revolutum*, and many species of *Desmodium*, *Indigofera*, *Berberis*, *Clematis*, &c. form a dense brushwood or coppice; while the mossy rocks and shady banks are covered with *Wulfenia am-*

herstiana, *Primula denticulata*, *Pedicularis megalantha*, *Gypsophila cerasioides*, "Bhatlee," several beautiful species of *Impatiens*; and in the deepest recesses of the woods *Actæa acuminata*, *Aconitum palmatum*, *Angelica glauca*, *Adenostemma*, *Strobilanthes*, *Lilium giganteum*, called "Book," and *Arum speciosum*, "Gangsh or Jungoosh," a curious plant, the spathe of which beautifully striated with green, and ending in a long thread, bears an alarming resemblance to the hood of the cobra di capello. In autumn the bushes towards Kotgurh are matted with the leafless and sweet-scented Dodder (*Cuscuta grandiflora*), which, having no root, the natives may safely promise boundless wealth to the lucky man who finds it. The Akash-bel, or heavenly twiner of the plains, *Cuscuta reflexa*, may be considered the Mistletoe of the Brahmans.

Huttoo only requires a deep lake and a slide of Alpnach to be a mine of wealth in its timber; at present it lives, dies, and rots uselessly. In several places large tracts of pine have been killed, perhaps by lightning, and remind us of Milton:—

"As when heaven's fire
Hath scathed the forest oaks or mountain pines,
With singed top, their stately growth, though bare,
Stands on the blasted heath."

The Berbery at Nagkunda, &c. is a distinct species, which is now covered with the most profuse crop of fruit, of a fine blue, with a bloom of a pink or lilac colour. It makes excellent jam, and I have had the pleasure of seeing young plants raised in Dublin from seeds which had undergone that fiery ordeal unscathed.

The descent to Nagkunda occupied us one hour and twenty-five minutes; there is a good bungalow, and two or three buneecas. As is frequently the case in this direction, the waters flow on one side to the Bay of Bengal, and on the other to the Arabian sea. The elevation of the bungalow is 9,000 feet. In one of the shady glens to the north, and about 1,000 feet below, there is a most copious chalybeate spring, known as the Lal-panee.

The *Polygonum molle* or *polystachyum* is very luxuriant about Nagkunda.

October 1st.—From Nagkunda to Muteeana, by the Pugdundee route, over the back of the Kumuloree or Sheerkot mountain, about ten miles, which we walked in three and three-quarter hours. The path rises

through brushwood immediately behind the bungalow for about 4,000 feet, or 10,000 above the sea, and in about two miles enters the forest of pindrow, yew, maple, white-beam, *Cerasus cornuta*, *Cotoneaster affinis* (Rous) and *acuminata*, with occasional glades covered with the richest beds of flowers, *Potentilla atrosanguinea*, *Anemone discolor*, *Geranium wallichianum*, *Aplotaxis aurita*, *Spiræa kamtchatkica*, *Campanula latifolia*, *Ranunculus*, &c. In the forest we find *Erysimum alliaria*, *Strobilanthes wallichii*, *Nepeta govaniana*, *Aconitum palmatum*, *Callimeris flexuosa*, and a species of *Diplopappus* resembling it, *Senecio canescens*, and a very elegant species, perhaps *asplenifolius*, also common on the north side of Huttoo : on the rocks, *Mulgedium macrorhiza*, *Saxifraga ligulata*, *mucronulata*, and another : and under the shadiest crags, the may-apple of N. America, *Podophyllum emodi*, and the enchanter's night-shade, *Circaea intermedia*, whose only connection with the black art seems to be the fact of its loving the absence of the sun. The views of the Chumba and Koolloo snowy ranges are magnificent, seen over and through the primeval forest, with the great range of Mundee to the right or north, the base covered with villages and cultivation, and the crest reaching up to about 11,000 feet, reported to afford cedar of the first dimensions. Huttoo lies on the left hand, and, latterly, Shallee, Muhasoo, and Simla, in front. At an abrupt turn, a path strikes down to the right towards the Sutluj and Koolloo, which must be carefully avoided, as well as another a little further on to the left, which will equally, though not so fatally, mislead the wayfarer, and beguile him of his summum-bonum, which, under present circumstances, is probably his breakfast. A convenient and most romantic spot for this is on some crags about half way, where there is a small spring just below the path to the north. So far the difficulties of this route have consisted mainly in the fallen trees ; but beyond this, both in and out of the forest, it becomes so rocky in several places, as to be totally inaccessible to ponies, and very difficult to jumpans. On leaving the forest, there is a rapid descent of about 600 feet to some crags, under which a multitude of sheep are tended, and on which will be found a very pretty white *Sedum* or *Sempervivum*, and the shrubby *Polygonum graminifolium* : after this four miles of pleasant walking along and down the southern and grassy face of the mountains, latterly through cultivation, lead to Muteeana bungalow, 7,900 feet, which

having neither doors nor window-frames, offers but a cold welcome, with a roof, too, resembling the sieve of the Danaides: they manage these things better in the plains and in Kemaon; but a decree has I believe gone forth for the erection of a new bungalow in a more convenient site than the present, which is more suited to the herald Mercury than to the mortal, weary, and thirsty traveller. It was the full intention of the late Major Broadfoot, C. B., to open the Pugdundee route, so greatly superior in scenery and shade to the made road, which, besides being nearly two miles longer, dips deeply into the hot glen below Muteeana, and is uninteresting till within a few miles of Nagkunda. It will always, nevertheless, be necessary as the winter medium of communication with Kotgurh, when the northern exposure of the mountain is buried in snow. In this warm glen, and in that of the Girree, grows the shirsha, a species of Acacia, perhaps *A. smithiana*, with flowers in May of the size of *A. speciosa* or Lebekh, the Siris of the plains, except that its long tassels of stamens are rose-coloured, and that it has not the delightful lemon fragrance of the latter. The shirsha greatly resembles *A. julibrissiu* (i. e. gul-i-reshm or silk-flower), a Persian species, which is naturalized about Como. In the same glen will be found the pretty little *Parochetus oxalidifolia* or *communis*, the *Cedrela serrata*, *Populus ciliata*; and in the cornfields on the way side, the Nepal wall-flower (*Erysimum robustum*), *Silene inflata*, *Carduus nutans* (the fine purple thistle), &c.

October 2nd.—To Fagoo, fifteen miles in five hours: the road rises to the Punta Ghatee, 8,500 feet, 100 feet above which to the right, stands a ruined post of the Ghoorkalees, who near this inflicted a decisive defeat on the mountaineers. Hence it descends and makes a great circuit to, and up the Kunag Ghatee, 8,400 feet, with the Teeba, 300 feet higher to the right; it then passes a little under Theog, and reaches Fagoo by a long but gentle ascent. Except some koil and oak woods below Theog, and the forest of Mohroo oak on the Kunag mountain, there is but little wood in this stage; the Mohroo oak (*Quercus dilatata*) considerably resembles the beautiful evergreen oak of Nynee Tal, and the Binsur and Gagur ranges in Kemaon, where it is known as the Tilonj, Kilonj, or Timsha: it is the *Quercus kamroopii* of Don's prodromus: this botanist was afterwards inclined to identify the two trees, but they differ considerably in several particulars. A few specimens

of *Quercus kamroopii* may be seen on a south aspect at Simla on the lower bazar road, near Lord Combermere's bridge: and far down in the vallies grows the "Banee," (the Funiyat of Kemaon), or *Quercus annulata*, which Don calls *Quercus phullata*. The handsome globe-thistle, the *Echinops cornigera*, is very abundant on the sunny rocks of the Punta and Kunag ghats, and *Morina longifolia* flourishes on the Kunag Teeba: neither of these plants occurs nearer Simla, though Muhasoo would at first sight promise them: but the neighbourhood of the plains seems inimical to many Himalayan plants: just as thyme is plentiful at Almorah, but unknown at Nynee Tal and the Gagur, with a much more favourable elevation. The *Iris decora* is common on the grassy slopes of the Kunag mountain, and towards Fagoo, the *Spiræa cuneifolia*, "Takoo," in May and June, whitens as the roadside-like hawthorn. The red *Potentilla* (*P. nepalensis*) and the deep-blue *Cynoglossum furcatura* abound at Theog, and tufts of the delicate little *Androsace sarmentosa* hung, as at Simla, from the sunny rocks.

This stage is generally decried as the most uninteresting near Simla, and it is assuredly rather bare: yet the views are fine; the bold bare precipitous peak and ridge of Shallee, like a lion couchant, are no where seen to such advantage, and are novel features in the more usual scenery of Simla. On the left hand are the snowy range, Jum-mootree, and the Choor; and latterly in the same direction the great northern spur of this last "cloud compeller" with its seamed and scarped flanks, pleasant meadows, and beautiful woods, reminds the traveller towards Mussooree, of one of the most picturesque excursions short of the snows; and the botanist, of *Trillium govanianum*, *Actæa acuminata*, *Paris polyphyllum*, *Podophyllum emodi*, and several *Polygonatums* and *Smilacinas*, which Fraser, by a pardonable deviation from botanical orthodoxy, calls the lily of the valley. The mountaineers commonly distinguish the Choor as the "Choor-chandnee" or "crest of silver," the original having no reference to any abstraction of silver spoons, as some, impelled thereto by Indian experience, have supposed. The summit exhibits the only granite hitherto discovered amongst the outer ranges of the NW. mountains, and is apparently a continuation of the line of granitic out-breaks traced by Mr. Batten in Kemaon, inside of the Gagur, which, in all likelihood, owes its superior altitude to the vicinity of this great natural lever. The granite of the Choor is,

however, somewhat different from that of Kemaon and the snowy range; and it is a remarkable fact, that this last (I speak from specimens of the vast precipices of Sookhee, near Gungootree) is identical in its abundance of felspar and black schorl crystals, with the granite of the Ajmeer hills; where, by the way, is an example never yet, I think, published, fully as conclusive on the igneous origin of this rock as the more celebrated Glentilt in Perthshire. The exact locality is three or four miles west of Nusseerabad, on the way to Rajgurh, where the granite is seen penetrating the stratified rocks in a complete and very extensive network of veins, and in several places imbedding large masses of them, in a manner that must satisfy the most sceptical, it was once in a state of fusion. The Choor also, which like another Briareus, with a hundred arms, domineers over the outer Himalaya, is the nearest point to Simla, where we meet with the silver fir; and separated as it is by comparatively low ridges from the great ranges which form the natural habitat of the tree, the fact necessarily gives rise to speculations on its origin, and as in the similar case of the Alpaca and Llama of the isolated Cordilleras of the Andes, and its own Lagomys or tailless rat, induces the question whether nature does not necessarily and independently give birth "automate" to like forms of organization under similar circumstances. Every traveller in the colder tracts of the Himalaya must remark the resemblance of the genera to those of Europe: while, with very few exceptions, the species are different; so much so, that as Mr. Batten observes, though our oaks have acorns all right, the absence of the sinuous leaf of the English tree is enough almost to excommunicate our spinous brethren. The only exception to the above rule appears to be in New Holland, as compared with a like soil and climate in South Africa, where her productions, animal and vegetable, are so dissimilar in plan from those of all the world besides.

The homeward route from Muteeana to Simla may be agreeably varied by a diversion to the Shallee mountain. From Muteeana to Bhogra, 1,500 to 2,000 feet below its summit, is a walk of six or seven hours by a path scarcely practicable for ponies. Back to Fagoo, via Kiarree, is about the same distance, including a long and tiresome ascent from the Nawul Khud: or one may return to Simla direct by Deotee in the Kotar state. Bhogra is the most southern of the cluster of five villages visible from Fagoo, on the east face of Shallee, the property of

the Thakoor of Kiaree Mudhan. Though very steep and rocky, there is no difficulty in the ascent to the summit, (9,623 feet above sea level,) where Bheema Kalee or Devee 'towers in her pride of place', in a small octagonal temple, and as nature personified, enjoys, when she pleases to look out, an exceedingly extensive and impressive view of her own works and votaries. Her character and attributes seem as severe as those of the Taurian Diana; and the mountaineers, who scarcely acknowledge any other god or goddess, hold her in such awe, that I have known one of them positively refuse to approach nearer than 300 or 400 yards to her fane, though it was our only shelter from a cutting blast. Hence, no doubt, she is said in Hindoo mythology to be the daughter of Himalaya. The entire northern face of Shallee is covered with dense forest, amongst which the *Cupresseus torulosa* is found in considerable quantity, being the only site in these Provinces where it appears to be truly indigenous. The day-lily, *Hemerocallis disticha*, is common by the water-courses, as is the *Abelia triflora* on the warmer exposures. On the summit grow *Ephedra saxatilis*—"syr"—and a silvery *Artemisia*, very like the *A. rupestris* of the Rhine.

"All things are full of error" said one of the ancients; and it is at best but a quixotic procedure to wander out of one's way to refute it, at the imminent risk of encountering controversial wind-mills, Biscayans, or Crowderos; and truth when found, may, like Mademoiselle Cunégonde, prove less attractive than had been anticipated. All that can be done discreetly is to knock an error on the head when met privately; and it may be accomplished with the less scruple on this occasion, as the present is, so far as I know, the only one into which the late Captain Herbert has fallen. I allude to his Geological Map of our Himalayan Provinces, where Shallee is included in the micaceous slate district; whereas it is in fact, one great mass of very compact, splintery, light-blue limestone, apparently very pure, with the exception of a small proportion of magnesia. Several plants will be found, which are, I think, peculiar to limestone, as *Cytisus flaccidus*. The mountain is very deficient in springs, and in the warm season is dependent for water on the pits called "Jors," which is of so vile a quality, that all Hudor-men-ariston men should carry up a supply from the Nawul stream.

October 3rd.—To Simla. The distant view of the hospitable homes of our countrymen identifies our feelings with those of the Mesopo-

tamian soothsayer, and we adopt afar off his exclamation—‘How goodly are thy tents, O Jacob, &c.’ but the nearer and beatific vision of the bazaar and its brimful stores, exalts our enthusiasm to the pitch of the wizard of the north, and we end our pilgrimage by a gastronomic application of his famous lines.—‘Breathes there the man, &c.’ Those heaps of flour and Shajehanpoor sugar are worth more than the purest cones of snow in the frosty Caucasus; those gram-fed fleeces than its shaggiest woods; those cases of aqua-vitæ, more soul-satisfying than its loudest water-falls. Rapt into future dinners, the Deotahs of the unfriendly rocks and snows of Emaus descend to insipid nonentities in comparison of Messrs. Barrett and Company, who are confessed the true dispensers of the good things of this life to all who can pay for them and to some who cannot.

Rough Notes on the Zoology of Candahar and the neighbouring Districts.

By Captain THOMAS HUTTON, of the Invalids, Mussoori; with Notes by ED. BLYTH, Curator of the Asiatic Society's Museum.

(Continued from Vol. XIV, p. 354.)

No. 20. The Wild Hog. These are plentiful among the high rushes at the lower extremity of the Bolan Pass, where they conceal themselves during the day, but issuing forth at night, they proceed to ravage the cultivation around Dadur. They are also numerous in similar covers on the Helmund and in Seistan around the lake.

They are hunted but not eaten. They do not appear to differ from the common wild hog of the Upper Provinces of India.²²

22. In Mr. Gray's catalogue of the specimens of mammalia in the British Museum, the "Indian wild boar" is styled *Sus indicus*: and Mr. Elliot had previously pointed out the following differences between it and the European one. "The Indian wild hog," remarks the latter naturalist, "differs considerably from the German. The head of the former is longer and more pointed, and the plane of the forehead straight, while it is concave in the European. The ears of the former are small and pointed, in the latter large, and not so erect. The Indian is altogether a more active-looking animal; the German has a stronger heavier appearance. The same differences are perceptible in the domesticated individuals of the two countries." (*Madr. Journ.* No. XXV, 219.) Vide Cuvier's 'Ossemens Fossiles', pl. lxi, for figures of the skull of the European boar, but which would seem to have been taken from a domestic individual.

In the Society's Museum are two very different forms of Indian wild boar skulls, especially characterized apart by the contour of the vertex and occiput. In a particu-

I heard of an animal, however, which had been killed near Washer, on the frontier towards Herat, and at the death of which my informant was present, which leads me to suppose (if the story be true,) that the "Babaroussa" (*Sus babaroussa*, Linn.), or some allied species, is an inhabitant of those parts. My informant was one of the party who accompanied the Candahar Sirdars as far as Washer, on their disastrous expedition against Herat in the years 1838-9. He described the animal as like a hog, with tusks and *two horns on the nose*; now the Babaroussa, according to Fred. Cuvier, has four tusks, two of which, by piercing through the skin of the muzzle, give the animal the appearance described by my informant. He declared, that it charged the party of hunters and overthrew a horse, but was shot and speared before it could do further injury. I have seen no spoils of the animal, and merely give the story as I heard it, from one who, by the way, was found in other respects, like most of his countrymen, to be an unblushing fabulist.²³

Wild hogs are plentiful in Scindh, and especially around Shikarpore.

No. 21. *Hystrix cristata*. Common Porcupine.

This animal is very abundant around Candahar and in the neighbouring districts; it hides in the deep fissures and caves which abound in the limestone ranges that divide the valleys, and issuing forth at night-fall, they commit sad havoc in the grain-fields and gardens. They are entrapped in pit-falls, and likewise shot. I once asked an Afghan if he would eat one, and he replied with a start of astonishment—"toba,

larly fine specimen, from Cuttack, measuring fourteen inches and a half above, along the mesial line to tip of nasal, and the lower tusks of which (withdrawn from their sockets) measure seven inches and a half long following their curvature, the vertex narrows posteriorly to an inch and three-eighths; whereas, in another skull of the same length, or a trifle longer, with lower tusks measuring six inches and a quarter, the vertex is two and a quarter across where narrowest, and the whole vertical aspect of the cranium is broader and more convex. Where the latter specimen was obtained I cannot learn; but I have seen others like it from Bengal and Arracan.

Wild hogs are very generally diffused throughout India, and they occur in the Himalaya at all altitudes. Mr. Hodgson informs us that there are not any in Thibet; but in the country of the Usbegs they would appear to be very numerous. Thus, Lieut. Wood, in his 'Journey to the Source of the Oxus,' mentions that—"Descending the eastern side of Junas Durrah, our march was rendered less fatiguing by following hog-tracks in the snow. So numerous are these animals, that they had trodden down the snow as if a large flock of sheep had been driven over it." They are also common in Persia, and in the countries eastward of the Bay of Bengal.—*Cur. As. Soc.*

23. Possibly a species of *Phachochæres*.—*Cur. As. Soc.*

toba, look at the animal's feet; do you not perceive the similitude to your own?" And he then proceeded seriously to inform me, that once upon a time, there lived a race of men so exceedingly wicked, that God at length laid his curse upon them and changed their forms to that of the porcupine, obliterating all trace of the human form divine, except the feet, which were left to mark the accursed and fallen race, and to serve as a warning to other evil doers. The hollow quills which form a tuft on the tail, are said, by the marvel-loving vulgar, to be used for the purpose of carrying a supply of water, but how the animal is to make use of the same is not stated; their true use, however, appears to be to give warning of approaching danger, and to alarm an assailant, as they emit a loud rattling noise when shaken.—"Sahee" of India.²⁴

No. 22. [*Alactaga acontium*, (Pallas): *A. indica*,²⁵ Gray, *An. and Mag. Nat. Hist.* Vol. X, 262]. The Jerboa. This beautiful little animal is abundant over all the stony plains throughout the country, burrowing deeply, and when unearthed, bounding away with most surprising agility after the manner of the Kangaroo. It was known throughout the army by the name of the Kangaroo-rat. They are easily tamed, and live happily enough in confinement if furnished with plenty of room to leap about. They sleep all day, and so soundly, that they may be taken from their cage and examined without awaking them, or at most they will half-open one eye in a drowsy manner for an instant, and immediately close it again in sleep. The Afghans call it "*Khanee*." It retires to its burrow about the end of October, and remains dormant till the following April when it throws off its lethargy and again comes forth. It is doubtless the "*desert rat*," mentioned by my friend the late Captain Arthur Conolly, in his *Overland Journey to India*, (page 54, Vol. 1.)

No. 23. *Gerbillus Indicus*. The Indian Gerbil.²⁶

24. The species of *Hystrix*, as the genus is now limited, are greatly in need of elucidation; I am of opinion, that several are at present confounded under *H. cristata* and *H. leucura*, and I have been endeavouring for some time past to collect more extensive data for determining those of India. The Afghanistan species, as figured by Burnes, has a black crest, and a much longer tail than the true *cristata*, or than either of the Indian species with which I am at present acquainted, which latter are at least two, if not three, in number.—*Cur. As. Soc.*

25. It certainly does not occur in "India."—*Cur. As. Soc.*

26. Two species of Indian Gerbils have been indicated, but their distinctions are by no means satisfactorily made out. Mr. Waterhouse, in *Proc. Zool. Soc.* 1838, p. 56, has endeavoured to characterize a *G. Cuvieri*, with tarse an inch and three-quarters long, though smaller than a specimen of *G. indicus*, in which the tarse measured but one

These beautiful field rats abound at Neemuch and about Muttra ; as likewise in the sandy tracts north of the city of Bhawulpore, where the country is absolutely riddled with their burrows. I think I have somewhere read that they live singly, i. e. that each pair is found separately and widely scattered over the plains ; but this is incorrect, for they form large colonies like rabbits, and live in regular warrens wherever they are located ; these colonies are usually situated in the neighbourhood of cultivation, which suffers much injury from their depredations. It has also been said that they do not venture out in the day-

and a half. He remarks, also, that "in the specimen of *G. indicus*, and that of *G. Cuvieri*, belonging to the Zoological Society's Museum, there is a considerable difference in the colouring, the latter being paler, and of a much brighter hue than the former ; but whether this difference is constant," he adds, "I am not aware."

Mr. J. E. Gray, in his 'Catalogue of the Mammalia in the British Museum,' identifies Mr. Elliot's *G. indicus* of S. India (*Madr. Journ.* No. XXV, p. 211), with the *G. indicus* of Waterhouse, but applies to it the name *Hardwickii* ; reserving the appellation *indicus* for some Bengal specimens presented by the late Major Gen. Hardwicke, while he makes no allusion to *G. Cuvieri* of Waterhouse, as if regarding this as a third Indian species, not in the British Museum collection. Specimens from S. India, however, presented to this Society by Mr. Walter Elliot, of the Madras C. S., (who also supplied the British Museum,) differ in not the slightest respect from at least one Gerbil of Lower Bengal. Of two specimens of the latter, from the vicinity of Berhampore, (for which the Society is indebted to the obliging exertions of my friends Capt. Thomas, 39th N. I., and Dr. Young,) and which accord in their general dimensions, one has the tarse to end of claws fully an inch and three-quarters, the other but an inch and five-eighths ; though the former is the more usual admeasurement in the full grown animal.

It would seem, however, that we have a second species in Lower Bengal, which I take to be *G. Cuvieri* of Waterhouse, and the skull of which corresponds exactly with that of Capt. Hutton's species, No. 24 : having the auditory *bullæ* considerably more voluminous than in *G. indicus*, and the incisive tusks larger and longer, and fronted with much paler enamel. Long ago, as mentioned in *Jour. As. Soc.* XI. 890, I found the remains of one of these animals in a paddy-field, half devoured by some carnivore : of this I preserved the skull, and what I could of the skin, with the tail and limbs ; but I unluckily gave the fragment afterwards to some *shikarree* who was to have endeavoured to procure others, but of whom I never heard again. At that time I had no suspicion of the existence of a second species of Bengal Gerbil, and it is only very recently that I have succeeded in procuring Bengal specimens of the other.

Captain Hutton's species, No. 24, agrees so very nearly with the common Indian Gerbil, that I can perceive no very satisfactory external distinctions. The tarse, however, to end of claws, of an adult male, barely exceeds an inch and a half long ; the general colour is also much paler, both of young and adults ; and the fur generally is longer, especially that growing on the tail : the anterior limbs are either white, or have but a faint tinge of colour ; whereas the hue of the back is, I think, always tolerably deep on the fore-limbs of *G. indicus*. The surface hue of the upper parts is of that light arenaceous, so very prevalent among the animals of Scinde and Afghanistan, as among those of Egypt and other sandy and stony countries.—*Cur. As. Soc.*

time, but this too is incorrect, for they may be seen the whole day through, popping out of their holes, nibbling the long grasses, and bounding off from hole to hole. This is the desert rat of Elphinstone's Cabul. (See Introduction.)

No. 24. *Gerbillus* [*Cuvieri* (?), Waterhouse.]²⁷ This species is plentifully scattered over the arid and stony plains of Afghanistan, but they do not form colonies like the last named. The Afghans call it "Juwee." A full grown male specimen measured nine inches, and the tail seven inches and a half, equal to sixteen inches and a half over all. This, like the last, although perhaps strictly speaking nocturnal, is nevertheless active during the day, popping occasionally out of its hole to feed. They form no colony, but are numerous scattered in pairs over the plains.

No. 25. *Gerbillus* [*erythroua*, Gray, *An. and Mag. Nat. Hist.* Vol. X. 266]. This likewise is abundant over the same tracts as the last, and goes by the same name; it is more abundant around Quettah, while the former affects the tracts around Candahar. All burrow in the ground, and are seen during the day at times. The nails of the feet in this last are black, but in the former (No. 24) they are white or colourless in living specimens.

N. B.—You will see one specimen of *Gerbillus* distinguished by a X on the enveloping papers, No. 25½. It is, I consider, the same as No. 25, the black colour of the nails being, however, the consequence of death, for in the living specimen they were colourless. Found in wide stony plains with the habit of the last.²⁸

No. 26. *Arvicola* [*Mus Huttoni*, Blyth.]²⁹ I am doubtful whether

27. Vide preceding note, No. 26.—*Cur. As. Soc.*

28. I do not think that it differs from No. 25.—*Cur. As. Soc.*

29. This belongs to a particular and very separable division of *Mus*, having much the appearance and also the habits of *Arvicola*. Among Indian species, it comprises the *M. giganteus* of Hardwicke, or great Bandicoot-rat, and the presumed *M. indicus*, Geoff. (*v. Arvicola indica*, Hardw., *M. kok* of Gray, and *M. (Neotoma) providens* of Mr. Elliot's catalogue.) The latter naturalist having expressed to me his intention of applying a particular name to this group, I shall not forestall him in so doing; but I entirely agree with him in the propriety of the separation. Mr. Gray (in *M. N. H.* 1837, p. 585,) regards it as the typical form of *Mus*.

In size and proportions the present species bears a near resemblance to *M. indicus* (*v. kok*), but the tail is shorter, and the general colour much lighter, resembling that of the Gerbils. On comparison of the skulls, the zygomatic arch is seen to be conspicuously broader anteriorly; and the palate is much narrower, and contracts to the front: but the most obvious distinction consists in all the teeth, both incisive tusks and grinders, being considerably broader and stronger. In other respects the skulls of

this is *A. indica* of Hardwicke or not. It occurs south of Bhawalpore, and is abundant in Afghanistan from Quettah to Girishk, throwing up the mould after the manner of the mole. It feeds on herbs and seed, and burrows in the ground beneath hedge-rows and bushes, as well as along the banks of ditches. Its nest is deep-seated, and it constructs so many false galleries immediately below the surface, that it is difficult to find the true passage to its retreat, which dips down suddenly from about the middle of the labyrinth above. In the gardens and along the sides of water-courses in the fields at Candahar, their earth-heaps are abundant.

No. 27. *Mus* [*bactrianus*, Blyth, *n. s.*]³⁰ This is the common house mouse of Candahar, but the house rat is I believe unknown there; at least so all my informants agreed in stating, and I certainly never saw one, although for two years I was in charge of extensive grain godowns, which would naturally have attracted them had any existed.

No. 28. *Lagomys* [*rufescens*, Gray, *An. and Mag. Nat. Hist. X*, 266.]³¹

these two species bear a very close resemblance. Length, minus the tail, about six inches: the tail (vertebræ) four: tarsus, with toes and claws, an inch and three-eighths: ears posteriorly half an inch; to anteal base three-quarters of an inch. Fur soft and fine, blackish for the larger basal half of the piles, the surface pale rufescent-brown, deepest along the crown and back, pale below, and whitish on the throat: whiskers small and fine, and chiefly black: tail naked: feet light brown: incisive tusks buff-coloured, the enamel of this hue partially worn away on those of the upper jaw.—*Cur. As. Soc.*

30. This little animal presents a very close approximation to *M. musculus* in size, proportions, and structure, inclusive of the conformation of the skull; but the fur is much denser and longer, and its colouring absolutely resembles that of a pale specimen of *Gerbillus indicus*, except that there is no whitish about the eyes, nor is the crown of a deeper hue, and the tail is thinly clad with short pale hairs to the end. Comparison of recent specimens would probably elicit some further distinctions from *M. musculus*, especially in the larger eye, and somewhat more produced muzzle; but I cannot venture upon describing such differences from a single skin. The entire under-parts and feet are white; and the upper parts light isabelline, with dusky extreme tips to the hairs, and their basal two-thirds deep ashy.—*Cur. As. Soc.*

31. Length about six inches: tarsus to end of claws an inch and three-eighths. The skull exhibits good specific differences from that of *L. Hodgsoni*, nobis, *J. A. S. X*, 816; being in particular much narrower between the orbits. Mr. Gray, in his 'Catalogue of Mammalia in the British Museum,' refers *L. Hodgsoni* to *L. Roylei* with a mark of doubt; and afterwards seems to identify it with *L. nipalensis*, Hodgson—a very different species; but the plates to accompany the descriptions of *L. Hodgsoni* and *L. nipalensis* were unfortunately transposed. *L. rufescens* exhibits the same sandy colouring so prevalent among the animals of Scinde and Afghanistan, and also those of Egypt.—*Cur. As. Soc.*

This species inhabits the rocks of Afghanistan from the Bolan Pass, where they were first seen, to Girishk and elsewhere northerly. They shelter beneath ledges of rock, and make their nests in the fissures, where it is next to impossible to get at them; and although I paid high for all specimens, and kept two men purposely to bring me the productions of the country, I only succeeded in procuring two examples of this animal, one of which escaped during the night; the other I send for inspection. It is probably the "Coney" of Scripture.³²

No. 29. [*Myospalax fuscocapillus*; *Georychus fuscocapillus*, Blyth, J. A. S. XI, 887.]³³ The Quettah Mole, as it was commonly called, is I think, a species of *Aspalax*; it burrows like the mole, throwing out heaps of earth. It is difficult to dig out, and is said to make long horizontal galleries, with earth-heaps thrown up at intervals. It probably feeds upon bulbous roots with which the plains around Quettah abound, such as red and yellow tulips, &c. I never saw or heard of the animal except around Quettah in the valley of Shawl, about 5,500 feet above the sea level, and I am indebted to the kindness of Lieutenant Holroyd, 43rd Light Infantry, for the specimens which are sent for inspection.

No. 30. *Lepus*————? Hares are common all over the plains, and I kept several tame ones at Candahar. I have, however, unfortunately lost my notes, and have preserved no specimen. It is said by several who have written upon Afghanistan, that there are two species, a large and a small one, the latter somewhat like a rabbit. I cannot positively deny the correctness of this assertion, although I have strong doubts on the subject; the small hares that I saw both at Quettah and Candahar, being nothing more than immature specimens or leverets of the same species, and I suspect that observers have mistaken the *Lagomys* for a small hare, an error by no means of infrequent occurrence. They are said to be remarkably strong and swift in some parts of the country, and the dog that can catch one single-handed, is reckoned a good one. Having neither notes nor specimens to refer to, I cannot pronounce upon the species, though it appears from memory to correspond with the

32. The "Coney" of our English version is, beyond doubt, the *Hyrax syriacus*, Schreber.—*Cur. As. Soc.*

33. This type differs from *Myodes*, or the Lemming genus, in the much greater size and strength of the feet, in the elongation and protrusion of its upper incisive tusks, &c. I will describe it more particularly with some other new rodents.—*Cur. As. Soc.*

common hare of the Deyra Dhoon. [*L. ruficaudatus*, Is. Geoff.] This, however, is conjecture. "Khur-gosh," i. e. *Ass-eared*.³⁴

No. 31.—*Bos bubalus*.—The Buffalo is scarce and does not occur wild; the few that are kept are evidently from the east of the Indus, and are precisely the same as the domestic buffalo of the Bhawalpore country, where they occur in immense herds along the banks of the Garra. There they are kept for the sake of the milk and ghee, and during the heat of the day they forsake the jungles and repair to the river, where they immerse themselves in the water, leaving only the head on the surface. I know not if it be the same as the Mysore buffalo, but it differs greatly in its horns from those commonly met with in our Provinces. They are of large size, chiefly black, sometimes with a white forehead and white tip to the tail, which reaches to the fetlock, hairy on the neck and shoulders; withers not raised above the rump. Some are dun-coloured, and among these, also, the white forehead is occasionally seen. Irides often white; forehead prominent; the horns in all curving up strongly and closely from the base, and forming a curl at the side of the head instead of lying back along the neck, as in those of the Provinces. The only domestic buffaloes that I saw in Afghanistan were a few kept at Candahar, for the sake of the milk and ghee.³⁵

34. From the skull of an immature specimen of the Afghan Hare in Capt. Hutton's collection, it is easy to perceive that the species differs from the northern Indian one: as is especially shewn by the greatly diminished horizontal elongation of the descending angle of the lower jaw, by the difference of the condyle, &c. It is only within a comparatively recent period that the common hare of Bengal and of the Upper Provinces has been recognised as a peculiar species by Zoologists. According to the observation of Mr. Vigne, it is remarkable that there are no hares in Kashmir. "One of the most singular facts connected with the natural history of the valley," writes that gentleman, "is that of there being no hares there. As a sportsman, I could not have believed it to be the case, as I have nowhere seen more likely ground. I am assured that they do not exist there, and I have never seen one myself, although I have traversed every quarter of the valley. It is probably too cold for the Indian hare; and that of the valleys of Thibet is an Alpine hare [*L. oistolus*, Hodgson, v. *tibetanus*, Waterhouse,] that has its dwelling amongst rocks, sand, and Tartarian furze. I should think that the European hare would thrive very well there."—*Cur. As. Soc.*

35. The above description applies better to the tame buffaloes of Italy and Hungary, than to those ordinarily met with in India; the former having besides a longer tail, and they are very commonly more or less marked and *splashed* with white. A skull of this race is figured in the '*Ossemens Fossiles*.' An Egyptian cow-buffalo which I saw in London approached more to the degenerate tame Indian breed, and had small, but elongated horns, similarly directed; and the late Mr. John Stanislaus Bell, (of 'Vixen' celebrity,) who favoured me with some interesting particulars respecting

No. 32. *B. taurus*.—The Cow is a handsome animal, and generally a good milcher; this is doubtless owing in a great measure to the rich artificial pastures on which they feed; the hump is generally reduced to an almost imperceptible rise at the withers, and in many it is not at all present. They are short-legged, and have good barrels, being altogether a far more European-looking breed than any native cattle on this side of the Indus. They do not appear to give the same quantity of milk in India, unless well fed.

No. 33. *B. pöepagus*.—The Yāk is seen to occur wild in the Huzara ranges, but for this I cannot vouch;³⁶ it has been said, by more than one traveller, also to occur wild in the higher parts of Kunawur and Tartary, and Lieut. Smith is quoted by Mr. Ogilby as having seen them wild on the confines of Bhootan; but these herds, I suspect, were nothing more than the tame yāks turned adrift, according to the custom during the summer, and left to roam at large until the winter sets in, when they are reclaimed and housed. The same custom may probably prevail among the Huzarrahs, and so have given rise to the tale of wild herds.³⁷ (Perhaps this is the "*Gow-cohi*")

many of the animals of Circassia, informed me, that the Circassian buffaloes "agree with the Italian in their bombed forehead, massive and ponderous conformation, and also in the abundance of excellent milk afforded by the female, often for two years; but the horns, especially those of the female, are very large, inclined backwards, much curved, annulated and serrated. The common attitude is that of the Indian buffalo, with the head horizontally held out; and the tail, with its terminal tuft, does not reach much more than half way to the ground. The young are of a dusky-brown colour; but the full grown are almost invariably black, without a spot of white. Their stature exceeds considerably that of the largest British cattle.

It should have been premised, that I furnished Mr. Bell with sketches from life of the Italian and common domestic Indian buffaloes, the principal distinctions of which races I pointed out to him, and this drew his attention to the minutiae which he has particularized. Certainly, the Italian tame buffalo is a very different looking animal from that of Bengal, and the buffalo of Afghanistan is evidently the same; but the Circassian would seem identical with the ordinary (and wild) Indian race.—*Cur. As. Soc.*

36. My friend the late Sir A. Burnes replied to my inquiries on this subject. "The Yak is, I hear, wild in Pamir, or some animal very like it."—T. H.

37. Various authors have mentioned wild Yaks, though some at least of them have been doubtless misled by the circumstance mentioned by Captain Hutton, of the tame herds being turned loose in summer upon the mountains. According to Lieut. Irwin, "Yaks are found in a wild state on the Pamir, and on the upper parts of Budukhshun." Mr. Vigne also informs us, that there are wild Yaks on the northern slope of the mountains towards Yarkund: and Timkowski mentions, that this species "is found, both wild and tame, in the western frontiers of China, in all Tangout and Thibet." So Captain Broome assured me, that he heard of wild Yaks being seen about Rodok, said to be in herds, and exceedingly savage and dangerous to travellers in the passes.

of the Persian physicians, also *Gowzen*; vide Cuvier's 'Synopsis Mammalium.')

No. 34. To the Horses I paid no attention, but believe there is no good breed proper to Afghanistan, or at least not in the neighbourhood of Candahar; all coming from other countries, as Herat, Toorkistan, &c.

No. 35. *Asses* are as common at Candahar as elsewhere, and do not differ from their brethren of other more civilised countries; they are used as beasts of burthen, and have no more mercy shown to them than elsewhere.

Of the many notices I have seen of the habits of this animal, one of the most interesting is that given by Lieut. Wood. "The Yak," he remarks, "is to the inhabitants of Thibet, and Pamir, what the Rein-deer is to the Laplander of Northern Europe. Like the Elephant, he possesses a wonderful knowledge of what will bear his weight. If travellers are at fault, one of these animals is driven before them, and it is said, that he avoids the hidden depths and chasms with admirable sagacity. His footing is sure. Should a fall of snow close a mountain pass to man and horse, a score of yaks driven ahead answer the purpose of pioneers, and make, as my informant expressed it, a 'king's highway.' In this case, however, the snow must have recently fallen, for when its surface is frozen over and its depth considerable, no animal can force its way through it. Other cattle require the provident care of man to subsist them through the winter; but the *Kash-gow* is left entirely to itself. He frequents the mountain slopes and their level summits. Wherever the mercury does not rise above zero, is a climate for the yak. If the snow on the elevated flats lies too deep for him to cross the herbage, he rolls himself down the slopes, and eats his way up again. When arrived at the top he performs a second somerset, and completes his meal as he displays another groove of snow in his second ascent. The heat of summer sends this animal to what is termed the old ice, that is to the regions of eternal snow; the calf being retained below as a pledge for the mother returning, in which she never fails.* * * The *Kash-gows* are gregarious, and set the wolves, which here abound, at defiance. Their hair is clipt once a year in the spring. The tail is the well known *choultry* of Hindoostan; but in this country, its strong, wiry, and pliant hair, is made into ropes, which, for strength, do not yield to those manufactured from hemp. The hair of the body is woven into mats, and also into a strong fabric, which makes excellent riding trowsers. The milk of the yak is richer than that of the common cow, though the quantity it yields is less."

It is a very prevalent opinion, that the Yak has never yet been taken alive to Europe. But Captain Turner long ago stated,—“I had the satisfaction to send two of this species to Mr. Warren Hastings, after he left India, and to hear that one reached England alive. This, which was a bull, remained for some time after he landed in a torpid and languid state, till his constitution had in some degree assimilated to the climate, [or had got over the effects of the long voyage,] when he recovered at once, both in health and vigour: he afterwards became the sire of many calves, which all died without reproducing, except one,—a cow, which bore a calf by an Indian bull. Though naturally not intractable in temper, yet soured by the impatient and injudicious treatment of his attendants, during a long voyage, it soon became dangerous to suffer this bull to range at liberty abroad, for which reason, after destroying a valuable horse, he was finally secured alone.”—*Cur. As. Soc.*

Dozens of these animals are driven into Candahar every morning during the fruit season, each carrying a pair of panniers loaded with grapes, figs, pears, peaches, apricots, nectarines, plums, cherries, green-gages, and melons. Latterly, also, from the difficulty and expense of procuring camels for commissariat purposes, we used to hire asses, and found them to be quick travellers, under loads of two puckah maunds each, (160lbs). The Bokhara breed is very large and often white. These animals are subject to swellings or tumours in the throat, from which secretions of lime are extracted, often as large as a pigeon's egg, and formed similar to the gravel stones in the human bladder. I send one for analysis.³⁸

No. 36. Mules are good, and often high-priced, especially riding mules, which sometimes sell from 250 to 300 Co's. Rs. each. I do not think any are bred in Afghanistan, but suspect they come from Mooltan and the Punjab.

No. 37. *Equus hemionus*. The Gorkhur, or wild Ass, I never saw, but it occurs in the southern deserts, and in Gurmsail; also in the neighbourhood of Herat and in Persia. It is difficult to capture alive. They occur also in Cutchee and in Guzerat. I heard a Bombay Engineer Officer state *as a fact*, which he backed moreover by the authority of Capt. Harris, of the same Presidency, (Author of 'African wild Sports') that *stallions* of the wild ass were very seldom met with, and the reason assigned was, that *as soon as the young one was born, the old stallion immediately castrated it with his teeth!!* This very marvellous story was evidently believed by the gentleman from whom I heard it, but I strongly suspect that if it really originated with Captain Harris, that Officer must have been quizzing. One very simple reason against the

38. Of this, Mr. Laidlay has favoured me with the following report:—

"The calculus submitted for examination weighed 237 grains, and had a specific gravity of 1.81. Exactly in its centre was found what appears to be the husk of some grain, (paddy?) which served as a nucleus around which the chalky deposit accreted in concentric layers. Its composition is

Carbonate of lime,	89.0
Carbonate of magnesia,	1.9
Phosphate of lime,	1.6
Animal matter (mucus and albumen,) ..	7.5

100.0

Corresponding with the ordinary composition of salivary concretions."—*Cur. As. Soc.*

truth of the story arises from the fact, that in newly born animals, the testicles are not apparent, nor do they drop for some time after their birth; nor is it at all likely that the stallion is in attendance as accoucheur, for the female knowing the propensity of the male to attack her offspring, would assuredly take the necessary precaution to prevent it. Besides, if this be the rule, the continuance of the race of wild asses, must be altogether fortuitous! The story speaks for itself; but I mention it as illustrative of what people, and clever people too, will swallow from the mouth of one supposed to be an oracle.³⁹ "*Ghorkhur*," quere from "*Ghora*," a horse, and "*Khur*," an ass, literally "*Equus Asinus*."

No. 38. *Cervidæ*. Of the true Deer there are none in the lower tracts of Afghanistan around Candahar, nor is there any cover for animals of this tribe, the whole country being a succession of bare hills and arid stony plains, with scarce a shrub of any kind larger than the camel-thorn. I was once informed, that the *Fallow deer* occurred near Herat, but acting on the hint and making every enquiry from competent authorities, I failed to get the least confirmation of the report, and believe my informant had never seen the fallow deer even in Europe.⁴⁰

It may not be amiss to say a word here regarding the *Hippelaphus* of Aristotle, which Mr. Ogilby has applied to the Nylghau (*Portax picta*). I should not have ventured on the subject had not that gentleman pointed to the modern Punjab, as *Arachosia*, which Aristotle gives as the habitat of *Hippelaphus*. Finding no other animal in the Punjab, to which the description will apply, Mr. Ogilby decided that the Nylghau

39. Aristotle, as quoted by Colonel Hamilton Smith, remarks of the common Ass, that the more powerful males thus attack the weaker, "*Tandiu illum persequuntur donec assecuti ore inter posteriora crura inserto testiculos ejus evellant.*" And for this reason, observes Colonel Smith, it is held dangerous to allow a male ass to pasture in the same field where there is a stallion. With the *Ghorkhur*, as with the Ass, the males fight with the teeth rather than with their hoofs; nor are they the only animals which evince a propensity for gelding their antagonist. Dr. Bachman relates the same of certain of the American Squirrels; and I have observed it in Shrews. There is an interesting notice somewhere in the '*Asiatic Review*,' of a number of *Ghorkhurs* taken in pit-falls in Scinde or Guzerat; among which, I think it is remarked that not a single entire male occurred. In a note to Vol. XI, p. 286, I expressed doubt respecting the alleged identity of the "*Kyang*" of Tibet with the *Ghorkhur*; but the Society has recently received (from G. T. Lushington, Esq., of Almorah,) a nearly perfect skin of a *Kyang*, which completely settles the question in the affirmative.—*Cur. As. Soc.*

40. There is a magnificent true Elaphoid stag in Persia, known as the *Maral*, of which a pair were taken to England by Sir John McNeill, and deposited in the Zoological Gardens.—*Cur. As. Soc.*

must be the species alluded to. To this view of the case, I have to offer the following objections and suggestions :

1st.—As regards the country called “*Arachosia*,” it would appear from various sources, and among others from Professor Lassen,⁴¹ that Arachosia was part of the country called “*Ariana*,” and situated in that part of Afghanistan of which Candahar is the capital. Such being the case, it is at once evident, that the animal alluded to by Aristotle under the name of Hippelaphus, could not have been the Nylghau, inasmuch as that animal does not anywhere occur within the limits of Afghanistan, and in all probability it does not even cross the Indus. The same remark will equally apply to the Saumer deer of India, and indeed to all the deer tribe, as none of them, as far as I could learn after two years’ inquiry, are found in that part of the country.⁴² It would seem proved, therefore, that neither the Saumer nor the Nylghau can be the Hippelaphus of Aristotle. Mr. Ogilby says, the name Hippelaphus is now applied to the Saumer, but in the English ‘*Régne Animal*,’ the specific title of “*Aristotelis*” is given to that animal. It is as yet undetermined, I believe, whether the Saumer and Jurrow are the same species or not, and until such is proved, the name of “*Aristotelis*” must apply to the latter deer.⁴³

41. Journal As. Soc. Bengal, Nos. 86 and 101 passim.

42. The ‘Arachosian Ox’ of Aristotle is, beyond doubt, the Buffalo.—*Cur. As. Soc.*

43. Vide *Journ. As. Soc.* XI, 449, for some remarks on this subject, which further observation has confirmed, as regards the distinctness of the ‘Jurrow’ (*C. Aristotelis*), the ‘Saumer’ (*C. hippelaphus*, Cuv.), and the Malayan Rusa (*C. equinus*, Cuv.) The *Jurrow* is peculiar to the Himalaya, and its antlers are always much larger, and more divergent than in the others; and the prongs composing their terminal fork are generally about equal in length; sometimes the inner and sometimes the outer, being the longer. In the *Saumer*, which inhabits Bengal, Arracan, and the hill forests of Peninsular India (it being doubtless also the Cingalese species), the antlers very rarely, if ever, exceed two feet and a half in length, and are much less massive than those of the *Jurrow*; of the prongs of their terminal fork, the outer is usually the longer. In the Malayan Rusa, inhabiting the Malay Peninsula and Java, the contrary obtains; the inner prong being usually *much* the longer, and the reverse of this is observable in a still greater degree in the common Axis or spotted deer. In addition to series of each of the above in the Society’s museum, are three pairs of antlers of a Rusa, now common in the Mauritius, and which nearly resemble those of the Malayan *C. equinus*, but are remarkable for a strong sigmoid flexuosity of the beam. There are also two frontlets from Assam, which seem to be referrible to the *Saumer*, having the antlers unusually robust but short, and (as in ordinary *Saumer*) much less divergent than those of the *Jurrow*.—*Cur. As. Soc.*

2nd.—From Aristotle's description of the animal, and the habit furnished by him, as well as from Mr. Ogilby's remarks thereon, I would beg to suggest, that the *Hippelaphus* is nothing more than the "*Capra ægagrus*."

I found this opinion on the following facts, namely :—

1st.—*Hippelaphus* inhabits the country of Arachosia, in which the *C. ægagrus* abounds, but where neither the Nylghau nor the Saumer occurs.

2nd.—"The *Hippelaphus*," says the Greek philosopher, "has a mane (like a horse) above the shoulders, but from this to the head, along the top of the neck, *it is very thin*; it has likewise a *beard on the larynx*; it is about the size of a stag—the female has no horns—those of the male resemble the horns of the *Dorcas* (*Gazella dorcas*) :—it inhabits Arachosia." (Royle's *Him. Bot., Mamm.*, p. 74.) Now a reference to the figure of *C. ægagrus* given in the '*Calcutta Journal of Natural History*,' No. 8, will show the *mane* and *beard* alluded to by Aristotle; in the figure, however, the hair on the shoulders or withers is not represented long enough, nor so thick as in the living animal. This animal therefore possesses precisely such a mane as Aristotle describes, it being longest on the shoulder and growing thinner and shorter towards the head: it has likewise a long and bushy beard depending from the throat.

Mr. Ogilby, after declaring that it can be easily proved, that the *Dorcas* is the Gazelle of Egypt, goes on to say that—"Theodore Gaza, himself a Greek, and *the first translator of Aristotle*, very properly renders the word by *Capra*." Here then is a corroboration of my opinion, for according to Aristotle and his first translator, the *Hippelaphus* inhabited Arachosia, i. e. Candahar; it had a mane and beard; so has *C. ægagrus*: it has horns like the *Dorcas* or *goat*; *C. ægagrus* is a horned goat. The only dissimilitude is in the female having *no horns*, whereas all the specimens I have seen of the female *ægagrus* were horned. Even this, however, is in a measure nullified by the statement in the English *Régne Animal*, that the female has "*short or no horns*." If, therefore, the horns are sometimes wanting, it may have been from a hornless specimen that Aristotle's description was drawn up.

The *Capra ægagrus* will consequently be found in every respect to answer the description of *Hippelaphus*, both as to its appearance and habitat; while in the latter respect at least, neither the *Portax picta* nor

any of the Rusa tribe, can possibly agree, for none of them occur across the Indus or in Arachosia. The only wild ruminants that I could hear of in the country, were *C. agagrus*, *C. megaceros* (nobis), *Ovis Vignei* (Blyth), *Gazella subgutturosa*, and in Cutchee and Upper Scindh, west of the Indus, the *Cervus porcinus*, *Gazella Bennettii*, and *G. Christi*. To none of these, with the exception of the first, can the description above quoted apply; and if it be rejected, then there remains no animal in Arachosia to which we can refer that notice. In the 'Penny Cyclopædia,' art. Ariana, we are informed that "Ariana was the general appellation given by ancient authors, subsequent to the age of Alexander the Great, to the eastern portion of those countries which form the highland of Persia. According to Eratosthenes, Ariana was bounded on the north by the Paroparmisus mountains, and their western continuation as far as the Caspiæ Pylæ; on the south by the great sea (the Indian Ocean); on the east by the river Indus; and on the west by the chain of hills which separate Parthyene from Media, and Karmania from Paraitakene and Persis. Its shape is by Strabo compared to that of a parallelogram, the dimensions of which, reckoned from the mouths of the Indus to the Paroparmisus, he estimates at 12,000 or 13,000 stadia; and in a straight line from the upper Indus to the Caspiæ Pylæ, on the authority of Eratosthenes, at 14,000 stadia; the length of the southern sea coast from the mouths of the Indus to the entrance of the Persian Gulf is stated at 12,900 stadia. The countries properly belonging to Ariana are, according to Strabo, in the east, the Paroparmisadæ, the Arachoti, and Gedroseni, along the Indus proceeding from north to south; the Drangæ towards the west of the Arachoti and Gedroseni; the Aarii towards the west of the Paroparmisadæ, but extending considerably to the west and south, so as nearly to encompass the Drangæ, the Parthyæi west of the Aarii, towards the Caspiæ Pylæ; and Karmania to the south of the Parthyæi."

From this it becomes abundantly evident, that Mr. Ogilby is altogether wrong in placing the modern Punjab within the ancient Arachosia, and consequently that his views with regard to the identity of *Hippelaphus* and *Portax picta* or Nylghau, are wholly inadmissible.

If therefore we reject the *Capra agagrus* as Aristotle's *Hippelaphus*, the matter is left in more doubt than ever, for there is now no other

ruminant inhabiting Arachosia to which his description can possibly apply.

No. 39. *Cervus porcinus*. Hog deer—Parah. This species occurs abundantly in the preserves at Shikarpore, and is also found in the jungles of the Bhawalpore territory. While returning to Ferozepore by water from Sukkur, I saw a hog deer some miles below *Ooch*, suddenly spring off the bank into the river, and strike out for the opposite shore; shortly afterwards, the reason for this was apparent, as a common village dog took the water at the same place in pursuit of the deer. The river was here very broad, and must have been close upon two miles across as the animals were steering; the deer made good way, and kept well up against the current, which was running strong; the dog seemed tired and was carried far down the stream, and while he was still struggling in the middle of the river, the deer had gained the shore and galloped off to the jungle. I did not see whether the dog got across or not, as a turn in the river shut him out from view.

This animal does not occur in Afghanistan.

No. 40. The Nylghau—*Portax picta*. This is said to be found in the northern portion of the Bhawalpore country. It is not found in Afghanistan.

No. 41. *Antilope cervicapra*—Sarsinee, or Indian Antelope. It is said to occur in the northern portion of the Bhawalpore country, but does not appear to cross the Indus, and none are found in Afghanistan. It is common in the Upper Provinces of India and also at Neemuch. I do not think that this species is an inhabitant of the countries west of the Indus, and in Cutchee it appears to be replaced by the *Gazella Bennettii* and *G. Christii*, while again these two do not cross the mountain barrier into Afghanistan, but are there represented by *G. subgutturosa*, which extends into Persia. If this conjecture be true, it is probable that *A. cora* and *arabica* are distinct from *A. Bennettii*? This is hazarded however as a mere surmise.

No. 42. *Gazella Bennettii*—Ravine deer. Goat-antelope of Europeans; “*Chikara*” of Neemuch; Kalseepie of Mahrattas. *Gazella Cora*? *Antilope Arabica*?

This species is abundant at Neemuch, where it roams over the wide and sterile plains in small groups of five and six. The natives there call

it "Chikara" or "Shikara," a name which is elsewhere applied to the Four-horned Antelope. The female has horns, but these are very short and slender, and invariably crooked in growth; they are blackish and smooth, with slight indications of wrinkles at the base. The same species likewise occurs in Cutchee, but does not pass the mountains into Afghanistan.

No. 43. *Gazella Christii*, Gray.—This species approaches very nearly to the last named, and occurs in Cutchee also, but not in Afghanistan. A fine specimen was brought to me at Dadur, and the skull was carefully preserved and brought to this country with my other collections; but since my arrival at Mussoorie it has most unaccountably disappeared.⁴⁴

No. 44. *Gazella subgutturosa*.—The *Ahu*. (N. B. The word "*Ahu*," though applied to this species by the Afghans, is used only as a generic term; the specific name I cannot now remember, and my note is mislaid.)

Although I have referred the Afghan Gazelle to *G. subgutturosa*, still I do so with diffidence, on account of the remarkable difference between the horns of my specimens and the figure of a skull given in the English 'Régne animal.' In that work the horns bend *outwards* at the tip, and it is said in the text that such is their direction in the Persian *Antilope subgutturosa*. I am strongly inclined to think, that the horns on the skull figured in the 'Régne animal' have been transposed, namely, the right horn on the left core, for if they were again changed they would exactly represent the horns of the Afghan species. In my largest specimen the horns are fourteen inches long measured over the curve; they have twenty annulations, and are seven inches and a quarter apart at the tips, which turn inwards and almost form a hook; indeed, with the exception of the above difference in the direction of the horns, the two animals precisely correspond.⁴⁵ The *Ahu* of the Afghans is found from Quettah to Candahar and Girishk, and it probably extends thence viâ Herat into Persia; they are found in small flocks of six or seven, and roam over the wide and sterile plains of Afghanistan, occasionally committing great havoc in the grain-fields.

I do not know whether it extends upwards to Cabool, though such is probably the case, as I heard of its occurrence near Ghuznee. In the

44. For some notice of this species, vide XI, 452.—*Cur. As. Soc.*

45. The horns are those of a typical *Gazella*, rather stout, and abruptly hooked in at the tip.—*Cur. As. Soc.*

winter time they travel further south, and skirt the sandy desert which stretches along from the Sooliman ranges into Persia.⁴⁶

In the young males, the horns nearly touch at the apex in consequence of their inward turn, but they afterwards separate and diverge as the animal advances to maturity.

As regards the female, however, if mine be in reality the Persian Gazelle, there is still greater difference between the Afghan species and the published description in the English edition of Cuvier's 'Régne Animal;' for it is there stated, that "the females have smaller horns, and are destitute of lachrymary sinus and of tufts on the knees;" In the Afghan Gazelle, on the contrary, the female is *hornless*; she has a *lachrymary sinus* as well as the male, and she has tufts at the knee, although they are perhaps smaller than in the male. In all other respects of marking, colour, &c. the description of Cuvier corresponds with my specimens, which I can regard as none other than *G. subgutturosa*, and I conclude that some mistake must have led to the erroneous account in the English 'Régne Animal.' I am the more inclined to believe this, since I find an equally glaring error regarding the "*Goral*" (*Kemas goral*), it being stated that the female is *hornless* and possessed of only *two mammae*, whereas she has *horns* (generally), and *four mammae*!

The Afghans have a mode of catching or destroying these animals when they repair to a river to drink; a net is erected along the bank of the stream, and a single opening is left for the antelope to enter at; after satisfying their thirst the animals proceed to wander along the stream, and the ambushed hunters springing up and securing the opening or door way of the net, capture or kill the whole batch. The carcase was often brought into the market at Candahar and sold.

No. 45. *Ovis Vignei*. "Koh-i-doomba" of the Afghans—*O. cycloceros*, Hutton.

When I named this species, I was not aware that it had passed through abler hands, but of course my trivial name must give place to yours. I have nothing to add to my former account in the 'Calcutta

46. M. Menetries remarks, that this animal "is very common in winter on the vast Steppes which border the Caspian sea, from Bakou to Koo; living in small troops, which once a hundred and fifty paces from the hunter, remain tranquil and fearless. It is easily tamed, so that it may be suffered to run at large without danger of losing it."—*Cur. As. Soc.*

Journal of Nat. Hist.' The animal is abundant throughout the higher mountains of Afghanistan and is said to extend into Persia.⁴⁷

No. 46. *Ovis steatopyga*—Var.—“Doomba,” or broad-tailed sheep.

The domestic sheep of the Afghans are all *Doombas* or “broad-tails,” but the development of this singular feature is dependent apparently upon climate and perhaps pasture, although certainly not to such an extent as some have supposed: for instance, Pallas ascribes it to the prevalence of wormwood in the pastures, but if such be the cause the feature should become larger or smaller according as such pasture abounded or decreased; why then have the sheep around Shawl and among the tribes which frequent the mountains of the Soolemaun range a *less* development of fat than those sheep which are found around Candahar, for wormwood and saline soils abound there? why again have the sheep of the Khyber Pass and Peshawur the broad tail, for wormwood I am told *does not occur there*? why have not the sheep of Upper Kunawur and Hungrung in the Himalaya, the broad tail, for wormwood *abounds* there, and forms one of the chief plants in the pasture of those elevated tracts?

The “Broad-tailed Sheep,” which is but a variety of the “Fat-rumped” species, or “*Ovis steatopyga*,” occurs throughout hill and vale, extending into Bokhara, Persia and Palestine; it occurs also with some modification in Africa and elsewhere. If the prevalence of wormwood and saline pastures had the effect of producing the broad fat tail of this breed, so ought they to have enlarged the tail of the wild race (*Ovis Vignei*), and the Camels and other cattle which feed upon the same pastures; yet such is not the case.⁴⁸ Again, if the fat is engendered by such causes, it should disappear gradually when the exciting cause had ceased to operate, and by removing the *O. steatopyga* to pastures where neither wormwood nor saline plants prevail, the singular enlarge-

47. There is a brief notice and very passable figure of this species, taken from an animal killed in the vicinity of Persepolis, in Lieut. Alexander's ‘Travels from India to England,’ &c., p. 136 (1827); and I may take the present opportunity to remark, that the Society is indebted to the obliging exertions of G. T. Lushington Esq., of Almorah, for a noble specimen of the true *Ovis ammon* of Pallas, which is quite distinct from *O. montana* of N. America, and to which must be referred my *O. Hodgsonii*, founded on Mr. Hodgson's figure and description of the head and horns of a young ram, since called by him *O. ammonoides*.—*Cur. As. Soc.*

48. The fighting rams of India seem to me to be of a race descended from *O. Vignei*, of which they preserve the crescent-horns and short tail.—*Cur. As. Soc.*

ment of its tail should disappear and become as in other breeds. This however is also not the case, for the doomba has long been tended in different parts of India and other countries without a reduction in the size of the tail, which still continues enlarged as in the original stock. This fact, therefore, goes directly to establish the *O. steatopyga* as a *distinct* and *original species*, which has descended from none of the living stock, whether domesticated or in a state of nature.⁴⁹ Let us examine the grounds on which this opinion can be maintained. First, we find that sheep taken to the pastures of the broad-tails, do not gain an accession of fat on the rump and tail, but remain precisely as they have always been. Secondly, the broad-tails, when removed from their own pastures, do not lose the singular feature from which they take their name. Pasture, therefore, is clearly not *the cause* of this enlargement. Thirdly, proofs may be given that the *O. steatopyga* is the original breed confided to the care of men even from the dawning of his abode on earth. It is however contended, that all our domestic stock has sprung from some one of the existing wild races, and as regards the Sheep, the Musmon (*O. musimon*) is supposed to be the origin of our flocks.⁵⁰—Now, if we are to attend strictly to the *generic characters* assigned by naturalists to the Musmon and our Sheep, we shall at once perceive the absurdity of assigning such an origin to the latter species,—for while all accounts agree that the true Sheep possess “*no lachrymal sinus,*” and that they have *an interdigital hole or sac;*” the Musmon has actually been removed from the genus and ranked as a *Goat* by no less authority than C. L. Bonaparte, the present prince of Canino, because that animal *does possess a lachrymal opening,*⁵¹ and because it possesses *no interdital hole!*

If the absence of a lachrymary sinus in the domestic sheep *were true*, which it is not, the want of it would prove that none of the wild

49. Certainly not an aboriginal race, but one highly altered by domestication.—*Cur. As. Soc.*

50. Whether any long-tailed sheep, with horns describing more than a spiral circle, could have descended from the crescent-horned and short-tailed *O. musimon* (which is closely allied to *O. Vignei*), is extremely doubtful.—*Cur. As. Soc.*

51. The presence of a lachrymary opening proves, however, that it is not a Goat, because that genus does not possess it. T. H.—If I mistake not, (writing from memory,) the Prince of Canino states, that the *lachrymary sinus* is wanting in the Moufflon, as it is certainly is in *O. tragelaphus* and *O. nahoor*; whereas I believe all sheep possess the interdital sinus (an easy mode, by the way, of distinguishing a leg of goat-mutton from one of *mouton proprement dit*).—*Cur. As. Soc.*

sheep known to us could have furnished the original stock, for all of them possess that character ;—the assertion, however, that the genus *Ovis* does not possess the lachrymal sinus is erroneous, for both the broad-tails and every other domestic variety that I have seen, decidedly possess it ; it varies in size in different breeds, but I will venture to assert that it will always be present. Still, notwithstanding the occurrence of a sinus both in the musmon and domestic sheep, the latter must nevertheless be a distinct species, because it possesses a character common to all sheep, but which in the musmon is wanting, namely, the interdigital opening sac.

Having given proof therefore that our domestic flocks have not been derived from the musmon, I shall now endeavour to establish my third position, by proving that that the *Ovis steatopyga* is a remnant of the original breed confided to man in the infancy of the world. I have already said, that I am inclined to think the *Ovis steatopyga*, with its varieties, as altogether distinct from the races now living in a state of freedom, and in this opinion I shall now attempt to trace back its origin from the earliest to the present time, leaving it to others to form their own conclusions from the facts here brought to their notice.

The earliest mention made of man's possessing flocks is in the 4th Chapter of the Book of Genesis, where, at the 4th verse we are informed, that Abel "brought of the firstlings of his flock," as an offering to the Lord.

Since then, at this early period, a sufficient number of animals were domesticated to enable man to offer up the daily sacrifices which it appears was then the custom, and since, moreover, we know that the animals were created especially for man's use and comfort, it is evident that some of the more useful races must have been placed from beginning under his controul as domestic stock, for it is clearly impossible that he could, by any exertions of his own, have captured and subdued a sufficient number of the wild mountain breeds, at the period alluded to, to enable him to offer up such sacrifices.

In this case, such cattle would necessarily have descended from generation to generation, even to the period when God commanded Noah to build the Ark, and they consequently formed part of the stock preserved alive with him, and became the foundation of his domestic flocks after the flood, and were diffused again with his descendants from the coun-

try where the Ark rested. They were therefore part of the stock which Abraham and Lot possessed, and which, after them, Jacob tended while serving Laban for his daughter Rachel. This opinion seems moreover to be well supported by the fact, that the general colour of the breed is the same now as in that early period; for we read that Jacob's hire was to consist of all the ring-straked, speckled, and spotted among the goats, and of all *the brown among the sheep*; and it is easy therefore, without the aid of a miracle, to see how his flocks increased while those of Laban diminished; since to this day, there are few domestic goats without some speck or spot of white, and since the prevailing colour of the Tymunnee broad-tailed sheep is brown of various shades!

It was indeed an arrangement well calculated then, as it would be still, to enrich the one party and impoverish the other, and if we only allow that Jacob was an observing shepherd, and had learned by experience that "*like breed like*," the secret of his great success is at once made manifest.

With Jacob therefore and his sons, they were taken up into Egypt in the time of the famine under Pharaoh's reign, when the land of Goshen was allotted for a residence to the Israelites; and of course, from thence they accompanied that people throughout their wanderings into the promised land, after the Exodus from Egypt, and from thence again they became diffused through all the neighbouring states and kingdoms: unless, indeed, as is most probably the case, they occurred there already, as the nations which were then in the land had equally with the Israelites descended from the Ark.⁵²

Now, that the sheep known to the Jews was the *Ovis steatopyga*, would seem to be amply proved from the 29th Chap. of Exodus, where, at the 22d verse, in describing the manner of a certain sacrifice to be offered up, it is written, "thou shall take of the ram *the fat and the rump*, and the fat *that covereth the inwards*, and *the caul above the liver*, and *the two kidneys*, and *the fat that is upon them*, and the right shoulder; for it is a ram of consecration."

Here there is evidently a marked difference made between the fat of the tail and the fat of the inwards and kidneys, for the words "the fat

52. So, Captain Hutton might also argue, are the aborigines of both Americas, of Australia, Polynesia, and the countries generally to the E. and SE. of the Bay of Bengal, in which latter Sheep have only recently been introduced, and are as yet possessed wholly by the European residents.—*Cur. As. Soc.*

and the rump," clearly show that they were distinct parts of the animal, otherwise it would have been written, "*the fat of the rump.*"

It is likewise held distinct from the fat of the other parts, as "the fat of the inwards" and "the fat of the kidneys." Now it is a notorious fact, that the fat here mentioned is literally all that the animal possesses, unless kept up and fed with grain, which Asiatics never do; so that the passage reads "the fat *tail* and the rump," &c. We have consequently a true description given us of the "*Ovis steatopyga*," in which there is "a solid mass of fat on the rump, which falls over in the place of a tail, divided into two hemispheres, which take the form of hips with a little button of a tail in the middle."⁵³

Again, all doubt upon the subject appears to be removed by a passage in the 3d Chap. of Leviticus, where, at the 7th and following verses, in explaining the method to be adopted in "offering up a sacrifice for a peace offering," it is written—"If he offer a lamb for his offering then shall he offer it before the Lord. And he shall offer of the peace offering an offering made by fire unto the Lord; the fat thereof *and* the whole rump, it shall he take off hard by the backbone; and the fat that covereth the inwards, and all the fat that is upon the inwards, and the two kidneys, and the fat that is upon them, which is by the flanks, and the caul above the liver, with the kidneys, it shall he take away."

Here then it will be observed, that not only is the distinction between the fat of the hinder parts, and of the inwards again repeated, but we are instructed more particularly that the tail was the part alluded to, since "the fat thereof *and* the whole rump," were to be taken "*off hard by the backbone*," thus clearly pointing out the part where the fat alluded to was situated, namely, in the rump and tail, which takes its origin from, or is a continuation of, the end of the backbone.

It must farther be remarked, that the word "*and*," written in italics in the Bible, does not occur in the original Hebrew, but has been added in the English translation in order to show the connection of the words "*the fat thereof*," with those of "*the whole rump.*" Therefore, in the original, the passage would stand thus—"the fat thereof, the whole rump, it shall he take off hard by the backbone;" and that the fat rump of the sheep is the part alluded to is clearly proved by the word

“*it* ;” otherwise if “*the fat thereof*,” and “*the whole rump*,” had been separate parts, they would not have been specified in the singular number, by “*it shall he take off*,” but by “*them shall he take off*.” We thus at once perceive, that the allusion is made to the peculiar formation of the hinder parts of the “*Ovis steatopyga*,” in which the fat of the rump actually descends in two lobes on either side of the tail, which it so completely envelopes as to leave only the tip of it apparent, and thus while it contributes to form the broad tail which characterises the species, it still remains likewise a part of the rump, commencing at the end of, or ‘*hard by the backbone*,’ as correctly alluded to in the above passage of Leviticus.

Further evidence, if such were necessary, may be probably gathered from other passages, such as that of the 15th Chapter of Samuel, where the prophet in reproving Saul, declares to him, “*behold, to obey is better than sacrifice, and to hearken than the fat of rams*.” Now, since the Asiatic sheep are notoriously devoid of fat, unless kept up and fed, the repeated mention in the Scriptures of the fat of rams, would seem to point most particularly and plainly to the species under consideration, which thus becomes doubly interesting, as being not only an Antediluvian species, but a descendant from the original stock bestowed upon mankind by the Almighty in the earliest ages of man’s existence upon the earth, and as being moreover the animal which was used in the ancient sacrifices of the Jewish people.

Thus we perceive, that so far from this animal having sprung from any living wild breed, it is in all probability the most ancient of all our sheep, and the stock from which the numberless domestic varieties which now contribute to the comfort of mankind, have themselves descended.⁵⁴

In the same manner it might be urged, that as from the earliest periods after the flood, we read in Scripture of camels, asses, oxen, sheep, goats, pigeons and doves, being in a state of domestication, a strong probability would seem to rise that all these species had been reserved to himself by man from the period of the descent from the

54. Capt. Hutton has, at least, here shewn satisfactorily, the great historical antiquity of the Doomba race of domestic sheep, by proving it to be the variety (and it would seem the only variety, as to this day in Afghanistan,) tended by the Hebrew Patriarchs, and familiarly referred to in the Mosaic writings.—*Cur. As. Soc.*

Ark, and therefore that none of them have now, in a state of freedom, the original stock from which they sprung.

It should also be remembered, that if the animals at present distributed over the earth, *are all to be considered as having descended from the Ark*, (which I deny,) we ought rather to seek among our domestic breeds for the original stock from whence they have become diffused, than that the converse should be the case; for it can scarcely be supposed with any show of reason, that man, who had once held every species in captivity under his immediate controul, would have suffered them to escape and roam over various quarters of the earth, until they had become wild and difficult of approach, and that then he should have turned his attention to the means of recapturing and reducing them again to subjection.—If, therefore, any of the existing wild breeds of oxen, sheep, or goats are identical with our domestic species, (which is not proved,) it should rather be supposed that the *former* had descended from the *latter*, and that they gained their freedom after the flood, when the then existing families of men had selected from among them a sufficient number to serve as the foundation of their domestic flocks and herds.⁵⁵ But as the Scriptures declare, that only *seven pairs* of each of these animals were preserved alive, and as we read that some of each kind were sacrificed by Noah on his descent from the Ark, it becomes very improbable that any of them regained their freedom, and consequently the domestic breeds of camels, goats, asses, oxen, sheep, and some others have descended from stock which lived before the flood, either wild or in a state of domestication. Therefore, we perceive that neither can our domestic breeds be traced to any of the wild stock of the present day, nor can the latter be traced from them; and the wild races are consequently distinct as species, and have been created since the flood;—of this however more will be said elsewhere.

The treatment of the flocks in Afghanistan appears in many respects very similar to European methods. One ram is reckoned sufficient for a flock of a hundred ewes. At the rutting season the ewes are kept in an enclosure and passed to the rams until all are served, the shepherd assisting in the operation by holding up the tail, without which it

55. The writer of the article 'Sheep,' in the 'Penny Cyclopædia,' alludes only to the Moufflon and Argali (*O. musimon* and *O. ammon*,) among wild races; absolutely stating of them, that "They are descendants of those which have escaped from the dominion of man, and are retreating from desert to desert in proportion as the population of the country increases." !!—*Cur. As. Soc.*

is asserted the animals cannot consummate. When all have been passed to the male in succession, the rams are turned in with them, and should any ewe have been passed over or not served, the ram detects her by the scent. The rams selected to serve are fed up with barley and melon-rinds, and in the autumn, which is the rutting season, they are rendered furious with lust. Another mode of treating them is, to turn the rams out with the flocks in the autumn time, when those ewes which are ready for the male will leave their food and follow him about, upon observing which, the shepherd separates them and puts them to the serving ram.

In the spring months, the young are yeaned at the very season when the grass is again springing up. Some females come in heat after yeaning, but they are never served then, because the young would be dropped at the end of the year when the grass is fading: when the lambs are born, the mother is milked to prevent the lamb from tasting the first milk, which the Afghans reckon to be injurious;⁵⁶ after this the lambs are allowed to suck sparingly in the morning and evening, and after the third day, they are all flocked together during the day, and only allowed access to the mothers at sucking-time; the surplus milk is manufactured into *croot* and *ghee*, as cows' milk is not much esteemed by the Afghans. If the rains of winter have been plentiful and the spring grass is in consequence abundant and rich, the lambs are allowed to suck for four months, as the milk is good; but if the contrary has been the case, the lambs are taken up at three months old, in order that they may not weaken the mother.

I was informed by a person who possessed large flocks, and who had no reason to deceive me, that sometimes the tail of the Tymunnee doombas increased to such a size, that a cart or small truck on wheels was necessary to support the weight, and that without it the animal could not wander about; he also declared that he had produced tails in his flock which weighed twelve Tabreez-i-munds or forty-eight seers puckah, equal to about 96lbs. It has been remarked by Fred. Cuvier, that the fat of these tails, when melted, does not return on cooling to the state of fat, and this assertion is a fact well known to the Afghans, who sell and use it mixed with the ghee formed from milk. Some objections were on this account offered to the ghee by our sepahes, but their scruples soon vanished.

56. The reverse is the opinion in Europe.—T. H.

For particulars regarding the wool of these sheep, I must refer the reader to a former paper, published in the Journal of the Asiatic Society of Bengal, No. 99, and likewise to some very pertinent remarks by Dr. Griffith, in the 120th No. of the same Journal.⁵⁷

No. 47. *Capra megaceros*, (mihi. For remarks on this species, see McClelland's 'Journal Nat. Hist.')

This I consider to be a true wild species, and not an accidental race as you suppose. It is the "Markhore," or snake-killer of the Afghans.⁵⁸

No. 48. *Capra agagrus*: "Booz," of the Afghans: Ibex, of writers on Afghanistan.

I have nothing to add to my former notice of this animal in McClelland's 'Journal Nat. Hist.:' the experiments, however, which I was making on the cross between it and the domestic goat, have all failed hitherto, in so far as the production of offspring, *inter se*, is concerned. I brought from Candahar a half-bred female, the produce of a wild female by a domestic male; this female was again crossed by a tame goat, and brought forth two fine male animals, by one of which she subsequently had kids which lived and grew up; none of her offspring however, have as yet bred *inter se*, and most of them, together with the half-bred mother, are now dead; I have still a few of the young ones left, and shall notice any produce that may occur from them. As yet, however, we have gained nothing in regard to the opinion that the *agagrus* is the original stock from which our domestic breeds have

57. They are sometimes four or five-horned, but this is only an exception, not a general rule, as some accounts would have us believe.—T. H.

58. In my description of the spiral horns of this animal, *Proc. Zool. Soc.* 1840, p. 80, I made a grand mistake in stating the spirature to be inwardly directed, as in all spiral-horned domestic goats; the fact being, that in the *Markhore*, as in every other species I know of, which has spiral horns in its natural wild state, (e. g. the Indian Antelope, the Addax, Koodoo, and Caffrarian Impoof,) the twirl is in the opposite direction. Capt. Hutton mistook my meaning in his remarks, (*Cal. Journ. N. H.* II, 541,) upon the "inward tendency, at least at the tips," which I mentioned as being almost invariably observable in the endlessly diversified races of domestic goats; supposing that I intended the convergence generally observable towards the tips of the long arched horns of the majority of wild *Capræ*,—a character of very trifling importance, even if constant, which it is not. And I may here also remark on the subject of the Himalayan Ibex (*Capra sakeen*, nobis), of which my notice was briefly commented upon by Capt. Hutton, that, in addition to the differences which I indicated as distinguishing its horns from those of the Swiss Ibex, the existence of a well developed beard (four inches long, in the head of a young male in the Society's Museum,) affords a conspicuous differential feature; for the beard of the Swiss Ibex is constantly reduced to the merest rudimentary tuft, such as would remain unnoticed if not specially looked for.—*Cur. As. Soc.*

sprung, but as far as experiments have been carried, strong doubts arise in my mind as to the correctness of such a doctrine.⁵⁹

No. 49. Domestic goats. The domestic Goats of the Afghans are chiefly long-haired, with an under-coat of fine soft down. They very much resemble the Goats of the lower Himalaya and Kooloo, and appear to be a degenerate breed or perhaps variety of the true Shawl Goat. The prevailing colour is black, or parti-coloured.

No. 50. *Camelus dromedarius*. The Dromedary or Arabian Camel. "Shootur," of Persians, &c.⁶⁰

59. *Capra ægagrus* is stated by Menetries to be "not uncommon on the Caucasian Alps, seldom if ever descending below an elevation of 1000 feet, and then not in consequence of severe weather." It appears to be generally diffused over the mountains of Persia and Asia Minor, and the adjoining regions of Western Tartary. The London Zoological Society possess a fine specimen of it from the vicinity of Erzeroum. The finest pair of horns of this species which I have seen, is in the British Museum. They measure four feet and a quarter over the curvature, and diverge to sixteen inches apart where widest, not very far from the extremity, the tips returning to fourteen inches of each other: basal circumference nine inches; and depth inside three and three-quarters: they number ten years of growth. It is not usual, however, for this species to exceed three feet and a half in the length of its horns, though these are not unfrequently four inches, or even more, deep at the base.—*Cur. As. Soc.*

60. The two species of Camel are better denominated the one-humped and the two-humped Camels, and the name 'Dromedary' (from *δρομας*) should be restricted to the swift-running breeds which occur of both of them. Hitherto, the Camel and Dromedary have been continually spoken of as distinct animals, sometimes the one, and sometimes the other, bearing either name. Thus Burkhardt refers to the two-humped species by the name dromedary, when he affirms that "the Armenian or Caramanian camel is produced by a he-dromedary and a she Arab camel. The people of Anatolia," he adds, "keep their male dromedaries to breed with the females of the smaller Arab race, which the Turkomans yearly bring to market. If left to breed among themselves, the Caramanian camels produce a puny race, of little value." ('Travels in Nubia,' p. 232.) By the French writers more particularly, the one-humped species (having indeed been termed *C. Dromedarius* by Linnæus,) is commonly styled the Dromedary, as Capt. Hutton also designates it. The mixed race was long ago described by Oleareus, as "a hybrid between the male two-humped and female one-humped camels. They are the most esteemed of all, so much so, that some sell (in Turkey) at 1,000 crowns a piece. They carry 900 or 1,000 weight, and are in a manner indefatigable. They are muzzled. The camels which come of these degenerate very much, and are heavy and slow, being not worth more than 80 or 140 crowns." At Aleppo, the usual price of one of these hybrids is double that of an Arab camel: they are extensively employed in Turkey and Persia; and Sonnini observed a few in Egypt, where they are still rare. These hybrids are, I believe, always of the dark colour of the male, or two-humped parent. The common Indian race, which is diffused hence westward to Senegambia, appears to be constantly of a pale colour in this country; and it is perhaps only the *Dromedary*, or fleet race of it, which is occasionally variable in hue. Thus, in Arabia, we are informed that a lady of Nadja considers it a degradation to mount any other than a black camel, while an Ozanian beauty prefers one that is grey or white. In the continuation of Clapperton's Journey by Lander, we are told of the arrival of 500

The Camel with one hump is in use throughout Afghanistan, but is of a much more robust and compact form than our Indian variety, and well suited to the hilly regions it often has to traverse.

Nothing can be more erroneous, however, than the common belief that the Camel is a hardy animal; so opposed to this is the Afghan opinion, that they used to exclaim with astonishment at the indifference generally shown by us to the comfort of this useful creature. They were often heard to say, "you take immense trouble, and incur great expense in pampering *your men and horses*, but the camel is altogether neglected, although if you wish him to thrive and do his work, you must both feed him well, and clothe and house him too, in winter and in wet weather." In every case where practicable, they acted up to this advice themselves, and no sooner does an Afghan *cafilah* come to its ground after a march, than *the camels are seated round a heap of leaves, straw or grain*. With us, on the contrary, our poor brutes after wandering along from four o'clock in the morning till two or three o'clock in the afternoon, with heavy loads badly fixed upon their backs, no sooner arrived in camp than they were turned out to pick up a morsel around the tents over stoney plains, which produced scarcely any plants of sufficient size to furnish a bite even for sheep, and after a couple of hours passed in an ineffectual search for food, the starving brutes were driven back to camp, and tethered for the night, in most instances without a particle of grain or other food. What wonder then that dozens could not rise beneath a load on the following morning, and were left to be the prey of ravens or the prize of the almost as ravenous Afghan! Let those who prized their cattle, and made some efforts to clothe and feed

camels laden with salt from the borders of the great desert, which "were preceded by a party of Tuarick merchants, whose appearance was grand and imposing. They entered all full trot, riding on handsome camels, some of them red and white, and others black and white." ('Clapperton's' 2nd 'Expedition,' p. 266.) These parti-coloured individuals remind us of the Peruvian Alpaca. In Arabia, and in all northern Africa, much attention is bestowed upon regulating the propagation of the best sort of camels, but especially of the lighter kinds or dromedaries,—termed *Asharry* and *Mahairy*, in Barbary. "Those of Oman," writes the late Lieut. Wellsted, "enjoy a deserved celebrity for strength and swiftness. Nejd is equally the nursery of the camel as of the horse; but the Omary, in all ages, is celebrated in the songs of the Arabs as producing the fleetest; their legs are more slender and straight; their eyes more prominent and sparkling; and their whole appearance denotes them to be of higher lineage than the ordinary breed of the animal." ('Travels in Arabia,' II, 291.) The smallness of the head is a conspicuous and characteristic feature of a true dromedary.—*Cur. As. Soc.*

them on the march, speak as to the benefit they derived from their humanity; camels thus cared for, were brought in safety and in health from India, and again returned to it after marching through the country, and passing through the first campaign.

Numbers of camels that were abandoned on the line of march every morning, from their inability to carry a load, were afterwards hawked about for sale by the country people who had housed, fed, and recovered them. This I know to be a fact, for being in the Shah's commissariat at Candahar, I purchased several of them. That the animal is patient under privations, and will endure to the death, is quite true; but his constitution is tender, and his power of endurance, unless well fed and cared for, is not equal to that of the horse. Rest, food, and warmth, in a word—*comfort*, is more necessary to the camel than to his cruel lord and master.

The Dromedary of Central Asia differs much in its external characters from the animal domesticated in India. In the former we perceive a shortness and a strength of limb, and bulk of carcase, which form a marked contrast to the tall and stately "desert sheep" of India; the one is a short, thick-set, powerfully-made animal, well clothed with a thick close curly hair, to protect it against the cold of winter; the fore-arm often enormously thick and muscular; the hump rounded and compact, and *on a level with which the crown of the head is almost invariably carried.*

The other is a tall, long-limbed, long-necked animal, which placed beside its congener of Korassan, reduces the latter to a mere athletic dwarf;—the thick coat of hair is wanting or considerably reduced, and the head is carried high *above the hump*. Yet notwithstanding the marked dissimilarity in their general configuration, the two animals can only be regarded as varieties of the same species, the differences observable being, I think, solely attributable to climate, domestication, and the different circumstances under which both individuals are placed. I am aware, that in advocating the agency of climate and food, as the great causes which have served to modify the species, I am in a measure reviving an exploded doctrine, yet I am not sure that absolute rejection of the doctrine is altogether warranted or wise; for Cuvier himself declares, "that the wild herbivorous animals feel the influence of climate somewhat more extensively (than the *carnivora*), because there is added to it in their case, the influence of the food, which may happen to differ both

as to quantity and quality. Thus, the Elephants of one forest are often larger than those of another; and their tusks are somewhat longer in places where their food may happen to be more favourable for the production of ivory."⁶¹

Now, precisely the same remarks will apply to the camel, and while, in a country deficient in woody productions, the animal is of small stature, the very reverse is found to be the case in India, where the camel browses entirely on leaves and woody branches favourable to his growth. Every consideration tends to point out to us, that the Indian dromedary is not in its original country, and that adapted as it is by nature for existence in the dry and sandy plains of an arid region like Arabia, its occurrence at all within the influence of the monsoons, is entirely to be attributed to the agency of man, who has brought it with him in a state of domestication from the Postdiluvian focus of diffusion, across mountains and broad rapid rivers, which in its natural state of freedom would have formed insuperable barriers to its further progress eastward, than the long range of mountains extending downwards from the great northern chain through Beloochistan even to the sea, forming a well-worked natural boundary between India and the states of Central Asia. The camel of Korassan is formed for grazing in a country where its food is gathered from the ground, and where it has to perform long journeys through mountain passes and defiles; its shortness and strength of limb are therefore well adapted to its mode of life, and the severity of its climate; while on the other hand, the Indian variety having a range of long and almost interminable level country to travel over, where its chief food consists of the leaves and tender branches of trees, has become modified by domestication to meet the circumstances of its present condition, and thus its limbs are less powerfully built, its body less clothed with hair, and its proportions adapted to reach the food by which the change has been effected, and in which it delights.

Much has been said regarding the existence or non-existence of this animal in a state of freedom, and as yet all tends to prove that neither the camel nor the dromedary have been known wild since the present historical era commenced. It can scarcely be thought possible, that animals of such magnitude as these, can be still living wild in herds upon any country of the known earth, and yet that they should have eluded the researches of naturalists; for although it has been stated by

61. Cuvier's 'Theory of the earth.'

some of the older writers, that in their times the camel was found in the regions of Tartary, yet as their accounts have been corroborated by no later travellers, and as I feel assured, from information carefully collected during a two years' residence at Candahar, from traders to Bokhara and other neighbouring states, that none are found wild in our days, it is most probable that the herds described as once existing in a state of freedom within the modern era, were either as Cuvier has suggested, individuals let loose from religious motives by the Calmucks, or that they were troops of young or even fold animals, turned out to graze together in the breeding districts, as is the custom where pasture is plentiful and the animal not required for immediate labour. This conjecture would more particularly apply to the two-humped or Bactrian camel, which, from its constitution being suited more especially to the cold regions of the northern Steppes, is unable to perform long journeys southward during the heats of summer, and they may therefore be left at that season to roam and feed in herds upon the plains of the Khuzzak country to the north of Bokhara, which appears to be the proper habitat of the species, until the winter setting in again enables them to travel with kafilahs of merchandise, into Russia and other states. It is very certain, however, that if the camel seen by the old authors, or even by Mr. Trebeck, in his tour to Ludak,⁶² was on the Steppes of Tartary, it could have been no other than the Bactrian species, for the Arabian camel would be wholly unable to endure the rigours of the climate in those northern latitudes. Balkh and Bokhara, appearing by all accounts to be the most northern limit in which it can live, and even there it requires the greatest care and the comfort of warm clothing and shelter, to enable it to survive the cold of the winter months. Thus, after all, even if the Bactrian camel could be proved to have been wild within the historical era, we should still require proof that the dromedary had been so found, and as all the arguments hitherto have had reference to this last species, we are still authorised in believing that it at least has never been known to man in a state of natural freedom since the present order of things commenced.

From strict and careful inquiries instituted during a two years' residence in Afghanistan, through traders of all classes who were in the constant habit of travelling into the Tartar countries, as well as through some Khuzzak camel drivers, I am unhesitatingly inclined to adopt the

62. Vide Editor's Note.—Journal As. Soc., No. F.

belief, that neither the one nor the other camel exists wild at present, or has done so since the flood of Noah. The late Sir A. Burnes, with whom I corresponded on such subjects, replied to one of my last letters as follows : "Caubul, 25th May, 1841. I have never seen or heard of the camel being wild, nor do I credit the report if from Moorcroft; but that the animal, at some time or other, must have been, like all other animals, in a state of nature is clear, though certainly not in the historical era: the natives all say the same." This was written in answer to repeated inquiries from me regarding the existence of wild camels in the northern Steppes; and Sir A. Burnes, after a careful examination of all who were likely to throw any light upon the subject, came to the only conclusion that any one can arrive at, namely, that neither species has been known to *Postdiluvian man*, in a state of freedom.

This species (*C. dromedarius*) is not only useful as a beast of burthen to travel with merchandise, but yields a soft and durable wool, which is converted into cloth. In the valley of Pisheen, I have likewise seen them yoked together in the plough, and compelled to till the ground.

No. 51. *Camelus bactrianus*.—Two-humped camel. "Bagdad-i," of Afghans.

This animal is too impatient of heat to undergo even the climate of Candahar for more than a year or two. His true habitat is in the Khuzzak country; he is found in cafilahs which journey to the south, but is not kept in Afghanistan. While this two-humped species cannot undergo the heats of the south, the dromedary on the other hand cannot endure the rigours of the north. To obviate the inconvenience which might arise from this circumstance, the Afghans, or rather the tribes of the northern Steppes, have produced a crossed breed between the two animals, which is enormously powerful and of large stature. Its general appearance varies according as the dam has been a camel or a dromedary, and it is asserted, that if the hybrid animal is *born* in the northern Steppes its constitution unfits it for a continued residence in a hot country, while on the other hand, if born in a warm climate, it cannot endure a great degree of cold. This circumstance is worth attending to, since I heard of several persons, who were anxious to introduce the hybrid into India, in order to strengthen our dromedaries. The cross however, should be obtained from the camel and female dromedary, and the produce be born in our own provinces, if the assertion of the Afghans is to be relied on. I do not think, however, that any good

would result from crossing our breed, which is admirably adapted to the Indian climate and the work it has to perform, and we may perhaps in this case, follow with advantage, the old adage of "Let well alone."

The species said to exist among the Kirguise, and supposed to be distinct from the two forementioned species, is, in all probability, nothing more than the hybrid obtained from the camel and dromedary. I heard of no instance of the hybrids breeding *inter se*, but at the same time I do not consider the point decided, or even of consequence, either one way or the other; as the fact of hybrids breeding *inter se* cannot prove identity of species in the original parent stock, since I have more than once obtained and reared offspring from hybrid birds, which offspring moreover again bred *inter se*. Yet, notwithstanding this, the original species were distinct, being the one a female canary, and the other a common linnet. Such being the case, it must be evident that if the offspring of the domestic goat and the wild *ægagrus* were proved capable of breeding *inter se*, it would not show that the wild and domestic breeds were identical!

In respect to the stock from which the camels originally descended, I hold the same opinions as those set forth in regard to the domestic sheep and goats, namely, that they never had, during the historical era, any wild representatives, the whole having been retained by man after the exit from the Ark. The camels, therefore, like most others of our domestic cattle, I hold to be species whose original stock perished in the waters of the Noarchian deluge. These opinions will elsewhere lead me to remark upon the habitats of the modern camels, with a view to ascertain whether both could have spread from the focus of Postdiluvian diffusion, or whether the country of Armenia be in reality the true resting place of the Ark, a point on which I am inclined to be sceptical.

No. 52. *Sciurus palmarum*.—The Palm Squirrel.

This little animal is found in the Bhawulpore country, and extends into the jungles of Cutchee as far as the borders of the "Putt," or desert between Poojaun and Burshore. It does not appear to cross that desert, and is not found in Afghanistan.

P. S.—I think I may venture to say, that very few wild mammalia occur below Ghuznee, which have not been here noticed, and those will probably be small species.

In the northerly mountains of Cabul, &c. doubtless many are found, but as my personal observations were confined to the neighbourhood of

Candahar and the route to that city, I shall not venture further on the subject. I do not think, however, that any large ruminants will be found even there.

I will send you a notice of the birds collected also.

These notes are not arranged in order, but that you can easily rectify. I have been obliged to write them for you as I could lay my hands on my old memoranda, which have become confused. You are at liberty to describe, and name any species that may appear new.

THOMAS HUTTON.

Additions and corrections to former Notes, Vol. XIV, p. 340 et seq.

NOTE 2, p. 341.—With reference to the range of the Tiger on the Himalaya, I should have quoted the Rev. R. Everest's paper 'On the power of enduring cold in the mammalia of hot countries,' published in *An. and Mag. Nat. Hist.*, VIII, 325. "The Tiger," remarks that gentleman, "is very scarce in the Himalaya, even in summer time, being too large and unwieldy an animal to follow the caprine races over the precipitous ground. I, however, met with their tracks on the snow near my house; and while shooting in the oak-forest, from 5,000 to 6,000 feet above the sea, had one of my people carried away by one. They can go wherever the [Jerrow (*Cervus Aris-totelis*,)] can obtain a footing, and remain on a mountain north of Mussoorie, (Nagtiba, near 10,000 feet in height,) all the year round. They live principally on stags and also bears."

NOTE 6, p. 342.—Prof. Behn, of Kiel University, and now with the Danish expedition on board the Galathea, pronounces this to be distinct from the European *Felis sylvestris*. The state of the skin does not permit of a satisfactory description being taken from it; but it may be briefly characterized as of a light fulvous colour, mottled or varied with blackish on the back, which colour forms somewhat large, transverse, ill-defined stripes on the sides and limbs, and more distant spots on the under-parts: the tail tapering, with five or six rings of black, and a black tip; and the fur moderately long and dense. Length about two feet, the tail a foot more. If new, *F. Huttoni*, nobis.

NOTE 8, p. 343.—"The Afghan pointer," remarks the late Major Brown, "has been long known, having occasionally been brought down for sale by the fruit-merchants; but they have never been considered equal to the English dog. In Afghanistan they are called *Boders*, and are used for shooting pretty generally throughout that country, including Cashmere. They have rather a coarse heavy appearance, and the one now described resembles a Beagle a good deal; otherwise it has much the appearance of an India-bred English pointer. The hair is smooth, of a red and white colour: it stands short on the legs, with a large double dew-claw on each hind-leg, which has a very ugly appearance. Its ears are well hung but short; the breadth at the forehead is great, but the muzzle small, and it has great natural courage. Apparently it has never been broken in, and some large scars about the head testify that it has fought some hard battles in its day." 'Gunga,' in *Bengal Sporting Magazine*.

NOTE 15, p. 346. *Mangusta pallipes*. Since the note referred to was written, the Society has received specimens of *M. Edwardsii* (apud Ogilby) from Agra, which render it extremely doubtful whether the Afghan species can be considered more than a variety of the same: upon comparison of the skulls, however, the first false molar of both jaws is much smaller in Afghan than in Bengal specimens. The last appear

always to be of a much darker and browner colour, resembling those from Nepal—*M. auropunctata* of Hodgson, which name will, I believe, stand.

NOTES 19 and 20, p. 352 *et seq.* Hedgehogs. The Indian species of this genus are still much in need of investigation. Four have received names, as follow:—

1. *E. collaris*, Gray: founded upon Gen. Hardwicke's figure of a specimen obtained in the 'Dooab.' This is represented to have uniformly blackish spines, rather large ears, which are greatly emarginated posteriorly, a blackish face, more rufous chest, and a narrow band of pure white on the throat, commencing from the ear. In Mr. Gray's recent catalogue of the mammalia in the British Museum, three specimens referred to this animal are enumerated, one of them from Madras, presented by Walter Elliot, Esq.

2. *E. spatangus*, Bennet, *Proc. Zool. Soc.* 1832, p. 123.

3. *E. Grayi*, Bennet, *ibid.* p. 124. Both from the Himalaya, and referred "to that extra European form of the genus *Erinaceus*, which is distinguished by the possession of large ears."

4. *E. mentalis*, Gray; "Black-chinned Hedgehog," from the Himalaya.—Seemingly undescribed, being merely enumerated with the preceding three in Mr. Gray's catalogue of the British Museum mammalia.

Capt. Hutton's No. 19, from Afghanistan, to which I gave the provisional name *megalotis*, would seem to approximate the *E. spatangus*; but the difference of size is too great to admit of the probability of their being young and adult of the same, the advanced dentition of Mr. Bennet's specimen leading him to suppose it "probably not fully adult, there being only two false molars on each side of the upper jaw." The head and body of *E. spatangus* are given as but three inches and a quarter, tail a quarter of an inch, ears three inches and a quarter, and tarse to end of claws an inch. Capt. Hutton's recent Afghan specimen is described as about a foot in length, minus the tail, the latter measuring an inch and a half. (?) The example of it sent, is about the size of a moderately large European Hedgehog, with great ovate ears, an inch and a quarter long, and seven-eighths in extreme breadth: tarse to end of claws an inch and a half, tail but five-eighths; entire length of skull, with projecting upper incisors, two inches and a quarter.

Of Capt. Hutton's No. 18, the first and second specimens mentioned by him are, I suspect, rightly referred to *E. collaris*: but his third specimen seems, from the description, identical with one in the Society's museum, the locality of which is unknown, and also with others from S. India, obligingly sent me on loan by Mr. Elliot, and to which I suspect that Mr. Gray's 'Madras' specimen (presented by Mr. Elliot,) and probably the two others referred by him to *E. collaris*, likewise appertain. The crania and dentition of an adult sent by Mr. Elliot, and that of the Society's specimen, correspond exactly: but Capt. Hutton's skull of the Bhawalpore Hedgehog presents some differences; the general form is rather shorter and broader, it is more constricted between the orbits, and the zygomæ are considerably more projecting; the small upper pre-molar anterior to the scissor-tooth is less minute; and in the lower jaw, the second lateral pair of incisors from the front are much smaller, as indeed are also the next or last pair of the true incisors. If new, I propose to call this species *E. micropus*.

Another Asiatic hedgehog, additional also to *E. auritus* of Siberia, and nearly allied to the European species, is *E. concolor*, Martin. *P. Z. S.* 1837, p. 103, described from a specimen received from Trebizond.—*Cur. As. Soc.*

JOURNAL
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ASIATIC SOCIETY.

CATALOGUE OF MAMMALIA.

Inhabiting the MALAYAN PENINSULA AND ISLANDS.

*Collected or observed by THEODORE CANTOR, M. D., Bengal
Medical Service.*

☞ Localities printed in Italics signify those from whence the animals of the Catalogue were obtained; in ordinary type those previously given by authors.

QUADRUMANA.

SIMIADÆ.

GEN.—PITHECUS, *Geoffroy.*

PITHECUS SATYRUS, *Geoffroy.*

SYN.—*Simia Satyrus*, Linné.

Simia Agrias, Schreber.

Singe de Wurmb, Audebert.

Papio Wurmbii, Latreille.

Pithecus Satyrus, Desmarest.

Simia Wurmbii, Kuhl.

Orang Pandak, Raffles.

Simia Satyrus,
Simia Abeli,
Simia Wurmbii, } apud Fisher.

Simia Satyrus, apud Ogilby.

Satyrus rufus, Lesson.

Pithecus Satyrus, apud Martin.

Simia Satyrus, apud Schinz.

“O’rang U’tan” of the Malays.

HAB.—*Borneo, Sumatra.*

The physiognomy and the colour of the face exhibit a marked difference in living individuals from the two localities.*

GEN.—HYLOBATES, *Illiger.*

HYLOBATES LAR, Ogilby.

SYN.—Grand Gibbon, Buffon.

Homo Lar, Linné, Mantiss.

Simia longimana, Schreber.

Simia longimana, Grand, et Petit Gibbon, Erxleb.

Simia Lar, Linné Syst.

Le Gibbon, Audebert.

Pithecus Lar, Desmarest.

Simia albimana, Vigors and Horsfield.

Simia Lar, apud Fischer.

Hylobates Lar, Lesson, apud Martin.

Hylobates albimanus, apud Schinz.

“Ungka étam” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Siam, Burmah, Tenasserim.

LIGHT-COLOURED VAR.

SYN.—Petit Gibbon, Buffon.

Simia Lar, β . Linné.

Pithecus variegatus, Geoff.

Pithecus variegatus, apud Kuhl.

Pithecus variegatus, apud Desmarest.

Hylobates variegatus, Ogilby.

Hylobates leuciscus, apud Cantor. Ann. and Mag. of Nat. Hist.

“Ungka puti” and “Wow-wow” of the Malays of the Peninsula.

* An excellent likeness of a young male Bornean Orang Utan, living in my possession upwards of two years, has lately been taken by Mr. Thornam, one of the artists of the scientific expedition on His Danish Majesty’s Ship ‘Galathea.’

The colour varies from blackish-brown to light-brown, yellowish or dirty-white, sometimes uniform, sometimes mottled. The index and middle toes, of both or of one foot, are in some individuals, of whatever sex or shade of colour, united by a broad web throughout the whole of the first phalanx; in some partially so, and in others not. The ribs vary from twelve (7+5) to thirteen pairs (7+6,) as observed by Mr. Blyth, (Journal Asiatic Society 1841, Vol. X. p. 839.)

HYLOBATES AGILIS, F. Cuvier.

VAR. UNGKA ETAM, Martin.

SYN.—Ungka etam, Raffles.

Oungka, Hylobates Lar, F. Cuv.

Simia Lar, Vigors and Horsfield.

Hylobates Rafflesii, Geoff. apud Ogilby.

Hylobates variegatus, Müller apud Schinz*.

“Ungka etam” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula, (Malacca, Purlis, Kéddah, Púngah.)*
Sumatra.

The first phalanges of the index and middle toe are in some individuals of either sex, partially or entirely united by a web. Sometimes the first phalanx of the middle toe is partially united to the fourth.

An adult male examined, had thirteen pair of ribs (6+7), an adult female fourteen, (7+7), a young male on the left side thirteen (7+6), on the right twelve (7+5). In these three individuals the stomach was constricted at the fundus and the pyloric part, which characters, when compared with specimens of *Hylobates agilis* from Sumatra, will go far to decide the identity of that species and *H. Rafflesii*. On the Malayan Peninsula, the latter appears to be less numerous than *H. Lar*. The light-coloured Var. of *H. agilis* I have not seen.

HYLOBATES LEUCISCUS, Kuhl.

SYN.—“Wou-wou,” Camper.

Simia leucisca, Schreber.

Simia moloch, Audebert.

Pithecus cinereus, Latreille.

Pithecus leuciscus, Geoffroy.

Pithecus leuciscus, apud Desmarest.

* Schinz gives as a synonyme: *Pithecus variegatus*, Geoff. which, however, is *Hylobates Lar*, Var.

Simia leucisca, apud Fisher.

Hylobates leuciscus, apud Ogilby.

Hylobates leuciscus, apud Schinz.*

HAB.—*Borneo*, ?

Java.

GEN.—SEMNOPIITHECUS, *F. Cuv.*

SEMNOPIITHECUS OBSCURUS, Reid.

SYN.—*Simia maura* ? Lin. Lotong, apud Raffles.†

Semnopithecus leucomystax, Temm. in MSS.

Semnopithecus obscurus, apud Martin.

Presbytes obscura, Gray, List of Mamm. B. M.

Semnopithecus sumatranus, Müller, apud Schinz.‡

Semnopithecus halonifer, Cantor, Proceed. Linn. Soc.

“Lótong” or “Lótong étam,” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*, *Pinang*, *Singapore*.

District adjacent to Singapore, in the Malayan Peninsula.

SEMNOPIITHECUS ALBOCINEREUS, Schinz.

SYN.—*Cercopithecus albocinereus*, Desmarest.

Simia albocinerea, Fisher.

Semnopithecus dorsatus, (young) Waterhouse MSS.§ apud

Presbytes cinerea, Gray, List.

[Martin.

Semnopithecus albimanus, Is. Geoff. ?

“Ka-ka” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

* Among the Syn. occurs *Ungka puti*, Raffles, which is *Hylobates agilis*.

† The Hab. Pinang and Singapore, in neither of which islands *Semnopithecus femoralis* appears to occur, tends to prove, that Sir S. Raffles did not, as it has been supposed, refer to that species. His short description indicates *S. obscurus* (Lotong,) the most common species in both islands. Sir S. Raffles evidently did not describe the living animal, or he would not have omitted one of the most striking characters, viz. the white marks of the face, which, in preserved specimens, become obliterated, so that the face appears uniformly black. The omission of this character by Sir S. Raffles, and subsequently by later describers of this species, has given rise to confusion.

‡ Schinz repeats *S. femoralis*, Martin, as a Syn. for *S. sumatranus*, and says in a note, that Müller in his monograph of *Semnopithecus* refers that species to his *S. sumatranus* (Schinz Syn. Mam. I. p. 39, note.) Were even the two identical, the species should not have been renamed, as *S. femoralis*, *Horsfield*, not Martin, would take precedence, being the denomination under which Dr. Horsfield described it in the *Appendix to the Life of Sir T. Stamford Raffles*, 1830.

§ Martin, p. 481, refers the young *S. dorsatus* to *S. femoralis*, but the description is that of the young of the present species.

The young of this species, described by Martin, p. 481, is from the peculiar distribution of the colours, as easily distinguished from the young of *S. obscurus*, as it is difficult to distinguish the adults of these two species. Both attain to the same size, have in common the shape of the body, the white marks of the face, and the general distribution of colours. In the adult of the present species the prevailing colours are clear ashy-grey above, and white below. On either parietal bone, the hairs form a whorl, and the anterior are directed forward, projecting beyond the eyebrows. The two whorls are distinct in the young, though the hairs of the head are too short to mingle with the long, erect, divergent, black hairs of the eyebrows. Just below the spot where the two whorls come in contact, the skull is naked, thus forming a rather broad, triangular forehead. The general colour of *S. obscurus*, both in the young and adult state, is considerably darker. On the upper parts a blackish, or brownish ash colour prevails, lighter below, which acquires in some individuals a whitish appearance, from the white skin of the stomach, which is but scantily covered with hairs. Of parietal whorls there is no trace; the hairs of the head, directed backwards, originate in a peak as far down as the glabella, and are smoothed down on the top of the head from the occipital crest backward.

SEMNOPIITHECUS CRISTATUS, Horsfield.

SYN.—*Simia cristata*, Chingkau, Raffles.

Semnopithecus pruinosus, Desmarest.

Semnopithecus pruinosus, apud Lesson.

Semnopithecus cristatus, apud Martin.

Presbytes cristata, Gray:* List.

Semnopithecus cristatus, apud Schinz.*

HAB.—*Pinang, Malayan Peninsula.*

Sumatra, Borneo, Banka.

The whitish colour round the eyes and the mouth is present, though less distinct in this than in the preceding two species.

SEMNOPIITHECUS FEMORALIS, Horsfield.

SYN.—*Semnopithecus chrysomelas*, Muller, apud Martin and Schinz.

* Gray quotes *S. maurus*, Horsfield, and Schinz *S. femoralis*, Martin, as synonyms, both of which are species, in physiognomy, colours, and, as far as *S. maurus* is concerned, in habits distinctly different from the present one.

HAB.—*Purlis* (on the Malayan Peninsula.)

Borneo, Java (?), Sumatra (?).

In a young male of this, apparently everywhere difficultly procurable species, the face during life was intense black, except the white-haired lips and the chin, which were of a milk-white colour. In the preserved specimen, the latter soon changed into the dull brownish-black of the rest of the face. The interdigital membrane, often loosely connecting the first phalanges of the four fingers and toes in *S. obscurus*, *albocinereus*, *cristatus* and other Malayan monkeys, was also present in this individual, in which even the first and second phalanges of the index and middle toe were thus connected. In preserved specimens, the interdigital web becomes shrivelled and indistinct, and therefore, being at all times a very questionable, if not altogether inadmissible, specific character, ought in such state to be least relied upon. On its arrival at Pinang, the animal was in too sickly a state to allow of its natural habits being observed.

GEN.—CERCOPITHECUS, apud *Ogilby*.

CERCOPITHECUS CYNOMOLGUS, *Ogilby*.

SYN.—*Simia cynomolgus*, Linné.

Simia aygula, Linné.

Simia attys, Schreber.

Macacus cynomolgus, Desmarest.

Simia fascicularis, Raffles.

Cercocebus aygula, Geoff. apud Horsfield.

Macacus cynomolgus, apud Gray : List.

Macacus cynomolgus, apud Schinz.

“Kra” of the Malays of the Peninsula.

HAB.—*Pinang*, Malayan Peninsula.

Sumatra, Java, Banka, Borneo, Celebes, Timor, Tenasserim, Nicobar Islands.

The first phalanges of the four fingers and toes, and in some individuals also the second phalanges of the toes, are united by a membrane.

GEN.—PAPIO, apud *Ogilby*.

PAPIO NEMESTRINUS, *Ogilby*.

SYN.—*Simia nemestrinus*, Linné.

Simia platypygos, Schreber.

Simia fusca, Shaw.

Macacus nemestrinus, Desmarest.

Simia carpolegus, Raffles.

Macacus nemestrinus, apud Gray, List.

Macacus nemestrinus, apud Schinz.

“Broh” of the Malays of the Peninsula.

HAB.—*Pinang, Malayan Peninsula.*

Sumatra, Borneo.

The interdigital membrane of the first phalanges of the four fingers and index, and middle toe, occurs also in this species.

LEMURIDÆ.

GEN.—*NYCTICEBUS, Geoffroy.*

NYCTICEBUS TARDIGRADUS, Waterhouse, Cat. Zool. Soc.

SYN.—*Lemur tardigradus*, Linné apud Raffles.

Nycticebus bengalensis, Geoff.

Nycticebus javanicus, Geoff.

Loris tardigradus, Geoff.

Stenops javanicus, Van der Hoeven.

Stenops tardigradus, Wagner, apud Schinz.

“Kúkang” of the Malays of the Peninsula.

HAB.—*Pinang, Malayan Peninsula.*

Java, Siam, Tenasserim, Arracan, Bengal, Sylhet, Assam.

The sublingual appendage is cartilaginous, of a white colour; the apex divided in a number of fine points. The new-born is of the same colour as the adult, but paler, and has the dense, soft fur, mixed with a number of long hairs, grey at the base, white at the point. In a male, measuring from the apex of the nose to the root of the tail one foot two and a half inches, the tail five-eighths of an inch, the dimensions of the intestinal canal, were:

Small Intestines,	3 feet $\frac{1}{2}$ inches.
Large ditto,	2 ,, $3\frac{1}{2}$,,
Cæcum,	0 ,, $3\frac{1}{2}$,,

GEN.—*GALEOPITHECUS, Pallas.*

GALEOPITHECUS TEMMINCKII, Waterhouse.

SYN.—*Lemur volans*, Linn. apud Marsden and Raffles.

“Kúbong” or “Kúrbong” of the Malays of the Peninsula.

HAB.—*Singapore, Pinang, and other Islands in the Straits of Malacca, Lancavy Islands, Malayan Peninsula.*

Java, Sumatra, Borneo, Pelew Islands, Siam.

Two individuals are never of precisely the same design and ground-colour, which latter varies from clear ashy-grey to greyish-brown or chesnut. The white spots on the back of the anterior extremities, appear to be constant in every age. Though there are four mammæ, situated in pairs one above the other, close to the axilla, of a number of females with young, none had more than one offspring, which was carried wrapped in the wide mantle-like membrane. In several shot on the hills at Pinang, the stomach contained vegetable matter, but no remains of insects. In confinement, plantains constitute the favourite food, but deprived of liberty the animal soon pines and dies. The anterior margin of the broad smooth tongue has a fringed appearance, produced by a number of rounded papillæ. In a male, measuring from the apex of the nose to the root of the tail one foot four inches, the tail nine inches, the intestinal canal was of the following dimensions :

Small Intestines,	4 feet 4 inches.
Large ditto,	7 ,, 7 ,,
Cæcum,	0 ,, 11 ,,
Costæ veræ seven pairs, spurix six pairs.	

CARNIVORA.

CHEIROPTERA.

INSECTIVORA.

GEN.—RHINOPOMA, *Geoffroy.*

RHINOPOMA, *HARDWICKII*, Gray.

SYN.—*Vespertilio (Rhinopoma) Hardwickii*, Elliot.

HAB.—*Malayan Peninsula.*

Southern Mahratta country, Calcutta, Allahabad,* Agra,†
Mirzapore.

A single male, in no way differing from Bengal individuals, was obtained by Captain Congalton, H. C. Steamer 'Diana,' in a cave on an island in Girbee river, in Latitude 8° 0', on the Malayan Peninsula.

This species is provided with a true cæcum, the existence of which in all Cheiroptera has erroneously been denied, or restricted to the car-

* Numbers inhabit the subterraneous Hindoo place of worship within the Fort at Allahabad.

† In the Taj-Mahal.

diac cæcum observed in the genera *Vampyrus* and *Pteropus*. The present species, and *Megaderma spasma*, also possessing a true cæcum, thus present a higher organisation than has hitherto been attributed to Cheiroptera.

Length of the small Intestine,	$7\frac{2}{8}$ inches.
,, ,, large ditto,	1 ,,
,, ,, cæcum,	$0\frac{3}{16}$,,

GEN.—MEGADERMA, *Geoffroy*.

MEGADERMA SPASMA, *Geoffroy*.

SYN.—*Vespertilio spasma*, Schreber.

Megaderma trifolium, *Geoffroy*.

Megaderma spasma, apud *Fisher*.

Megaderma spasma, apud *Schinz*.

HAB.—*Pinang, Malayan Peninsula*.

Singapore, Java, Ternate.

Incis. $\frac{0}{4}$ Canin. $\frac{1-1}{1-1}$ Molar, $\frac{4.4}{5.5}$

Length of the head and body $3\frac{2}{8}$ inches.

,, ,, ,, inter-femoral membrane, 1 inch.

Extent of the flying membrane, .. 14 inches.

The five caudal vertebræ project one quarter of an inch beyond the pelvis, but are completely enveloped in the inter-femoral membrane, and therefore not apparent. The inguinal warts are, as in the *Rhinolophi*, most developed in the adult female. A true cæcum, though smaller than in *Rhinopoma Hardwickii*, is present in this species.

Length of the small Intestines, 7 inches.

,, ,, large ditto, $1\frac{1}{16}$ inches.

,, ,, cæcum, $0\frac{1}{16}$ inches.

GEN.—NYCTINOMUS, *Geoffroy*.

NYCTINOMUS TENUIS, *Horsfield*.

SYN.—*Nyctinomus tenuis*, apud *Fisher*.

Molosse grêle, *Temminck*.

Dysopes tenuis, *Schinz*.

HAB.—*Malayan Peninsula*.

Java, Sumatra, Borneo.

Two individuals had the back of a velvety snuff colour, becoming a shade lighter on the under-parts. Entire length of the larger four and four-eighth inches, of which the tail one and two-fourth inches. Extent of the flying membrane ten and four-eighth inches. In the size of the ears some difference exists in the two.

GEN.—TAPHOZOUS, *Geoffroy*.

TAPHOZOUS MELANOPOGON, Temminck.

SYN.—Taphozous melanopogon, apud Schinz.

HAB.—*Pulo-Tikus, Pulo-Lancávy, Malayan Peninsula.*

Java, Caves of Kannerá.

Temminck's description, as quoted by Schinz, is taken from the adult male, the Malayan individuals of which differ in having the black beard surrounded by a broad light-brown band, covering, like a pelerine, the chest and shoulders. The rest of the lower parts are either white or brownish-white. The flying membrane in the adult male is whitish; in the females and young males it is blackish or brownish between the legs, along the sides of the body and the arms. The colour of the female and young male is on the back of a more or less brownish mouse-grey, becoming much lighter or whitish beneath, but both are destitute of the black beard, which, out of a number of between forty and fifty from different Malayan localities, occurred but in seven males, although some of the beardless males in size and extent of flying membrane equalled, or even slightly exceeded, the bearded. The entire length of the largest male was four inches, of which the tail measured one inch.

Extent of flying membrane fifteen and four-eighth inches.

Dentition: Incis. $\frac{0}{4}$ Canin. $\frac{1-1}{1-1}$ Molar, $\frac{4.4}{5.5}$

TAPHOZOUS SACCOLAIMUS, Temminck.

SYN.—Taphozous pulcher, Elliot MSS. apud Blyth.

HAB.—*Pinang.*

Java, Sumatra, Borneo, Celebes, Southern India.

In two males captured at Pinang in houses in the valley, the colours somewhat differ from Temminck's description, quoted by Schinz. In the larger, the head and back are of a sooty black, with a few white dashes, the lower parts of a pure white. The flying membrane is black

between the legs, along the sides of the body and the arms, and between the index, second and third fingers; the rest being dull semi-transparent white. The length from the apex of the nose to the posterior margin of the inter-femoral margin, is four and seven-eighth inches, of which the tail measures one inch. The extent of the flying membrane eighteen inches. Dentition as in *T. melanopogon*. The smaller differs in having the chest of a pale brownish-white, the abdomen and the pubes light rust-coloured, leaving the sides pure white. Mr. Blyth quotes *Taphozous pulcher*, Elliot, from Southern India, as being "black-brown above with white pencillings, and pure white below," (Journal As. Soc. XIII. 1844. p. 492,) from which, as well as from Mr. Elliot's specimen, at present in the Museum of the Asiatic Society, it appears that the Indian more resemble the Malayan individuals than those of the Indian Archipelago, described by Temminck. The internal surface of the gular sac secretes, an odorous oily fluid, of a light brown colour.

GEN.—RHINOLOPHUS, *Geoffroy*.

RHINOLOPHUS, *Gray*.

RHINOLOPHUS AFFINIS, *Horsfield*.

HAB.—*Pinang*.

Java.

Of two individuals, the male is reddish-brown above, light greyish-brown beneath; the female is above golden fulvous, which becomes lighter on the lower parts.

Entire length of the male, .. $2\frac{4}{8}$ inches—female, $2\frac{7}{8}$ inches.

Tail, $\frac{4}{8}$,, female, $\frac{5}{8}$,,

Extent of flying membrane, .. $11\frac{2}{8}$,, female, $12\frac{4}{8}$,,

Incis. $\frac{2}{4}$ Canin. $\frac{1-2}{1-1}$ Molar, $\frac{5.5}{5.5}$

The inguinal warts are highly developed in the female.

HIPPOSIDEROS, *Gray*.

A. Adult male with a frontal pore, with a tuft of rigid hairs.

HIPPOSIDEROS DIADEMA, *Gray* ?

SYN.—*Rhinolophus Diadema*, *Geoffroy* ?

HAB.—*Pinang*, *Malayan Peninsula*.

Timor.

The Malayan individuals are, according to age and sex, of a more or less intense reddish or greyish-brown above, under certain lights assum-

ing a golden lustre, owing to the whitish points of the hairs; beneath, they are of a lighter greyish-brown. Individuals occur of a light golden-brown, in colours resembling *Rhinolophus larvatus*, Horsfield. In the adult male, the livid flesh-coloured nasal appendage is larger, more complicated, and somewhat different from the figure given by Geoffroy St. Hilaire, (Ann. du Muséum XX, Pl. 5 and 6), which resembles the female in the simpler appendage and in the absence of the frontal pore. The latter organ, in the adult male, is large, secreting a yellowish brown oily fluid, the odour of which resembles that of *Arctictis Binturong*, Fisher. A female, during lactation, presented a great inequality in the development of the inguinal warts, of which the right measured one-quarter of an inch in length. At the time of her capture, it was reported that a young one had been "sucking" the right wart. Not having myself observed the young clinging to that organ, I cannot vouch for the correctness of a statement which, if authentic, would tend to explain the use, being to afford support to the young, when not sucking. The size of the Malayan individuals appears to exceed those from Timor, the entire length of the former being five and six-eighth inches, of which the tail measures two inches. Extent of the flying membrane twenty-one and a half to twenty-two inches. The extremity of the 2nd phalanx of the fourth and fifth fingers is bifid, or terminating with two minute diverging joints, a structure also existing in the Malayan individuals of the following species.

Incis. $\frac{2}{4}$ Canin. $\frac{1-1}{1-1}$ Molar, $\frac{5.5}{5.5}$

HIPPOSIDEROS NOBILIS, Gray.

SYN.—*Rhinolophus nobilis*, Horsfield.

Rhinolophus nobilis, apud Fisher.

Rhinolophe fameux, Temminck.

Rhinolophus nobilis, apud Schinz.

HAB.—*Pinang, Malayan Peninsula.*

Java, Sumatra, Timor, Amboyna.

The frontal pore is less developed than in the former species, as compared with which the present is of a more slender form, though of a size little less inferior. Entire length five and four-eighth inches, of which the tail measures two and one-eighth inches. Extent of flying membrane twenty-one and four eighth inches. Dentition similar to that

of *H. Diadema*. In the valley of Pinang single individuals of both species are at night abroad at all seasons, but during the rains they are particularly numerous.

HIPPOSIDEROS VULGARIS, Gray.

SYN.—*Rhinolophus vulgaris*, Horsfield.

Rhinolophus insignis, Var. apud Temminck.

Rhinolophus insignis, Horsf. apud Schinz.

Rhinolophus vulgaris, Horsf. *female of insignis*, apud Schinz.*

HAB.—*Pinang*.

Java.

Entire length four inches, of which the tail measures one and three-eighth; extent of flying membrane fourteen inches.

Incis. $\frac{2}{4}$ Canin. $\frac{1-1}{1-1}$ Molar, $\frac{4.4}{5.5}$

HIPPOSIDEROS MURINUS, Gray.

SYN.—*Rhinolophus murinus*, Elliot.

HAB.—*Pinang*.

Southern Mahratta Country, Nicobar Islands.

Entire length two and four-eighth inches, of which the tail measures one inch. Extent of flying membrane nine and four-eighth inches.

Dentition similar to that of the last species.

B. Forehead simple.

HIPPOSIDEROS GALERITUS, N. S.

H. prosthematicis simplicis membranâ transversâ latâ, altè erectâ, auricularum, latè pyriformium, apicibus laciniâ exsertis, besse postico lobuloque basali villosis; vellere longo, denso, molli, bicolore; suprâ saturatè, subtus pallidius-fusco-rufescenti.

Latet fœmina.

HAB.—*Pinang*.

Entire length three inches, of which the tail measures one inch. Extent of the flying membrane ten and four-eighth inches.

Incis. $\frac{2}{4}$ Canin. $\frac{1-1}{1-1}$ Mol. $\frac{4.4}{5.5}$

The livid flesh-coloured nasal appendage is simple but large, occupying the whole upper part of the face and the forehead; the horse-shoe or

* The only individual of *Rhinolophus vulgaris*, Horsfield, observed at Pinang, happened to be a *male*.

nasal disk covers the short, rounded, hairy muzzle, which has two leaves on either side; the transversal membrane is concave, as broad and long as the horizontal horse-shoe, which it joins under a right angle, while its sides are almost in contact with the ears. The latter are sub-erect, broader than long, their breadth equalling the length of the head; the shape is broad, pyriform, narrowing towards the apex, which appears like a small artificially rounded flap, scarcely elevated above the level of the fur covering the vertex. More than two-thirds of the back of the ear is covered with fur, leaving a narrow naked line along the external margin, which, as well as the singular shape of the ear itself, affords a distinguishing character. The hairs are buff or whitish at the base, the other half of their length brown. The general colour of the upper parts is deep-brown, with a slight reddish hue, becoming a shade lighter beneath.

This species somewhat resembles *Hipposideros apiculatus*, Gray (*Vespertilio speoris*, Schneider, apud Schreber; *Rhinolophus speoris*, Geoffroy,) from which it however differs in the absence of the frontal pore, in the shape of the ears, and in colours. A solitary male was captured in the valley of Pinang.

GEN.—*VESPERTILIO*, Linné.

VESPERTILIO, Gray.

VESPERTILIO ADVERSUS, Horsfield ?

SYN.—*Vespertilio adversus*, Fisher ?

Vespertilio adversus, Temminck ?

Vespertilio cineraceus, Blyth MSS.

HAB.—*Pinang*.

Java, Calcutta.

This bat having the characteristic distinction of the upper incisor, described by Horsfield, is above greyish-brown, beneath light-greyish, measuring in length three and two-eighth inches, of which the tail is one and four-eighth inch. Extent of flying membrane ten and four-eighth inches. It differs from *V. adversus* in having on each side five molars, of which but two are spurious, which character also obtains in *V. cineraceus*, Blyth MSS. and specimen in the Museum Asiatic Society, which (as observed by Mr. Blyth,) as well as the present, may prove varieties of *V. adversus*, Horsfield.

KIRIVOULA, Gray.

KIRIVOULA PICTA, Gray.

SYN.—*Vespertilio ternatanus*, Seba?

Vespertilio pictus, Pallas, apud Horsfield.

Vespertilio kerivoula, Boddaert.

Vespertilio kerivoula, apud Geoffroy.

HAB.—*Pinang*.

Java, Sumatra, Borneo, Ceylon.

KIRIVOULA TENUIS, Gray.

SYN.—*Vespertilio tenuis*, Temminck, apud Schinz.

HAB.—*Pinang*.

Java, Sumatra, Borneo.

A single male, in colours slightly differing from Temminck's, being above of a dark greyish-brown, many of the hairs with white points; beneath of a lighter shade. Entire length three and two-fourth inches, of which the tail one and four-eighth inch. Extent of flying membrane ten inches.

Incis. $\frac{2-2}{6}$ Canin. $\frac{1-1}{1-1}$ Mol. $\frac{5.5}{5.5}$

Trilatitus, Gray.

TRILATITUS HORSFIELDII, Gray.

SYN.—*Vespertilio tralatitius*, Horsfield.

Vespertilio Gärtneri, Kuhl, apud Schinz.

HAB.—*Pinang*.

Java, Sumatra.

Scotophilus, Leach, apud Gray.

SCOTOPHILUS TEMMINCKII, Gray.

SYN.—*Vespertilio Temminckii*, Horsfield.

Vespertilio Belangerii, Isid. Geoff.

Vespertilio noctulinus, Isid. Geoff.

Scotophilus castaneus, Gray.

Nycticeius Temminckii, Schinz.

Nycticeius Belangerii, Temminck, apud Schinz.

Nycticeius noctulinus, Temminck, apud Schinz.

“Klâwah” of the Malays of the Peninsula.

HAB.—*Singapore, Pinang, Malayan Peninsula and Islands.*

Java, Sumatra, Borneo, Timor, Pondicherry, Calcutta.

As observed by Schinz, this species is very variable in its colours according to age, all of which variations occur in individuals inhabiting Pinang and the Malayan Peninsula. The following are the specific names attributed to different individuals of this species:—

1. *Vespertilio Temminckii*, as originally described and figured in *Zoological Researches in Java*. Back dark-brown; greyish-brown underneath. Entire length four inches six lin., of which the tail one five-eighth of an inch; Extent of flying membrane twelve inches.

2. *Scotophilus castaneus*, Gray.

3. *Nycticeius Belangeri*, Temminck, apud Schinz. Hairs of the back brown at the base, chesnut or olive-chesnut at the apex; beneath light yellowish-brown, isabella or whitish. Entire length $3\frac{1}{2}$ " of which the tail $1'' 11'''$ Extent of flying membrane $13''$.

$$\text{Incis. } \frac{1-1}{6} \quad \text{Canin. } \frac{1-1}{1-1} \quad \text{Mol. } \frac{4.4}{5.5}$$

4. *Nycticeius noctulinus*, Temminck, apud Schinz, is the very young. Above more or less intense brown or rust-coloured; beneath isabella or light greyish-brown. Entire length three to three two-eighth inches, of which the tail seven-eighth to one two-eighth of an inch. Extent of flying membrane eight six-eighth to nine inches. In this state it has frequently been observed clinging to the mother.

$$\text{Incis. } \frac{2-2}{6} \quad \text{Canin. } \frac{1-1}{1-1} \quad \text{Mol. } \frac{4.4}{5.5}$$

This species is exceedingly numerous, forming large congregations in sheltered situations on the Malayan Peninsula, and in the caves on the numerous islands of limestone which stud the shores from Maulmein to Java, and in such localities large deposits of Guano occur. The latter, ("Ty Klawah" of the Malays, i. e. bats' manure,) has been tried by agriculturists at Pinang, but has been found much less efficacious than the Guano obtained from the swift (*Collocalia*), producing the edible nests.

FRUGIVORA.

GEN.—PTEROPUS, *Brisson*.

PTEROPUS EDULIS, *Geoffroy*.

SYN.—Pteropus javanicus, *Desm.* apud *Horsfield*.

Pteropus Edwardsii, *Geoffroy*.

“Kalong” of the Javanese.

“Klúang” of the Malays of the Peninsula.

HAB.—*Pinang, Singapore, Malayan Peninsula and Islands.*

Java, Sumatra, Banda, Bengal, Assam.

GEN.—CYNOPTERUS, *Fred. Cuvier.*

CYNOPTERUS MARGINATUS, F. CUV.

SYN.—*Vespertilio marginatus*, Buchanan Hamilton, MSS.

Pteropus marginatus, Geoffroy.

Pteropus titthæcheilus, Temm.

Pachysoma titthæcheilus, Temm.

Pachysoma brevicaudatum, Is. Geoff.

Pteropus brevicaudatus, Schinz.

Pachysoma Diardii, Isid. Geoff.

Pteropus Diardii, Schinz.

Pachysoma Duvaucellii, Is. Geoff.

Pteropus pyrivorus, Hodgson, apud Gray.

HAB.—*Singapore, Pinang, Malayan Peninsula and Islands.*

Java, Sumatra, Southern Mahratta Country, Bengal, Nipal.

The colour is very variable, not only individually, but according to age and sex, which has given rise to several supposed distinct species. But they all resemble each other in habits and dentition, they occupy one common place of rest, and their new-born, or very young, are of a uniform colour. The ears of the adult are, in all, more or less distinctly margined with white.

1. *Cynopterus marginatus*. Back reddish, or brownish-grey; lighter underneath.

2. *Pachysoma titthæcheilus*. 3. *Pteropus brevicaudatus*. Male: back reddish or olive-brown; a tuft of hair on the sides of the neck, the chest, and the sides of the greyish abdomen rusty, or orange-coloured. Female: above yellowish, or greyish-brown; beneath lighter. In some individuals from Malacca, the flying membrane is of a light reddish-brown.

4. *Pachysoma Diardii*: Back greyish-brown; abdomen greyish, brown on the sides.

5. *Pachysoma Duvaucellii*: pale greyish-brown.

The following is a description of a new-born. The upper part of the head, the nape of the neck, the back and the posterior surface of the humerus and femur, were covered with dense, soft, short hairs, of a dark greyish-brown; all the rest of the body was naked, of a greyish-black colour. The eyelids were not yet separated. The joints of the bones of the extremities were cartilaginous. The nails of the thumb and index were developed, but the feet and nails of the toes had already attained the size of the adult. The tongue was considerably extensile. The teeth present were:

$$\text{Incis. } \frac{4}{4} \quad \text{Canin. } \frac{1-1}{1-1} \quad \text{Mol. } \frac{2.2}{2.2}$$

Entire length, one and four-eighth of an inch, of which the slightly projecting tail two-eighth inch. Extent of the flying membrane, six and four-eighth inches.

In an individual measuring two and four-eighth inches in length, with an extent of the membrane of nine inches, the face and the lower parts, excepting the throat, had become scantily covered with light brownish-grey, short hairs. The eyelids were separated. The shoulder, elbow, hip, and knee-joints, had become ossified, the other joints still remaining cartilaginous.

INSECTIVORA.

GEN.—TUPAIA, *Raffles*.TUPAIA FERRUGINEA, *Raffles*.

SYN.—“Tupai Press,” *Raffles* and *Horsfield*.

Cladobates ferrugineus, *F. Cuv. apud Schinz*.

Sorex Glis, *Diard and Duvaucel*.

Glisorex ferruginea, *Desmarest*.

Hylogale ferruginea, *Temminck*.

Herpestes, *Calcutta Journ. Nat. Hist.**

* Vol. II, p. 458, Pl. XIII½. The explanation accompanying this figure is as follows: “Searching for Col. Farquhar’s drawing of *Rhizomys Sumatrensis* already referred to, I found in the Society a drawing of a bushy-tailed *Herpestes*, differing merely from Mr. Hodgson’s *Gulo Urva*, in having the tail of one uniform colour with the body, without the yellow tip. There is no name or letter on the drawing to shew

“Tupai tana” of the Malays of Pinang.

HAB.—*Pinang, Singapore, Malayan Peninsula.*

Sumatra, Java, Borneo.

The young of this very numerous species in hilly jungle, is easily tamed, and becomes familiar with its feeder, though towards strangers it retains its original mistrust, which in mature age is scarcely reclaimable. In a state of nature it lives singly or in pairs, fiercely attacking intruders of its own species. When several are confined together, they fight each other, or jointly attack and destroy the weakest. The natural food is mixed insectivorous and frugivorous. In confinement, individuals may be fed exclusively on either, though preference is evinced for insects; and eggs, fish, and earth-worms, are equally relished. A short peculiar tremulous whistling sound, often heard by calls and answers, in the Malayan jungle, marks their pleasurable emotions, as for instance, on the appearance of food, while the contrary is expressed by shrill protracted cries. Their disposition is very restless, and their great agility enables them to perform the most extraordinary bounds in all directions, in which exercise they spend the day, till night sends them to sleep in their rudely constructed lairs in the highest branches of trees. At times they will sit on their haunches, holding their food between the fore-legs, and after feeding, they smooth the head and face with both fore-paws, and lick the lips and palms. They are also fond of water, both to drink and to bathe in. The female usually produces one young; she has four mammæ, the anterior pair of which is situated on the lower lateral part of the chest, the posterior on the side of the abdomen. On the lower surface of the tongue, the frenum is continued to within a short distance of the apex in a raised line, on either side of which the skin is thickened, fringed at the edges, and thus presenting a rudimentary sublingual appendage, somewhat similar

from whence it came, and to prevent its following the fate of Colonel Farquhar's *Rhizomys*, we here afford a copy of it." Pl. XII $\frac{1}{2}$ represents no *Herpestes*: the elongated muzzle, the proximity of the large eye to the ear, which is exposed, and not hidden by the hairs of the cheek, are characters foreign to every known species of *Herpestes*. The draughtsman has very correctly represented a *Tupaia*, and the drawing, reappearing as a *Herpestes* in the *Calcutta Journal of Natural History*, has, by Mr. Blyth, been traced to be the original of Pl. IX, *Asiatic Researches*, Vol. XIV, where it properly accompanies the description of *Sorex Glis*, (i. e. *Tupaia ferruginea*) of MM. Diard and Duvaucel.

to that observed in *Nycticebus tardigradus*; though in *Tupaia ferruginea* the fringes of the margin only are free, the rest being attached to the tongue, but easily detached by a knife. The lateral raised lines of the palms and soles, the posterior part of the first phalanges, and the third phalanx (second of the thumbs,) which is widened into a small soft disk, in fact all the points which rest upon the ground, are studded with little transversely curved ridges or duplicatures, similar to those observed under the toes, of some of the *Geckotidæ*, which fully account for the precision, the 'aplomb,' with which these animals perform the astounding leaps from below, barely touching with the soles the point d'appui above. In a cage, the Tupai will continue for hours vaulting from below, back downwards, poise itself for an instant, continuing back downwards under the horizontal roof, and regain the point of starting, and thus describe a circle—the diameter of which may be three to four times the length of the animal,—in far shorter time than is required for the description. In a young male, measuring from the nose to the root of the tail seven and three-fourth inches, the tail six and a half inches, the dimensions of the intestinal canal were:

Small Intestines,.. 3 feet $4\frac{1}{2}$ inch.; diameter $\frac{1}{8}$ inch.

Large ditto,.. 0 ,, $3\frac{3}{4}$,, ,, $\frac{1}{5}$,,

Cæcum,.. 0 ,, $0\frac{3}{4}$,, ,, $\frac{1}{16}$,,

Costæ veræ: 8 pairs; spuria: 5 pairs = 13 pairs.

This species* is infested with a Tick of the following description: *Ixodes Tupaiaæ*. Body suboval, shining dark-green olive; scaly plate, palpi casing the pointed sucker, and the legs: pale reddish-brown. Length, when swollen, three-eighth inch.

GEN.—GYMNURA, *Raffles*.

GYMNURA RAFFLESII, Vigors and Horsfield.

SYN.—*Viverra gymnura*, *Raffles*.

“Tikus ámbang búlan,” *Raffles*.

HAB.—*Malacca*.

Sumatra, Singapore.

In a district not distant from Malacca, the animal is said to be numerous, though not to be seen in other localities.

* Single light coloured individuals occur with the back, limbs and abdomen greyish, whitish, or isabella.

GEN.—SOREX, *Linné*.

SOREX MURINUS, *Linné*.*

SYN.—*Sorex myosurus*, Pallas, apud Schinz.

Sorex cærulescens, Var, Raffles ?

“Chinchorot” of the Malays of the Peninsula.

HAB.—*Pinang*.

Java.

Dark brownish-grey above; beneath light brownish-grey. Feet and tail flesh-coloured in the living animal, changing to cinereous after death. In the young the colour is more of a bluish-grey, slightly mixed with brown on the back. Length of the head and body five and half inches; tail three inches.

Incis. $\frac{2}{2}$ Canin. $\frac{0}{0}$ Molar, $\frac{8.8}{5.5}$

The present differs from the ‘Musk Shrew’ of Bengal (“Choochundr,”) in its proportionally broader, more developed, and from the head more diverging ear, which characters also distinguish it from *Sorex nigrescens*, Gray, which it somewhat resembles in its colours. The smell of musk, emitted by the adult animal, and which in the young is barely perceptible, is much less intense than that of the Bengal Musk Shrew.

CARNIVORA.

GEN.—URSUS, *Linné*

HELARCTOS, Horsfield.

HELARCTOS MALAYANUS, Horsfield.

SYN.—*Ursus Malayanus*, Raffles and Horsfield.

“Brúang” of the Malays.

HAB.—*Malayan Peninsula*.

Sumatra, Tenasserim Provinces, Assam, Nipal.

Colour of the young: snout and lips pale ferrugineous. Head, back, and outside of the limbs black, mixed with pale rust colour, in consequence of many of the black hairs having the point, or a part next to the

* The following Syn. are given in Gray's *List of Mam. in British Museum*: *Sorex myosurus*, Pallas. Geoff. Ann. Mus. XVII. *S. Sonneratii*, and *S. giganteus*, I. Geoff. Mem. XV. *S. indicus*, Geoff. Mem. Mus. I. *S. capensis*, Geoff. Ann. Mus. XVII. *S. Pilorides*, Shaw, Mus. Lever. *S. cærulescens*, Shaw, Zool. *S. crassicaudatus*, Licht. Säügeth. *S. nepalensis*, Hodgson. *S. moschatus*, Robinson, Assam. Olivier, Voy. Buffon. H. N. Suppl. VII.

point, of the latter colour. Ears, tail, paws, and inner side of the extremities shining black. The somewhat woolly hairs of the abdomen are faintly marked with ferrugineous, and are mixed with longer stiff black hairs. As observed by Schinz, the mark on the breast is very variable in its form. It may be compared to a crescent, assuming according to the smaller or greater breadth of the limbs, the shape of the letter U, of a horse-shoe, or a heart. In the living animal it is of a pale rust, or orange colour, in some individuals with a few small blackish spots, fading after death to a yellowish-white. A very old male presented the following dentition :

$$\text{Incis. } \frac{6}{6} \quad \text{Canin. } \frac{1-1}{1-1} \quad \text{Molar, } \frac{4. 4 (2+2)}{6. 6 (3+3)}$$

In a young female, three feet in length, the intestinal canal measured fifteen feet. It had neither cæcum nor valve to mark the transition. She had ten grinders in either jaw, of which four were spurious, six true.

GEN.—ARCTICTIS, *Temminck.*

ARCTICTIS BINTURONG, *Fischer.*

SYN.—*Viverra* ? Binturong, Raffles.

Paradoxurus albifrons, F. Cuvier.

Ictides ater, F. Cuvier.

Arctictis penicillata, Temminck.

Ictides ater, Blainv. *Calcutta Journ. of Nat. Hist.**

“Unturong” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Tenasserim, Arracan, Assam, Bhotan, Nipal.

Java and Sumatra are quoted by M. Schinz, but neither Dr. Horsfield, Sir S. Raffles, nor M. Temminck, (*Discours Preliminaire, Fauna Japonica,*) mention the *Binturong* as inhabiting either of the two islands.

* In the 3rd Vol. of *Calcutta Journ. of Nat. Hist.* p. 410, occurs the following passage : “The *Binturong* was first discovered in Java, but the first notice of its existence on the continent of India will be found in the second volume of this Journal, p. 457,” (sic!) “&c.” Sir Stamford Raffles, who published the first account of this animal, distinctly states, that it was discovered at Malacca, (not *Java*, as erroneously stated,) by Major Farquhar, and Malacca is situated on the continent of India as well as Tenasserim. The fact of its inhabiting *Bhotan*, was according to Cuvier (*Règne Animal*), first made known by Duvaucel, and the author of the article “*Ictides*” in the *Penny Cyclopædia*, 1838, gives Mr. Hodgson’s authority of the *Binturong*’s inhabiting Nipal, (Kachar, though they occasionally occur in the central region of Nipal.)

The general colour of either sex is black, sprinkled on the body and extremities with pale ferrugineous, produced by some of the hairs having a part next to the point of that colour. In both sexes nearly all the hairs of the head, face and throat are thus marked, which communicates to these parts a whitish or greyish appearance. In the young of either sex there is a faint trace of a white spot over the eyes. The long ear-tufts are always black, the margin of the auricle being either white, or pale rust-coloured. The tail is black, but the hairs of the anterior or basal half, are whitish at the root, or in some uniformly of that colour. The pupil is vertically contracted by the influence of light; the iris is of a beautiful Van Dyke brown. In its habits the *Binturong* is both arboreal and terrestrial, and nocturnal, sleeping till the sun is below the horizon, when it displays great agility in searching for smaller quadrupeds, birds, fishes, earth-worms, insects and fruit. The howl is loud, resembling that of some of the Malayan *Paradoxuri*. The young are easily tamed, but the old animal retains its natural fierceness. Between the anus and penis is situated a large pyriform gland, exceeding two inches in length, partially divided by a deep naked fossa, commencing from the latter organ. The gland secretes a light-brown oily fluid, of a peculiar intense, but not fetid or sickening odour. In a young male, measuring from the nose to the root of the tail, two feet three and five-eighth inches, the tail two feet two and a half inches, the intestines were of the following dimensions :

Small Intestines,	..	..	7 feet 11 inches.
Large ditto,	..	..	1 foot 10 inches.
Cæcum,	..	..	0 $\frac{1}{2}$ inch.

The circumference of the small intestines about seven-eighth inches; of the large but little more, but the rectum was thickened two inches in circumference.

The short cæcum is crescent-shaped, or lengthened pyriform. The stomach is remarkably lengthened cylindrical, the parietes much thickened towards pylorus. Oesophagus enters close to fundus ventriculi, in consequence of which there is but a slight difference between the curvatures.

Length along the greater curvature,	..	1 foot 2 inches.
„ „ „ smaller „	..	1 „ 1 „

The circumference from cardia round fundus ventriculi measured five and a half inches; round pylorus two six-eighth inches. Both the gall-bladder and the spleen presented a remarkably elongated shape. The former organ, lengthened pyriform, measured in length two inches; ductus cysticus two and a half inches. The spleen, tapering to a narrow point, was half an inch broad, and eight and a half inches in length. Costæ veræ, nine pairs; spuria, five pairs = fourteen pairs.

GEN.—MUSTELA, *Linné.*

PUTORIUS, *Cuvier.*

PUTORIUS NUDIPES, *Fred. Cuvier.*

SYN.—*Mustela nudipes*, *Desmar. apud Schinz.*

“*Pulásan*” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Sumatra, Borneo.

The muzzle and the soles of the feet are pale flesh-coloured. The animal is said to inhabit the densest jungle, and is most difficult to obtain.

MUSTELA, *Cuvier.*

MUSTELA FLAVIGULA, *Boddaert.*

SYN.—*Viverra quadricolor*, *Shaw.*

Marte à gorge dorée, *Desmarest.*

Mustela Hardwickii, *Horsfield.*

Martes flavigula, *Hodgson, apud Gray.*

“*Anga Prao*” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Java, Sumatra, Nipal.

The Malayan individuals differ from those from Northern India, originally described, in having the fur shorter and less dense, the head pale-brown, the neck and back pale yellowish-brown, becoming darker towards the tail, which, as well as the posterior extremities, is black. The anterior extremities are greyish-brown; the feet and the streak behind the ear deep brown; the lips whitish; the throat and chest yellowish-white or ochreous; the scanty hairs of the abdomen pale brownish.

GEN.—LUTRA, Storr.

LUTRA NAIR, Fred. Cuvier.

SYN.—*Lutra indica*, Gray.

“Anjing Ayer” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

China, Bombay, South Mahratta Country.

LUTRA BARANG, Raffles.

SYN.—“Barang Barang” or “Ambrang,” Raffles.

Lutra leptonyx, Wagner, apud Schinz.

Lutra Simung, Schinz ?*

“Mumrang” or “Amrang” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Sumatra, Borneo.

The young are very playful, and soon become sufficiently domesticated to roam about the house, and to appear when called. Its voice is a short shrill whistling, not unlike the sound of the cricket, but stronger. Its food is not confined to fishes and crustacea; birds and insects are equally relished. The muzzle is hairy, but in the old animal the hairs become rubbed off. The Malayan individuals appear to attain to a greater size than the Sumatran, described by Raffles. An old male measured from the apex of the nose to the root of the tail two feet eight and a half inches; the tail one foot eight inches. In a young male two feet and two inches, and the tail one foot two-eighth of an inch in length, the simple intestinal canal measured nine feet and one inch, with a circumference throughout of about two and two-eighth inches. No cæcum. Each of the kidneys consisted of ten loosely connected glands.

AONYX, Lesson.

AONYX LEPTONYX, Gray: List.

SYN.—*Lutra leptonyx*, Horsfield.

Lutra cinerea, Illiger.

* In Schinz's diagnosis of *Lutra Simung* is said “ungvibus robustis falcularibus,” (“die Nägel an den Zehen sind stark und gekrümmt”) which if the passage refers to *Lutra leptonyx*, Horsfield, must be a mistake, as the original diagnosis expressly states “ungvibus brevibus sublamnaribus.” As Schinz describes *Lutra Barang* “ungvibus minutissimis obtusis” *Lutra leptonyx* is probably meant, and thus the one species is mistaken for the other.

Lutra perspicillata, Is. Geoff.

Mustela Lutra, Marsden.

Aonyx Horsfieldii, Gray.

Lutra Barang, apud Schinz?

“Anjing Ayer” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Java, Sumatra, Singapore, Nipal.

This, as well as the two preceding species, inhabits numerous the banks of the Malayan rivers, and all are at times used by the Malays in river fishing.

GEN.—*CANIS*, Linné.

CUON, Hodgson.

CUON PRIMÆVUS, Hodgson.

SYN.—*Canis primævus*, Hodgson.*

Chrysæus primævus, Hamilton Smith.

Chrysæus soccatus, Cantor.

“Anjing útan” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Bengal, Nipal.

Some slight differences occur in the Malayan individuals. The inferior surface, the inside of the ears and limbs, the lips and throat, are of the same colour as the back, but much paler. A black carpal spot, like that of the wolf, is very distinct in the male, less so in the female. The young animal of either sex has a faint white spot with a few blackish bristles, situated nearly midway between the angle of the mouth and the ears. Of the wavy wool of the Buansu, the Malayan wild dog, inhabiting a tropical climate, has but a little on the inner side of, and immediately behind the ear; the posterior part of the abdomen is almost naked. The short bristles of the lips, cheeks, throat, and above the eyes, are all black. In habits, so fully described by Mr. Hodgson, and in size, the Malayan agrees with the Nipalese. In a young male, from

* Mr. Ogilby considers *Canis Dukhunensis*, Sykes, and *Canis primævus*, Hodgson, to be identical, and apparently not different from *C. sumatrensis*, Hardwicke, (*Mem. on the Mammalogy of the Himalayahs*, apud Royle.) Colonel Sykes, on the contrary, describes *C. Dukhunensis* as being “essentially distinct from *Canis Quao*, or *Sumatrensis*, Hardwicke.”

the nose to the root of the tail two feet eight and a half inches in length ; the tail one foot, the intestinal canal was of the following dimensions :

Small Intestines,	..	..	..	6 feet	2 inches.
Large, ditto,	..	..	..	0 ,,	10 $\frac{1}{2}$,,
Cæcum,	..	..	..	0 ,,	4 ,,

The latter intestine is spiral, much widened at the origin.

Costæ veræ 8 pairs, spuria 5 pairs = 13 pairs.

The Malays mention another, black wild dog ("Anjing útan étam,") as also inhabiting the densest jungle. A Hyena is also reported to occur on the Peninsula.

Mongrel curs, "pariah dogs," of every description, infest every village, but apparently not uninhabited places, nor localities far distant from the dwellings of man. As they all may be said to be in a state of half domestication, and are of forms very different from the wild dog, which shuns the human presence, their origin cannot with certainty be traced to the Malayan Peninsula.

GEN.—VIVERRA, *Linné.*

VIVERRA ZIBETHA, *Linné.*

SYN.—Viverra undulata, Gray.

Viverra melanurus, Hodgson	} Apud Gray : List.
Viverra orientalis, Hodgson	
Viverra civettoides, Hodgson	
Undescribed Civet, McClelland	

"Tanggalong" of the Malays of the Peninsula.

HAB.—Pinang, Singapore, Malayan Peninsula.

Southern China, Siam, Bengal, Khasyah Hills, Nipal.

Judging by the comparatively few individuals observed in the Straits of Malacca, this species would appear to be far less numerous, than the following. Of several, the largest, which was a female, measured from the apex of the nose to the root of the tail two feet and eight inches ; the tail one foot eight and a half inches.

VIVERRA TANGALUNGA, Gray.

SYN.—Viverra Zibetha, Lin. apud Raffles.

"Tangalung," Raffles.

Viverra Zibetha, Lin. apud Horsfield.

Viverra Zibetha, apud Fred. Cuvier.

Viverra Zibetha, Lin. apud Schinz.*

“Músang jebát” of the Malays of the Peninsula.

HAB.—*Pinang, Singapore, Malayan Peninsula.*

Sumatra, Borneo, Celebes, Amboyna, Philippines.

This species is readily distinguished from *V. Zibetha* by a continuous longitudinal black band occupying the upper surface of the tail, the numerous irregular rings being separated only on its inferior half. (Gray : Proceed. Zool. Society, 1832, p. 63.) The number and distance of the half rings on the lower surface of the tail, vary in different individuals, some of which have either the entire tail, or the anterior half or third of the tail, thus marked, the rest being black. The very young animal is generally of a much darker ground colour than the adult, and the black marks are therefore less conspicuous. Under certain lights the colour appears uniformly black. *Viverra Tangalunga* and *Zibetha*, however similar in habits and general colours, neither live nor breed together. Placed side by side, the living animals present a marked dissimilarity of countenance, which although obvious to the eye, would be most difficult, if possible at all, to convey in words. The female has three pairs of Mammæ, and produces from one to three young. The Malays of the Peninsula distinguish by different names the *Zibetha* and the *Tangalunga*, but as they suppose the civet of the former species to be of better quality, perhaps because it is scarcer, they will frequently offer for sale individuals of the latter, exceedingly numerous species, imposing upon it the name of *V. Zibetha*: “Tanggalong” of the Peninsula. The largest individual of the present species observed, measured in length from the apex of the nose to the root of the tail three feet and one inch; the tail one foot five and a half inches. In a younger, a female, three feet five and a half inches in length, of which the tail one foot and one inch, the intestinal canal was of the following dimensions :

Small Intestines,	..	..	..	7 feet 5 inches.
Large ditto,	..	..	..	0 ,, 9 ,,
Cæcum,	..	..	..	0 ,, 1 ,,

Costæ veræ, seven pairs; spurizæ, six pairs = thirteen pairs.

* The true *Viverra Zibetha*, Linné, is quoted by Schinz under the denominations of *V. bengalensis*, Hardwicke (?), and *V. melanura*, Hodgson.

VIVERRICULA, Hodgson.

VIVERRICULA MALACCENSIS.

SYN.—*Viverra malaccensis*, Gmelin.

Viverra Rasse, Horsfield.

Viverra Gunda, Buchanan Hamilton MSS.

Viverra indica, Geoffroy.

Viverra bengalensis, Gray : Illustr.

Viverra pallida, Gray : Illustr.

Genetta Manillensis, Eydoux.

HAB.—*Malayan Peninsula*.

China, Philippine Islands, Java, Singapore, Cochin-China, Tenasserim Provinces, Bengal, Nipal, Hindoostan, Dukhun, Bombay.

On the Malayan Peninsula this species appears to be more numerous than *V. Zibetha*; less so than *V. Tungalunga*, and in size inferior to either. The largest observed was three feet four inches in length, of which the tail one foot three and a half inches. In a male, measuring from the apex of the nose to the root of the tail, two feet and three-fourth of an inch, the tail one foot one inch, the dimensions of the intestinal canal were :

Small Intestines,	..	..	..	4 feet 0 inch.
Large ditto,	..	..	..	0 ,, 8 ,,
Cæcum,..	..	..	..	0 ,, 0 $\frac{3}{4}$,,

The three preceding species have the following characters in common—The pupil is vertical, oblong; the iris of a rich brown. They are arboreal as well as terrestrial, preying upon the smaller quadrupeds, birds, fish, crustacea, insects and fruit. Naturally very fierce, they are scarcely reclaimable except in youth, but with age the original disposition returns. Their voice is peculiar, hoarse and hissing.

GEN.—PRIONODON, *Horsfield*.

PRIONODON GRACILIS, *Horsfield*.

SYN.—*Viverra*? *Linsang*, *Hardwicke*.

Felis gracilis, *Horsfield*.

Viverra Hardwicke, *Lesson*.

Viverra gracilis, *Desmarest*, apud *Schinz*.

Linsang gracilis, *Müller*, apud *Gray*: *List*, and *Schinz*.

HAB.—*Malayan Peninsula.*

Java, Sumatra, Borneo, Siam.

The ground colour is buff, and the dark marks are of a deep snuff colour, inclining to black with purple reflection. Length from the apex of the nose to the root of the tail: one foot six inches, the tail one foot three six-eighth inches.

Mr. Rappa, for many years a dealer in objects of natural history at Malacca, who previously had been supplied with a figure and description of *Prionodon gracilis*, reported in a memorandum accompanying the specimen, that it had been captured in the jungle at some distance from Malacca. It was unknown to himself and to the natives. At first the animal was fierce and impatient of confinement, but by degrees it became very gentle and playful, and when subsequently suffered to leave the cage, it went in search of sparrows and other small birds, displaying great dexterity and unerring aim in stealthily leaping upon them. Fruit of every description it refused. Another younger individual was captured about the same time, but contrived to make its escape.

GEN.—*PARADOXURUS*, *Fred. Cuvier.*

PAGUMA, Gray.

PAGUMA LEUCOMYSTAX, Gray: List?

SYN.—*Paradoxurus leucomystax*, Gray?

Amblyodon auratus, Jourdan?

“*Músang búlan*” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Singapore, Sumatra.

In a single individual observed, the hairs of the body, limbs and anterior third of the tail, are greyish-yellow at the base, next bright rust-coloured, with the apex shining black, which produces a mixture of ferruginous and black, the latter prevailing on the nape of the neck, middle line of the back, and the anterior third of the tail. The hairs of the vertex and the ridge of the nose are dark at the base, with yellowish points. The large oblique whitish spot in front of the ear, produced by uniformly whitish hairs, is on either side blended with the whitish vertex and ridge of the nose, and is continued down the sides of the neck, forming a large broad arrow-shaped mark. The orbits are dark brown, the face, lips and throat pale brown. The long rigid white

whiskers are mixed with a few shorter black bristles. The feet are dark brown, the posterior two-thirds of the tail uniformly black. The lower surface and the inner side of the extremities are pale ferruginous. From the apex of the nose to the root of the tail: two feet three inches, the tail one foot eight inches.

PAGUMA TRIVIRGATA, Gray: List.

SYN.—*Viverra trivirgata*, Reinwardt, Mus. Leyd.

Paradoxurus trivirgatus, Gray.

“Músang ákar” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Singapore, Tenasserim.

The ground colour varies from yellowish, or brownish, to blackish-grey. Fur short, peculiarly soft, silky. The dorsal streaks are either continued, undulated, (the central nearly always,) or composed of separate black spots. Some individuals have a short white streak on the ridge of the nose. The largest male measured from the apex of the nose to the root of the tail, two feet two and a half inches; the tail two feet three inches.

PARDOXURUS MUSANGA, Gray.

SYN.—*Viverra hermaphrodita*, Pallas, apud Schinz.

Viverra fasciata, Gmelin?

Viverra Musanga, Marsden, Raffles.

Musang bulan, Raffles.

Viverra Musanga, Var. *javanica*, Horsfield.

Ichneumon prehensilis, Buchanan Halmilton MSS.

Platyschista hermaphrodita, Otto

Paradoxurus Pallasii, Gray

Paradoxurus Crossii, Gray

Paradoxurus dubius, Gray

} apud Schinz.

Paradoxurus Musangöides, Gray.

Paradoxurus typus, apud Schlegel.

Paradoxurus felinus, Wagner, apud Schinz.

“Músang” or “Músang Pándan,” (when the tail is with white point: “Músang Búngkwang,”) of the Malays of the Peninsula.

HAB.—*Pinang, Singapore, Malayan Peninsula.*

Java, Sumatra, Borneo, Timor.

The ground colour and dorsal marks of this exceedingly numerous species are liable to considerable variations, the principal of which are noted by Schinz: individuals occur (probably of every species) with the apex of the tail white, with elongated white spots on the abdomen, with the tail spirally twisted. In most the dorsal marks become indistinct, or invisible in certain lights. The female has from one to three young, of colours similar to the adult, but less distinct, their fur is softer, somewhat woolly, mixed with longer stiff black hairs. The young is tamed without difficulty, and is sometimes kept in houses to destroy rats and mice. The *Paradoxuri* are in habits like the *Civets*. They have an elliptical pupil, vertically contracted by the influence of light. Their glandular secretion is of a peculiar, not civet or musk-like odour. The largest specimen of a great number, measured from the apex of the nose to the root of the tail two feet and half an inch; the tail one foot four and a half inches. In a male, measuring three feet one and a half inch in length, of which the tail one foot four and a half inches, the intestinal canal were of the following dimensions:—

Small Intestines,	..	..	..	5 feet 8 inches.
Large ditto,	..	..	..	0 ,, 5 ,,
Cæcum,	..	..	..	0 ,, 1½ ,,
Costæ veræ, seven pairs; spuria, six pairs = 13 pairs.				

PARADOXURUS (?) DERBYANUS, Gray.

SYN.—*Paradoxurus*? *Zebra*, Gray.

Hemigalea Zebra, Jourdan.

Viverra Boiei, Müller.

“Musang Batu” or “Sangah Prao” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Borneo.

The ground colour varies from pale ochreous to buff, and the dark marks in shape and number scarcely alike in any two individuals, from snuff colour to black. The species is apparently not numerous, and is celebrated among the Malays for its great agility. It is said chiefly to feed upon the larger birds, such as the *Argus* pheasant, which it will hunt down, following its prey till the strength of the latter is exhausted, when it falls an easy victim to the indefatigable pursuer. The slender vermiform make, the countenance and distribution of

colours ; the serrated, flattened false molars ; the soles, hairy between and under the toes, and slightly in the centre ; the somewhat removed thumb, are characters by which this animal differs from *Paradoxurus*, and forms a link between that genus and *Prionodon* in the same manner that *Viverricula* connects *Viverra* to *Prionodon*. The largest male observed measured from the apex of the nose to the root of the tail two feet ; the tail one foot and four inches.

GEN.—CYNOGALE, Gray.

CYNOGALE BENNETTII, Gray.

SYN.—*Viverra* (*Limictis*) *carcharias*, Blainville.

Potamophilus barbatus, Kuhl.

Cynogale barbata, Schinz.

HAB.—*Malayan Peninsula*.

Sumatra, Borneo.

The very young, of which two individuals, a male and a female, were found with the mother, differ from the adult in having a very soft, silky, dense fur, mixed with longer hairs, which are black, except on the chest and abdomen, where the apex is silvery. Over the tarsus and on the upper surface of the feet some of the hairs have a subterminal white band, close to the black apex. The posterior margin of the ear is hairy and of a silvery colour. This animal appears to be of rare occurrence on the Malayan Peninsula, and the natives are consequently not acquainted with it. The largest male examined measured from the apex of the nose to the root of the tail two feet three inches ; the tail eight inches.

(*To be continued.*)

Notes, chiefly Geological, on the Coast of Coromandel, from the Pennaur to Pondicherry. By Captain NEWBOLD.

The coast from the mouth of the Pennaur to Madras, is a sandy plain, covered with reddish sandy loam which occasionally passes into clay, and generally rests upon the bluish-black marine clay of the Coromandel. It has been already said, that the breadth of the latter stratum varies, and is interstratified with layers of sand and reddish clays;—the whole resting usually on granitic or hypogene rocks: nodules and masses of a concretionary sandstone are found imbedded in the sands close to high-water mark, often perforated by lithodomi. Magnetic iron sand is found in many situations mingled with the sea sand, derived probably from the hornblende and basaltic greenstone rocks. This iron sand occasionally, I suspect, contains potassium, and strongly resembles iserine in external character.

Farther inland, between the base of the ghauts and the sea, extend thin beds of laterite, and sandstone closely allied to laterite, passing into puddingstones and soft shells of various colours.

The puddingstones usually imbed rounded pebbles of white quartz, and of the older sandstone which crests the eastern ghauts near Nagghery, Udegghery, &c.

The beds of this sandstone rarely exceeds three or four feet in thickness, and may be seen near Sri Permatoor, on the great western road, (vide Notes from Mangalore to Madras), and, according to native information, in the vicinity of Parmaulnaignpet, about six and a half miles to the E. by S. of Tripassore, a little north of the road to Madras. Their continuity, and that of the laterite beds, with which they are probably contemporaneous, has been much interrupted by aqueous denudation, which probably took place while the Coromandel Coast was emerging from the bed of the sea.

It is also probable that these sandstone strata were once continuous with those imbedding silicified wood at Pondicherry and Verdachellum in south Arcot.

These remarks are merely thrown out to elicit farther investigation and research into the age, and extent on the coast, of these interesting littoral deposits, by which we may be enabled, probably, to mark out the ancient lines of coast formed, as the land gradually rose.

From its flatness the plain of Coromandel has been usually neglected by geologists as of little promise, but I trust, these remarks will prevent observers from running over it in the dark.

The sandstones and slate clays should be diligently examined for organic remains, as after all, it is possible, they may be freshwater deposits.

Of the sea and its inroads upon the land, from the Pennaur to the mouth of the Cauvery, the natives preserve many wild traditions, which I have little doubt originated in a sinking of this part of the coast.

In a Mahratta MS. of the Mackenzie collection,* there is a legend of the origin of the town of Sri-hari-cota, on the south boundary of Telinghana, close to the west shore of the Pulicat lake, which states the submersion of another town; the ruins of which, according to the MS. are still to be seen underneath the water. Trisanu, a king of the Solar race, is said to have been founder of it.

The miracle of the sea shell passing by a subterranean passage to the Pandurangha temple, might have originated from the circumstance of subterranean beds of marine shells being found, as at Madras, &c. inland.

The Pulicat lake is a lagoon running down the coast from Derazpatumam on the north, to Pulicat on the south, nearly forty miles long, and varying in breadth from a few yards to twelve miles. A spot of sand from a quarter of a mile to five miles broad, running parallel with the coast, separates it, excepting four narrow openings, from the Bay of Bengal. Three of these openings are at its northern and southern extremities, and the other between the hamlets of Ryadooroo and Dayullum.

The lake is studded with numerous islets: its inland or western shore is low and sandy, furrowed by numerous rills which run down during the monsoon from the sides of the eastern ghauts, (here having the local name of the Pulicat hills), about eleven miles to the westward.

The lake is in general shallow, and its formation is attributed to the sea bursting through the sand-bank in front on the low ground inland, now its bed. I am not aware of any other tradition which refers its origin to the historic period, except that just alluded to.

* Madras Journal, No. 30, p. 86.

Madras.—Granite and the hypogene schists, have been before stated as the rocks basing the more recent deposits covering the level plain of Madras. In the bed of the river (Adyar) near Marmalong bridge, and on its right bank at the quarries for the old breakwater, in the park of Guindy, around the race course, it usually contains but little mica, being composed of grains of a greyish quartz, with white felspar usually weathered and earthy on the exposed bosses and blocks in which the rock makes its appearance. Much of the granite near the Little Mount I found to be pigmatitic, that is, a binary granite of felspar and quartz, without mica.

Laterite is seen overlying the granite at the breakwater quarries before mentioned, and I am informed by Capt. Worster, that beds of this rock occur about a mile north of Nabob's Choultry on the Poonamalee road;—also near Tremungalum, about two miles NE. of Santivellore; near Vungada, about two miles SE. from Sri Permatoor; at Cotrumbaucum, half a mile north of Raja's Choultry, and about two miles north of Balchitty Choultry; besides the beds at the Red hills, about eight miles NW. from Madras, so ably described by Mr. Cole, and which occupying an area of about fifty miles, cover an undulating tract, elevated usually forty or fifty feet above the general level of the country. Those near Sri Permatoor tank, I have already noticed (vide notes from Mangalore to Madras.)

At the bases of St. Thomas' Mount and the Palaveram Hill, granite is seen outcropping, and it also forms some of the smaller hills in the vicinity of Palaveram.

Both the Palaveram Hill and that of St. Thomas' Mount, are composed for the most part of a massive variety of hornblende rock, in which stratification is indistinct.

This rock, though often entirely composed of black brilliant hornblende, at Palaveram is usually a dull olive-green colour, translucent at the edges, and appears to be a mixture of hornblende and felspar, with a small proportion of quartz, in an almost homogeneous mixture. This rock occasionally imbeds garnets, crystallized schorl, hornblende, and a little dark mica. A little to the SSE. of the Mount, near the tank, is a lateritic bed.

The height of the Palaveram Hill, on which the bungalow built by Col. Coombes stands, Lieut. Ludlow informs me, is nearly $345\frac{3}{4}$ feet above the plain at its base.

Chingleput.—This is the judicial head-quarters and capital of the Jaghire of the same name ; it is situated about thirty-six miles to the SSW. of Madras, at the base of a small cluster of hills ; the loftiest not being higher than the Flagstaff hill at Palaveram, and composed of a precisely similar variety of hornblende rock (garnetiferous), and associated with binary granite, or pigmatite.

The hornblende rock passes into light shades of green. It has been largely used as a building stone in the construction of the fort, which is extensive, and said to be nearly two miles in circumference. It, as well as the town, lies on a stream, which falls into the Palaur, about half a mile to the west, almost surrounded by this hilly cluster. A wet ditch surrounds the outer walls which enclose a citadel,—the remains of the ancient palace of the native princes, government offices, and barracks, &c. Near the outer gate is a weaving establishment : and on a neighbouring eminence stands the European burial ground. The native town is populous ; the houses are, for the most part, built of mud, thatched, or tiled.

Chingleput was early a place of importance, and for some time the residence of the Hindu princes of the Bijanugger dynasty.

During the early wars, when the French and English were struggling for empire in the East, the occupation of Chingleput, which lies on the great southern road to Madras from Pondicherry, was a point of much consequence. It was captured by the French in 1761, but retaken the following year by Capt. Clive. It was here the English army under Sir Hector Munro retreated (11th September, 1780) from Conjeveram, after the fatal massacre of Baillie's detachment near Perambaucum.

The soil in the vicinity is sandy, but in some places overlies a stiff clay used for bricks and tiles. The cultivation is principally of rice, irrigated by a tank which lies to the east of the Madras road.

Carangooly.—The sandy bed, sometimes occupied by a muddy torrent of the Palaur, is crossed about two and a half miles SW. from Chingleput. It is about three-quarters of a mile from bank to bank. This river, which takes its rise in the table lands of Mysore in the elevated tracts, (their water sheds) between Colar and Nundi-droog, pursues a SE. course by Baitmungalum and Watlaconda-droog, to the Pullur gap in the eastern ghauts, whence it descends to the vale of Amboor. Here, following the north-easterly direction and slope of the valley which it

fertilizes, it washes the feet of the eastern ghauts, receiving many mountain tributaries to the base of Amboor-droog; whence, turning the northern flank of the Rajahpollium and Javadie hills, which bound the right of the valley, it escapes easterly by Paliconda to Vellore. Thence it crosses the Carnatic increased by the Poni; by Arcot, Wallajahbad, Conjeveram, and Chingleput to the Bay of Bengal, into which it flows about three and a half miles, south of Sadras, in latitude $12^{\circ} 28' N.$ after a course of about 220 miles, marked during its progress through the Carnatic by a narrow, verdant, winding zone of rich vegetation.

The road from Chingleput to Carangooly lies at no great distance, for the first and greater part of its course, from the right bank of the river, over the plain on which the town and fort of Carangooly stand, to the eastward of the large tank, and about thirteen miles SSW. from Chingleput. A few low hills in the vicinity mark the prolongation of the bed of hornblende rock observed at St. Thomas' Mount, Palaveram, and Chingleput. The prevailing soil is a sandy loam.

Carangooly, like Chingleput, during our early wars with the French, was a military post of great importance, though now reduced to insignificance. The gates of the fort were blown open, and the place stormed by Capt. Davis (January 24th, 1781): Hyder's garrison was 700 strong.

The fort was dismantled by General Stuart, in February 1783.

Permacoil.—The route to Permacoil lies over a plain less cultivated and more jungly than hitherto; varied at Acherowauk by a range of hills running for two or three miles in a SW. direction, flanking the right of the road. At Permacoil the granitic rocks rise above the surface in clusters varying from 100 to 300 feet high. The chief mass is composed of felspar, quartz, mica, and hornblende, in some places veined by a porphyritic granite with large plates of mica. The mica is sometimes entirely replaced by hornblende in the same mass, and would be termed a syenite by many geologists. I picked up a few crystals of adularia in the gravelly detritus of a weathering vein, and some fine specimens of an iridescent felspar. The felspar, which prevails in the substance of the rocks, is reddish, and the mica dark coloured, but it sometimes occurs in rich gold coloured scales and plates.

The soil is a greyish, friable loam, passing into reddish and sandy, and usually rests on a bed of kunker; below which, in a bed of sand and gravel, water is found at depths of from eight to fourteen feet from the

surface. The surrounding country is generally rocky and jungly. Rice, raggi, kovaloo, and bajra are the staple articles of cultivation.

With the exception of two or three families of Palicars and Brahmins, speaking Telinghi, the inhabitants are chiefly of the Pallaywar caste, and speak Tamul: there are still a few Mussulmen left here. The town is situated a little south of the tank bund, at the western base of the rocks, and is said to contain about 600 houses.

The remains of the fort stand on a steep rock, overlooking the town, about 300 feet high, and not commanded by any of the surrounding heights. Like Carangooly and Chingleput, it became of importance as a military post during hostilities with the French. In 1760 it was taken after a severe assault by Sir Eyre Coote, who was wounded here; besieged by Hyder in 1781 but not taken, and again in combination with the French in 1782, to whom it was compelled to capitulate on the 6th May.

It was subsequently blown up and dismantled: but in the succeeding war with Tippoo, it was held as a post of observation by a company under an officer, which was cut off by Tippoo in 1791.

Murtandi Choultry.—This place is situated on the celebrated Red hills which run to the rear of Pondicherry, from which it is about four and a half miles NNE. These beds of sandstone, which extend probably farther to the NE. will be described more fully when speaking of Pondicherry. They overlie the Neocomien limestone beds, which are seen outcropping nearer the sea to the NE. in the vicinity of Conjimere, about ten miles north from Pondicherry, on the Madras along shore road, &c. which passes by Sadras and the seven Pagodas—the ruins of Mahabalipuram, or Mavellipuram, as it is called by natives. These ruins lie among a cluster of low rocks which project from a sandy spit running down the coast from Covelong to Hedoor, a distance of about sixteen miles in breadth. It varies from half a mile to one and a quarter of a mile. In front, dashes the everlasting surf; in rear lies a salt marsh of upwards of a mile broad in some parts, and communicating with the sea on the south and north extremities of the sand bank in its front, by two narrow openings. The principal sculptured rocks lie about two and three-quarter miles from the south extremity of the bank, almost abreast, but a little south of, the Chingleput hills already described. In the monsoon they are insulated from the main-land by the inundation of the salt marsh in their rear.

A series of bare granite rocks, naturally of fantastic contour, nearly a mile long and 120 feet high, has afforded the Hindu artist ample scope for the exercise of his chisel, which must have been wrought of the finest tempered steel, for which India, since the dawn of history, has been justly celebrated. The bronze tools of the Egyptians might answer well enough in the limestone quarries around old Cairo, in working the blocks which constitute the great bulk of the pyramid, but would be of little avail in the quarries of Syene, a type of whose granite we find in the redder felspar. Quaternary granites compose the great monolith *raths* of the seven pagodas—a mixture of red and white felspar, white quartz, dark mica, and hornblende. It is more than probable that Indian steel found its way into Egypt during the early traffic that is known to have subsisted between India, Judæa, Yemen, and Egypt. It is absurd to suppose, that the sharply cut and deeply engraved hieroglyphics which cover the granite obelisks of Egypt, were done with chisels of bronze, even armed with corundum dust.

Quintus Curtius informs us, that Porus presented Alexander with a quantity of steel as one of the most acceptable and valuable gifts India could offer.

The granite blocks here, as elsewhere in India, are subject to spontaneous concentric exfoliation and splitting. The globular mass apparently about sixty feet in circumference, which we see nicely poised on a convex mass of granite—the pat of butter petrified by the god of milkmaids, Krishna—is ascribable to the first process; and the rents in the sculptured rocks—one of which cleaving the monolith pagodas, was ascribed by Mr. Chambers to a violent earthquake—have doubtless been caused by the latter process of spontaneous splitting.

With regard to the Brahmanical history of the seas overwhelming the ancient city and rolling over its ruins at the fiat of the God of the Heavens, Indra, who, it is said, loosed the chains of the ocean and overwhelmed its wicked ruler Malecheren, there are few facts that can be relied on—except that pieces of pottery, Roman and Chinese coins, are occasionally washed ashore in storms, and the remains of ruins and sculptured rocks are at a little distance in the sea.

From a multitude of enquiries which I have made regarding the encroachment of the sea on various parts of the Coromandel Coast, I am led to think, that the shore has been subject, like that of the Baltic, to

undulations, causing the sea to encroach and recede in different parts. Marks on the rocks, as on those of the Baltic and Caspian, would serve to determine the question.

From the inscriptions hitherto deciphered, nothing decisive has been obtained as to the date of the sculptures. In the 3rd report, by Taylor, on the Mackenzie MSS. section 9, we find it stated that in the Cali Yuga, Singhama Nayadu, a zemindar of the Vellugotivara race, ruled at Mallapur, (Mavellipoor). In that time during a famine many artificers resorted hither, and wrought on the mountain a variety of works during two or three years. Ignorant people term these things the work of Visvacarma; but, (says the writer) the marks of the chisel remaining disprove that opinion. Besides Singhama Nayadu built a palace on the hill, of which a few fragments now only remain. "In another MS. we find a Singhama Nayadu mentioned as son of Vennama Nayadu, and who became head of his race, and whose brother made successful incursion against Canchi and the Pandya kings, and beat the Musulmans."

There must be always some doubt until the identification of this Singhama of the Cali Yuga and the Singhama who lived at the time of the Mohomedan invasion, a period not more remote than the 7th century of the Christian era.

Mr. Walter Elliott, with the aid of inscriptions he has lately brought to light at Idian Padal, two miles north of Mavellipoor, in old Tamil characters, one of which bears the name of Tribhuvana Vira Deva, a Chola king—and other collateral evidence—infers that its rulers were in a state of independence during the 6th and beginning of the 7th centuries.*

None of these inscriptions bear the special number of the year, but Mr. Elliott mentions one, in the neighbouring hamlet of Parajaskaran Choultry—in the same character as those of Idian Padal, and Varaha Swami—as bearing the name of the reigning sovereign Vikrama Deva, and the date of 1157 of the Salivahana era. The other names of sovereigns that occur, are Kama Raja and Ati Rana Chanda Pahava.

These inscriptions referred merely to grants and sales. The time in which Tribhuvana Vira Deva ruled remains to be fixed. But even when this is accomplished, we shall be still in the dark as to the exact date of

* Madras Journal, No. 30, for June 1844.

these singular sculptures which resemble,* as Mr. Fergusson justly observes, in plan and design the Hindu series at Ellora, though many of their details are only to be found at Ajunta and Salsette. It is evident, however, that the rocks were executed under the direction of priests of Siva and Vishnu, as no traces of Buddhism or of the Jains are seen.

From the inscriptions hitherto brought to light, I coincide with Mr. Elliott in supposing that the character in which some of them are written, (Grantham and Nagri) are not older than the 6th century. The freshness of the chisel-marks on the granite on which Mr. Taylor and some other antiquarians found, in part, their suppositions of a still more modern origin, (viz. from 300 to 500 years) cannot be relied on, as the marks in the quarries of Syene, and in the defile leading from Thebes to Cossier testify.

One general remarkable feature in these sculptures remains to be noticed, viz. that they have been left apparently in haste, being all unfinished. Mr. Goldingham mentions a tradition of the workmen, who had emigrated from the north, having suddenly been recalled by their prince before they had completed them. This tradition, and the similarity of the sculptures to those of the Deccan, are in favour of the theory that they are not the work of the inhabitants of the country, yet the inscriptions in the old Tamul character must have been executed probably at a later period than the others, under the directions of the Tamul or Chola princes, or priests.

I am not aware whether the inscriptions on the monolith *Ruths* have as yet been fully deciphered. It is probable they may throw light on the era of the Ati Rana Chanda, the lord of kings, who is declared by the inscription on granite, (north of the pagoda, two miles north of the place) to have built it; and of the Kama Rajah who founded the temple to Siva, according to the Sanscrit inscription in the temple of Ganesa. The antiquity of these inscriptions beyond a certain era may be negatively inferred from the absence of the date either Vikramaditya or Salivahana.

The Revd. Mr. Taylor, who has catalogued the Mackenzie inscriptions, states, that he has not met with inscriptions with a defined year higher

* Journal Royal As. Soc. Part. I, No. XV, p. 88.

up than the 10th century*. I have only met with one of the 9th century on stone, but copper grants have been found with earlier dates extending to the 5th century.

Pondicherry.—From Murtandi to Pondicherry, the loose sandstone of the Red hills extends on the right, and a sand-covered beach on the left. The nature of the substrata at Pondicherry has already been described in the notes from Pondicherry to Beypoor.

A Canal Act of the Emperor Akbar, with some notes and remarks on the History of the Western Jumna Canals. By Lieut. YULE, Engineers, First Assist. W. J. C.

For the following translation of a Decree of the Emperor Akbar, forming an interesting Appendix to the History of the Canals, given by Colonel Colvin in the 2nd volume of the Journal of the A. S., I am indebted to the kindness of Capt. S. A. Abbott, in charge of the Kythal district, who obtained the Persian copy from the parties named below, residents of Dhátrat, a town on the southern boundary of Kythal, just at the point where the Hansi branch of the Western Jumna canals enters the Chitang Nálá, in the old channel of which, deepened and widened, the canal waters flow to their termination at Baháderá, in the Bikaner territory.

Translation of a Sanad of Akbar Sháh Bádsháh, dated month of Shawál, A. H. 978, [A. D. 1568] at Fírozpúr, in the Province of Lahaur. Obtained from Abdul Samad and Abdul Mustakím, Pírzádahs at Dhátrat, being four leaves abstracted from a book which bears the appearance of considerable antiquity.

“ My Government is a tree, the roots of which are firm in the earth, and being watered by the waters of God’s grace, its branches reach to Heaven. In acknowledgment of God’s mercy in establishing this great empire, my desire, purer than water, is to supply the wants of the poor ;

* Madras Journal, No. 30, p. 41.

and the water of life in my heart is larger than the sea, with the wish to dispense benefits, and to leave permanent marks of the greatness of my Empire, by digging canals, and founding cities, by which too the revenues of the Empire will be increased.

“God says, sow a grain, and reap sevenfold(a). My desire is to reap one-hundredfold, that my crown may become wealthy, and that the zamindars may obtain double returns.

“The seeds sown in this world, are reaped in thé next.

“The Omnipotent God gives power to whom he pleases.

“The following is the best purpose to which my wealth can be applied, viz.—

“The Chitang Naddí, by which Fíroz Sháh Bádsháh, two hundred and ten years ago, brought water from the nálás and drains in the vicinity of Sádhaura(b), at the foot of the hills, to Hánsí and Hissár, and by which for four or five months in the year water was then available, has, in the course of time, and from numerous obstacles, become so choked, that for the last hundred years, the waters have not flowed past the boundary of Kythal, and thence to Hissár, the bed has become so choked, that it is scarcely discernible; since which time, the inhabitants of those parts have become parched with thirst(c), and their gardens dried up.

“Now that I have given the district (Sarkár) of Hissár to the great, the fortunate, the obedient, the pearl of the sea of my kingdom, the star of my government, the praised of the inhabitants of the sea and land, the apple of my kingdom’s eye, my son Sultán Muhamad Salím Bahádur(d), (may God grant him long life and greatness); my wisdom wishes that the hopes, like the fields of those thirsty people, may, by the showers of liberality and kindness, be made green and flourishing,

(a) “The similitude of those who lay out their substance, for advancing the religion of God, is as a grain of corn which produceth seven ears, and in each ear a hundred grains.”—*Sale’s Korán, Ch. II.*

(b) Sádhaura, a town of the Ambálá district, about twenty miles west of the Jumna. The river flowing past Sádhaura is the Markanda, but the sources of the Chitang are only seven or eight miles distant.

(c) In Hariáná the springs have been raised, since the canal was re-opened, in some instances as much as sixty feet.—Capt. Baker’s Report on the Sutlej and Jumna Canal.

(d) Afterwards the Emperor Jahángír, who was at this time under two years of age. “The Sirkár of Hissár Fírozeh, ever since the conquest of Hindoostan by the Moguls, has constituted the personal estate of the heir apparent of the empire”—*Rennel.*

and that the canal may, in my time, be renewed, and that by conducting other waters into it, it may endure for ages.

“ For God has said, from water all things were made. I consequently ordain, that this jungle, in which subsistence is obtained with thirst, be converted into a place of comfort, free from that evil.

“ Consequently, in the year of the Hijra 977, my Farmán, bright as the sun, and obeyed by all the world, went forth ; that the waters of the nálás and streams at the foot of the hills at Khizrábád(e), which are collected in the Sonb river and flow into the Jumna, be brought by a canal, deep and wide, by the help of bunds, &c. into the Chitang Naddí, which is distant from that place about one hundred kos(f), and that the canal be excavated deeper and wider than formerly, so that all the waters may be available at the above mentioned cities, (Hansi and Hissár) by the year 978.

“ Behold the power of God, how he brings to life land that was dead(g).

“ Truly a canal is opened, and from the source to the mouth, although the zamindars and cultivators take by cuts abundance for their crops, it is still sufficient to meet the demand.

“ Because this canal was renewed for the sake of my beloved son, in compliment to him, whom, in his childhood, I call *Shekko*, and because in Hindustani a canal is called *Nai*, I have called this canal the *Shaikh Nai(h)*.

“ And whereas Muhamad Khán Tarkhán was superintendent of this work from first to last, I have conferred upon him the office and title of *Mír-áb*.

[Here follows a flourish of the writer of the Sanad.]

“ The following verses have arisen from the ocean of my heart to the shores of my lips :

“ Muhamad Akbar Ghazí Jaláluddín.

“ He is the king of this age, and equal to king Jamshaid.

(e) Khizrábád, a Sikh town near the debouchement of the Jumna from the Hills, and the present Delhi Canal head.

(f) Dhátrat, where the present canal joins the Chitang, is by the line of the banks about 130 miles (pretty exactly 100 kos of the country) from Khizrábád.

(g) God sendeth down water from Heaven, and causeth the Earth to revive, after it hath been dead.—*Sale's Korán, Ch. XVI.*

(h) This title appears to have been very short lived. I am not aware that the word *Nai* is now applied in this sense in any of our canal districts, but I learn that it is the Panjábí corruption of *Naddi*, and is commonly applied by the Sikhs to a river or water-course. The valley of the Ghagar is called *Naili*.

“ His throne is the throne of Farídún and Kai.

“ He is like unto Khizr, and from the waters of his generosity every thing has life.

“ He is such a king, that from the canal of his liberality, the garden of the world is green all the year round.

“ A canal by his orders was carried to Hissár ;

“ For the sake of the Prince Salím of blessed steps.

“ A canal like milk, and that milk full of fish ;

“ Its waters like honey, and pleasanter than wine.

“ The king in his great kindness gave Muhamad Salím the title of Shekho, because his Pír (spiritual patron) was a Shaikh(i).

“ He consequently called this canal Shaikh Nai.

“ May the Bádsháh and Prince live for ever.

“ The date of excavating this canal is to be found in the following words :—

(j) اباديخ ني

“ Tarkhán obtained the title of Mír-áb for his labours, because he carried the waters of the canal in every direction.

“ As long as the new moon, like a boat, sails in the waters of the blue heavens, so long may the waters of this king’s generosity irrigate the garden of the world.

“ Whereas I have ordered that the waters be collected in this canal, and that it be made so wide and deep to Hissár, that boats may ply upon it in every part ; it is my will that the superintendent build bridges and bunds wherever necessary(k), that at the season of cultivation a sufficient supply of water be given to all who aided in excavating the canal, and they obtain water all the year round.

(i) It is said that Akbar having had no child who survived infancy, made a pilgrimage to offer his prayers for posterity at the shrine of Mugínuddin Chishtfat, Ajmir. He was there directed to seek the intercession of the Shaikh Salím Chishtía Síkrí ; and shortly afterwards the favourite Sultana was delivered of a son, who in honour of the saint was called *Shekho Salim*. A village on the canal near Hissár bears the name of Salfma Shekhopoor.

(j) ا ب د ش ي خ ن ي (j)

(k) The only old bridges now existing between the canal head and Hansi are, that called the Gharaunda bridge, near Karnal, and one at Safidan ; both massive structures with pointed arches.

“ Also, that on both sides of the canal down to Hissár, trees of every description, both for shade and blossom, be planted(*l*), so as to make it like the canal under the tree in Paradise, and that the sweet flavour of the rare fruits may reach the mouth of every one, and that from these luxuries a voice may go forth to travellers, calling them to rest in the cities where their every want will be supplied, and I trust that, from the blessing attending this charity, the garden of goodness may remain ever green, that the benefits of the blessing may be incalculable, and that from it, I may obtain eternal reward.

“ Thanks be to God who has enabled me to do this, which, without his instruction, I should not have performed.

“ It is necessary that every one acknowledge the person appointed to this work, and recognize no partner with him.

“ Should it be necessary to construct a bund, or any other work on the canal, all Shikkdars(*m*), Chaudrís, Mukaddams, and Rayats, whether of the Khalsa or of other Parganahs, will give the necessary assistance in labourers, &c. and delay not.

“ Every Parganah will be satisfied with the number of cuts made by the Mír-áb, and take no more, and on every occasion abide by his directions. He has the power to punish as he sees fit every one who takes water out of season; whoever disobeys his orders will, after investigation, be punished as an example to others.

“ The superintendent is particularly cautioned to see that the cuts in every Parganah are equally and justly distributed, and in this matter to consider every one on an equality; not to permit the strong to oppress the weak, and so to act as to please both God and man.

“ The inhabitants of both sides of the canal will abide by these orders, and obey all the high, enlightened, concise, &c. &c. farmans of the king.”

This document will be regarded as a very curious one by all who take interest in the past history, as well as in the present and prospective utility of the canals of Hindustan, suggesting as it does a fact which history appears to have forgotten, and which we have not ascertained

(*l*) Excepting a few of the different kinds of *Ficus*, scarcely any old trees now exist on the canal banks.

(*m*) *Shikkdár*, a revenue officer.

without some degree of pleasure, namely, that the Jumna canals, as a perennial source of supply to a thirsty land, owe their origin to the greatest of Indian princes.

The question, however, is a difficult one on account of the universal prevalence of the belief that Fíroz Sháh drew a canal *from the Jumna* to Hissár, and from the obscurity of the accounts of the various channels excavated by that king. The only books bearing on the subject to which I have access, are Dow's *Firishta*, and Rennel's *Memoir on the Map of India*.

The words of *Firishta* are as follows :—“ In the year 757, between the hills of Mendouli and Sirmoor, he (Fíroz) cut a channel from the Jumna, which he divided into seven streams; one of which he brought to Hansi, and from thence to Raeesen, where he built a strong castle, calling it by his own name. He drew, soon after, a canal from the Cagar, passing by the walls of Sirsutti, and joined it to the rivulet of Kera, upon which he built a city, named after him Fírozeabad. This city he watered by another canal from the Jumna.”(n)

The seven streams I cannot explain. “ Raeesen, (though this name is not now recognizable) where he built a strong castle, calling it by his own name,” is doubtless Hissar Fírozah, or “ the castle of Fíroz.” The remainder of the sentence seems almost inextricable from its obscurity, and probably, as Major Rennel suggests(o), contains a jumble, arising from the multitude of excavations made by King Fíroz, and the number of cities to which he gave his name. There appears, however, no reason to believe, according to Rennel's hypothesis, that a canal was ever brought to Delhi before the time of Sháh Jahán.

The *city of Sirsutti*, which Major Rennel is a little puzzled to fix, would seem to be *Sirsa*, for the following reasons—It was (Rennel

(n) Dow's *Firishta*, I. 305. A more exact translation than Dow's of the passages relating to the excavations of Fíroz, from a copy of *Firishta* in the palace library at Delhi, is given by Mr. Seton, Resident at Delhi, in a letter to Government, on the subject of restoring the canals, dated September 11th, 1807. But, in the words quoted, there is no material difference, except in the names of Hansi and Raeesen, which Dow writes *Hassi and Beraisen*. But the system of water carriage on the canals which Dow attributes to Fíroz in the following sentence, appears to be a mere embellishment.

(o) “ It may probably be a jumble of two sentences, which relate to different cities together. The *river Kera*, and *Fírozeabad* may relate to the city of Fírozepoor, at the conflux of the *Sutlege* and *Beyah*, and the canal from the *Jumna* to *Fírozeabad*, a city founded by Fíroz in the vicinity of old Delhi. * * * * Capt. Kirkpatrick notices an obscurity in the text of *Firishta* in this place.—*Rennel*, page 74.

p. 76) at the end of Timur's third march from Bhatner to Samána, and four marches distant from the latter place. Now *Sirsa* lies directly in the road from Bhatner to Samána; it is upwards of forty miles distant from the former and about eighty-five from the latter. This is easily reconcilable with the number of marches given, especially as two of these seven are stated to have amounted to 32 kos; which, if we take somewhat under 60 miles, the remaining five marches would average 14 miles each, and three such marches would just give the distance from Bhatner to Sirsa. Firishta also states that Timur having taken and pillaged the town of Battenize (Bhatner), and after that *Surusti*, advanced to Futtehabad(*p*). This seems to fix the identity of Sirsutti with Sirsa. But again, Ibn Batuta relates, that on his journey from Multán to Dehli, after travelling four days from Ajúdahan, he arrived at the city of Sirsutti, a large place abounding in rice, which was carried thence to Dehli. And from Sirsutti he proceeded to Hansi(*q*). Now Sirsa is about 100 miles distant from Ajodin, (or Pák Patan) on the Gharra, in the direct line towards Hansi. And the rich valley of the Ghagar might well supply the abundant rice crops.

The canal then which Fíroz drew from the Ghagar under the walls of Sirsutti, is in all probability the Choya nálá, which issues from the Ghagar near Múnak, passes close to Sirsa, and bears evident traces of having been partially, at least, an excavated channel(*r*). The mention of its junction with "the rivulet of Kera" is indeed unintelligible. The nálá in fact joins the Ghagar again, not far from Sirsa, and a short distance below their union, the Revenue map shows a village called Fírozabad. I should be curious to know if at this village exist any remains of greatness, from which we might suppose it to be the city alluded to by Firishta.

The remainder of the sentence we must leave alone. Hissár Fírozah might indeed have been watered by a canal from the Ghagar as well as from the Jumna(*s*), but certainly not by a canal from the Ghagar passing under the walls of Sirsutti or Sirsa.

(*p*) Dow II. p. 4.

(*q*) Ibn Batuta, p. 110.

(*r*) See Capt. Baker's printed report on the Ghagar.

(*s*) And probably was. For the late Major Brown traced an old channel from the vicinity of the Ghagar, in the direction of Hissár. This, however, the natives called an old bed of the Sirsutti river. But the Sirsutti has a gift of ubiquity!

Major Rennel's words with regard to the Hissár canals are as follows : " It appears that previous to the building of Hissár, Fíroz had made a canal from the Jumna, near the northern hills, to Safidún a royal hunting place ; for the purpose of supplying it with water. This canal was in length 30 royal cosses or full 60 G. miles ; and it passed by Karnál and Toghlukpoor. After the foundations of Hissár were laid, he drew two principal canals to it ; one of which was a prolongation of the canal of Safidún, the whole extent of which was then 80 (common) cosses, or about 114 G. miles. The other principal canal was drawn from the Sutlege river to Hissár Fírozabad. The outlet and course of this canal is not so clearly defined as the other : Capt. Kirkpatrick, to whom I am indebted for the information concerning Hissár and its canals, had it from a history of Fíroze written by *Shumse Seraje*, soon after the death of that great monarch which happened in 1388."

With regard to this Sutlege canal to Hissár Fírozah having ever been successfully executed, we may feel sceptical. The only line within possibility would be from the neighbourhood of Rugar to the Sirhind nála, and thence crossing the Ghagar into the Hissár district, according to the general line sketched by Capt. Baker in 1841. But leaving this and turning to the Safidún canal, we remark that in Hodgson and Herbert's map, a branch of the Chitang is represented as quitting the main channel and passing within a short distance of Safidún(*t*). And this, guided by the *Sanad* before us, we might suppose to be the original canal of Fíroz, were not the statement so distinct that his canal was drawn from the Jumna. Toghlukpúr I have no knowledge of, but the mention of Karnál points to the existing line of canal, as the Chitang is ten miles distant from that city. It is difficult to doubt this evidence, and yet it is almost equally difficult to throw overboard the clear statement of Akbar's *Sanad*. It is indeed possible that Fíroz may have connected the Chitang at a much higher point of its course with the Jumna, by a cut which could only convey a supply of water into the nála when the river was at high levels ; or that a canal from the Jumna was by Fíroz Sháh attempted unsuccessfully, upon which recourse was had to the

(*t*) " Of this branch all I am aware of is, that in seasons heavy of rain great floods pour into the canal near Barod, said to be consequent on the destruction of the earthen dams of the Chitang.—*Col. Colvin in J. A. S. II. 106.*

temporary supply derivable from the Chitang, and as the latter flows for sixty miles almost parallel to the Jumna and at no great distance from it, a misrepresentation thus arose. Otherwise we can only suppose that Akbar, in self-glorification, falsely represented his own renewal and repair of his predecessor's work, as an original enterprize of his own.

Singularly enough the *Sanad* itself does not speak of the new canal having been fed from the Jumna, but "from the nálás and streams at the foot of hills which are collected in the Sonb river and flow into the Jumna." But the Emperor speaks of his canal as capable of supplying water all the year round, and the Jumna is the only accessible source of such a supply. Doubtless then as now, the supply of water *crossed* the Sonb, that is, flowed *into* it and again *out* of it, so that the canal might with truth be said, to be drawn from nálás collected in the Sonb.

It is certainly somewhat singular that Firishta, who flourished in the latter part of Akbar's reign, and has made prominent mention of the ancient excavations of Fíroz, should not have alluded to this work. But the historian residing in the Deccan had probably no personal knowledge of the work, whilst contemporary documents would be less accessible than those relating to past times. It is true also that the Hansi canal is still known universally as the Canal of Fíroz, and the name fondly bestowed by Akbar in honour of his infant heir has been utterly forgotten(*u*). But new names always adhere loosely among the many: *Dehli* and *Agra* are likely to outlive the remembrance of *Sháhjáhánábád* and *Akbarábád*, and though the canals have had as many names as a Parisian *place* during the Revolution(*v*), yet Nahr Fírozah, the first name known to the people, keeps its place in their mouths.

There seems no good reason to doubt the genuineness of the Sanad. It is dated in the month of Shawál A. H. 978, from Fírozpúr in the Súbah of Lahaur. Now it appears from Firishta, that Akbar, on the

(*u*) Akbar appears to have been particularly fond of this kind of nomenclature. He called the new Súbah of Kandísh *Dándísh*, after his son Daniel.—(*Rennel.*)

(*v*) Some of these names are—

Nahr Fírozah.
Shaikh Nai.
Nahr Bihisht.
Fyz Nahr.
Sháh Nahr.

birth of his son Murád, in the first month of 978, went on a pilgrimage to the shrine of Muyínuddín at Ajmír, thence by way of Nagor and Ajodín on the Sutluj to Lahaur, which he quitted for Ajmír and Agra in the second month of 979. So that he might well have been at Fírozpúr on the date given.

It is easy to conceive how the canals fell into decay. In the decline of the imperial power, when the irrigated country was a seat of constant war, and the lands along the banks were alienated among various chiefs, any system of conservancy became impossible, and the works must rapidly have been ruined. The Hansi canal was the first to suffer, as early as 1707, we are told(*w*), the Sikhs taking advantage of the weakness of government during the contentions of Aurang Zeb's sons for the empire, converted the whole of the canal waters to their own use. And this at once reducing the country around Hissár to its original sterility, forced almost the whole of the inhabitants to seek a more favourable soil. A hundred years afterwards, in 1807 (as we are told by an officer on Survey in the Sikh States at that time), there was not a single inhabitant in the extensive city of Hissár(*x*). The Dehli canal, or Ali Mardán Khan's branch, continued to flow to a much later period. The officer just referred to learned, from aged zamindars, that the country had been deprived of the advantages of this canal since the accession of Alamgír II. in 1753. The same authority informed him that for purposes of canal police, and the ready repair of accidents, a Darogha was stationed at every three or four koss, with peons and beldárs under him. The water rent appears to have been regulated by the time that the outlets remained open. 1000 armed peons and 500 horse, as Mr. Seton was informed by the son of one of the last native superintendents(*y*) were maintained on the establishment. According to a proverbial expression current at Dehli, the net revenue from the canals was reckoned equal to the maintenance of 12,000 horse(*z*).

As Colonel Colvin's paper on the history of the canals contains few dates, it may be worth while to add the following :—

(*w*) Letter dated May 1807, from Lieut. F. White, Surveyor to the Resident at Dehli. In the Office of the G. G. A. N. W. F.

(*x*) Ditto ditto.

(*y*) Letter from Mr. Seton to Govt. 11th September, 1807.

(*z*) Ditto ditto.

Chronology of the Western Jumna Canals.

- A. D. 1351.—Fíroz Sháh brought a stream down the channel of the Chitang to Hansi and Hissár.
- About* 1468.—The waters of the above named channel ceased to flow further than the lands of Kythal.
- A. D. 1568.—Akbar re-excavated the work of Fíroz and brought a supply from the Jumna and Sonb, by the present line, into the Chitang.
- About* 1626.—From the last named line, Ali Mardán Khán drew a canal to Dehli; first by way of Goháná, and afterwards, on that failing, by the present channel, passing near Paniput and Soneput.
- A. D. 1707.—The water ceased to reach Hariána.
- „ 1740.—Ceased to flow at Safidún.
- „ 1753 }
to } The Dehli branch ceased to flow.
„ 1760 }
- „ 1817.—Capt. Blane appointed to restore the Dehli Canal.
- „ 1820.—The water again entered Dehli.
- „ 1823.—Restoration of Fíroz's, or the Hansi branch commenced.
- „ 1825.—The water turned down.
- Simla : November 1st, 1845.*

P. S.—Capt. Abbott having, since the above was written, furnished me with a copy of the original Persian of the Sanad, it is enclosed. I have also since ascertained that the Ayin Akberi makes no mention of Akbar's having engaged in this work, which is singular.

Notes, chiefly Geological, on the Western Coast of South India.

By Capt. NEWBOLD.

I have not yet had an opportunity of examining the Western Coast from Cape Comorin to Beypoor, but by specimens received thence, and by information from General Cullen, laterite is doubtless the prevalent surface rock. General Cullen writes me that he has found a bed of lignite, in the laterite at Karkully, about fifteen miles south of Quilon, in a stratum of dark shales and clays. At Cape Comorin itself are beds of sandstone, and shell limestone, of which a good account is a desideratum.

Calicut.—At Calicut, the ancient capital of the Zamorin, (a corruption by the Portuguese for Raja Samudri) and the landing place of Albuquerque on the shores of India, laterite is also the prevalent rock.

The modern town exhibits few traces of this once famous city. Of the old fort scarcely a vestige remains beyond a ruined doorway, the traces of a fosse and counterscarp, some mounds marking the southern gateway, and the site of a few bastions.

Another fort, it is said, was built by Tippoo; but this too has been destroyed; and the present shoal of Calicut was pointed out to me by an old native as the site of a still older fort overwhelmed by the sea. Tradition states that the place where the Syrians landed near Quilon is also engulfed.*

The modern town is a large assemblage of garden houses, on a low sandy sea coast, under a grove of cocoanut and jack trees, and extending a considerable distance inland. A broad street runs down to the sea through the midst of this scattered town. The houses flanking it are usually contiguous, built of laterite, or brick and chunam, whitewashed.

The streets, that branch off from it to the right and left, are narrow, winding, and dirty, like those in the oldest parts of Lisbon. Here dwell the Moplay and other native merchants.

On the beach facing the sea runs a row of warehouses for timber, coir rope, split bamboos and other marine stores. The rope is manufactured on the spot.

* Madras Journal, No. 30, p. 146.

In the roadstead I observed native craft only. The boats used for communication with the shore, though composed of planks sewn together with coir, like the Massoolah boats at Madras, differ from them in being lighter, lower, and flat-bottomed, and are extremely pointed at the stem and stern. As the surf here is much less powerful than on the Coromandel Coast, a boat of a heavier description is not required.

The laterite continues, by Mahé and Tellicherry, to Cannanore, a little north of which it overlies some carbonaceous looking clay, and slate clay. Lateritic iron ore is found at Augadipur, Satimangalum, and many other places throughout Malabar; iron sand (magnetic) in most of the ghaut streams. Gold dust is also found in similar localities, especially in Wynaad and Ernaad, and other places elsewhere specified.

Payengady.—Payengady is about sixteen miles NNW. from Cannanore, and stands on the sea coast near a back water. A *coup d'œil* from the rising ground near the village presents a low flat, stretching between an inland ridge and the sea; and which has all the appearance of having been covered by the sea up to the base of the laterite cliffs. This flat is for the most part covered by marine sand, and thinly scattered with houses shaded by cocoanuts. A few marine shells were found at the base of the cliffs about a mile inland. Whether drifted by the wind or conveyed here by the sea under former conditions is uncertain.

The hills in the back ground stretch out like promontories, terminating abruptly at the inland edge of the flat.

The laterite overlies granitic and hypogene rocks. Between Covai and Cautcutcherry the Nelisir back water is crossed from Malabar to Circar Canara, or from Malayala to Tuluva, where Canarese is spoken and Malayalum ceases.

Cassergode.—The laterite continues the surface rock by Hosdroog, Bekul, and Chundergherry, to Cassergode. It rests as usual on granitic and hypogene rocks; which, near Bekul, are veined with quartz, and imbed garnets and amethystine quartz, fragments of which are numerous in the sand on the shore. There is also a black magnetic iron sand derived probably from the dark and beautifully crystalline hornblende schists. The strike of strata is westerly: the dip is confused, often vertical. The fort stands on laterite, capping basaltic greenstone.

The soil on the rice flats is a rich mould, deposited in part by the rivers in their passage to the sea from the ghauts. These bring down a considerable portion of the decayed vegetable matter of the dense jungles on their banks, mingled with the detritus of granitic hypogene rocks, and of the laterite. When lateritic detritus is in excess, vegetable matter is added by the natives as a manure. Inland, to the NE., the granitic masses of Jumalabad, Murbiddry, and Carulla rise above the surface, the former to a great height, almost inaccessible from the steepness of its sides.

Mangalore.—Laterite is still the surface rock as before observed. The numerous back waters or marine lagoons, which lie along the Malabar Coast, are formed at the mouths of rivers by sand bars thrown up by the antagonizing forces of the mountain torrents and the tidal wave. These sand bars are liable to be broken through, and alter their position by the force of extraordinary storms. Their beds afford instructive examples of the manner in which both fresh water and marine exuviae may be mingled and embedded in the same stratum. Numerous sand dunes also occur at the embouchures of rivers near back waters. These tranquil marine lagoons greatly facilitate native commerce along the coast.

Kundapur.—About a mile inland from the present embouchure of the Kundapur river, stands the town of Barcelore, the supposed Barace of Ptolemy: a place of great traffic in former times with Arabia and Egypt, and which is supposed to have stood upon the old embouchure of the river before the land gained upon the sea.

Vicramaditya, or his dynasty, is said to have ruled 2,000 years at Barcoor (Barcelore), and, after him Salivahana, to whom succeeded Buddha Penta Raja and the Bijanugger dynasty. A human sacrifice, offered up to increase its commerce, is alluded to in the Mackenzie MSS.

I observed near the old Pagoda at Kundapur, an inscription on stone, which opportunity did not permit me to copy. Barcelore is still a place of great native trade.

The present bar at the river's mouth does not admit vessels of more than fifty or sixty corges, which find secure anchorage under the lee of the north bank. Its entrance was protected by a battery built by Hyder, and an old fort now in ruins.

Honawer (Onore) and Sedashegur.—The geology of Honawer, or Onore, has already been touched upon. Suffice it to say, that laterite is the prevalent rock.

Sedashegur is about $168\frac{1}{2}$ miles, northerly from Mangalore, about three miles south of the southern frontier of the Portuguese territory of Goa. The western ghauts here advance boldly to the ocean and afford some points of view, which truly approach the magnificent. The back ground of the picture is filled with the wild mountain scenery of the ghauts, from whose forests issues the Kali, or Black River, to the Indian Sea in the fore ground, expanding into a broad and beautiful lake near its embouchure, and stretching between two bold promontories, the northernmost of which is crowned by the picturesque ruins of the old fort which once guarded the entrance.

Across the mouth of the river runs a sand bar, over which at high water there is a draught of about two and three-quarter fathoms. Vessels of about forty corges find a snug anchorage within the bar; and boats of from twenty to twenty-five corges pass up the river eighteen miles to Mallapur, where there is a salt depôt. They carry up salt-fish and salt from Gokurn, and bring back rice and firewood, chiefly for the Goa and Bombay markets. Mr. Oakes attempted to make this a depôt for the cotton shipped from the interior to Bombay, &c., as being a much more convenient harbour, and nearer Bombay than that of Kompta. But the project failed in consequence of the opposition of the Gujerati merchants of Kompta, who were averse to quitting their Mamool village.

The formation of the ghauts near Sedashegur to the south, is chiefly granite with gneiss and hornblende schist, penetrated often by large dykes of basaltic greenstone, which at their base are covered partially by laterite. Their summits, I had no opportunity of examining.

A little south of Sedashegur, between Ancola and Chendaya, the beach of a small and pretty indentation of the sea is strewn with nodules of a stiff black clay, resembling in colour that of the lignite deposit at Beypoor: the situs cannot be very far distant. Iron is said to be smelted at Gopchatta.

The soil is usually a sandy loam. The staple articles of cultivation are rice, cocoanuts, sugarcane and raggi. The latter and hill-rice

occupy the dry lands and cleared sides of the mountains (like the wheat on the high *sierras* of Spain,) while the irrigated flats of the valleys smile with abundant crops of paddy and sugar-cane. Yearly the mountains blaze with the fires of the clearers, who are obliged, like the Malays, to shift from one spot to another as the soil of the clearing becomes exhausted.

The fort, it is said, was built by the Sodaj Rajas of Sircy, from whom the Portuguese wrested it. It next fell with Ancola and Gokurn into the hands of Hyder, and eventually into those of the English.

I observed about thirty-two guns, apparently of Portuguese manufacture, lying about.

At present (1840), Sedashegur (Siveswargur) contains about 600 houses, inhabited principally by Concanni Mahrattas engaged in cultivation, by Christians from Goa, Comarapaiks, and Mussulmans. Three miles north commences the *Konkana* region, where that of *Tuluva* terminates. Near the junction, the two languages, viz. Canarese and Mahratta, are mixed. The old inscriptions on stone at Gokurn and other places south of this, are mostly in the old Canarese language and character. Some of the earlier ones belonging to the ninth century of the Salivahana era, show that this part of the country was under the sway of the kings of the Cadumba dynasty of Bunwassi; and those of the fifteenth century show the extension of the Bijanuggur empire to the western coast.

Gokurn, about thirty miles south of Sedashegur, is one of the sacred places of Hindu pilgrimage, ranking with Tripati, Ramisseram, Juggernath, Sondur and Sri Sailam or Perwut.

It is the reputed scene of Parasuram's exploits, who raised the whole of the western coast from the ocean's bed to the base of the ghauts, and divided the new born territory among the Brahmans. Many subdivisions of this tract, and other changes, are known to have taken place at various historical epochs; for instance, the tract from Honawer to Gokurn was called *Haiga*; but it is probable the three provinces as they now exist, viz. the Concan, (or *Konkana*); Canara (or *Tuluva*); Malabar or Travancore (or *Kerala*), distinguished by the Mahratta, Canarese, and Malayalum languages, were the original geographical and political divisions of the western coast of India. After descending the ghauts,

with the physical aspect of the country, the vegetable, animal, and social systems undergo a striking change. A new language strikes the ear, and the eye is astonished at the sight of the wives and daughters of the upper classes, walking abroad naked from the waist upwards. The houses of towns and villages, instead of being huddled together as in the Carnatic, are widely separated in gardens or *desams* like the Malay Campong, and the generality of inhabitants struck me as resembling Malays in their habits and customs. The singular right of inheritance enjoyed by the sister's son is precisely similar to that of the Menangcabowe Malays. Sheep are no longer seen, and instead of the fine oxen of Coimbatore, one sees a miserable breed of black cattle, hardly larger than donkeys. The peculiar manners and customs of the various castes are too various for detail here.

Goa and Malwan.—Laterite covering granite and the hypogene rocks, continues from Sedashegur to Goa, and probably from Goa by Vingorla to the north of Malwan.

At Malwan gneiss occurs, and a bright magnetic iron ore, resembling that of Salem, disseminated in grains and nests, or in alternate layers with quartz. The rocks off the coast, washed by the breakers from their white colour and shape have the appearance of a boat under sail.

Mr. Fraser describes the overlying trap as coming down to Malwan, but I did not meet with it on the coast till I reached the village of Sarki.

Sarki.—I had no opportunity of examining the rocks at Ratnagherry, which lies between Malwan and Sarki: but the contour of the ghauts here is apparently trappean. At Sarki the trap hills descend towards the coast in long, flat-topped, wall-like promontories, becoming higher and wilder around Severndroog.

Bancoot or Fort Victoria.—The trap rises from the sea beach in a high steep rock, on the western extremity of which stands the fort commanding the entrance of the river. The citadel and flag-staff are conspicuous objects at sea. The town extends, at the base of the rock, towards the sea, and is well studded by cocoanut trees.

The rocks in the little bay of Shiwurdin are dark basalt and amygdaloid, imbedding zeolites, geodes and veins of chalcedony and quartz. At the water's edge the basalt is much honeycombed.

The outline of the ghauts in the back ground is bold and picturesque. A little to the north, the mountains of overlying trap attain their maximum elevation, which never approaches that of the peaks of granite and hypogene schist farther south, although they sometimes attain 4,500 feet of altitude above the sea's level.

They usually rise from the low maritime tracts of the Concan in bold escarpments, broken by steps or terraces, to the table land of the Deccan.

The Concan.—The foregoing observations from Goa were made as I was sailing up the coast from Sedashegur in a native pattamar, with a foul wind to Bombay. After leaving Fort Victoria the wind became fair, and consequently I had no longer any opportunity of going ashore and examining the Concan between Bombay and Bancock. The ghauts in this region, we know, are of trap from the observations of Colonel Sykes. Their long horizontal outline, varied occasionally by truncated conoidal peaks, are characters in which their nature is plainly written.

The rock composing the Concan is chiefly trap. My lamented friend Malcolmson found beds of sandstone at Atchera, dipping at a considerable angle to the NW.

As the existence of fossiliferous deposits is by no means improbable on this low maritime tract, through the rocky fissures of which many hot springs find vent, and which have not yet been fully examined, I should strongly recommend its minute geological exploration.

Bombay.—The geology of this and the neighbouring beautiful islets of Elephanta, Salsette, &c. has been so well and minutely described by Dr. Thomson, that I shall content myself with observing that they are all of the overlying trap formation, and the rocks composing them embrace every variety from dark basalt to light coloured amygdaloids and wackes, from compact to crystalline and porphyritic.

I must not however omit to mention a curious variety termed *white basalt*, of which the base of Sir John Malcolm's statue at Bombay, if I recollect right, is composed. Externally it often resembles a soft felspathic granular sandstone, white, with a slight shade of yellow, but it is clearly seen passing into a true, rough, crystalline trachyte.

It is dug at the quarries of Salsette, and composes a large part of the island; some of the granular varieties are extremely hard, and

take a fine polish. Crystals of glassy felspar occur imbedded when the rock passes into trachyte porphyry; but I have never seen it with scales of mica, assimilating granite, like the trachytes of Smyrna and Mitylene. In some places it has the appearance of a stratified sandstone, and in others there can be no doubt of its volcanic origin. In one place it is felspathic; in the other imbedding rock crystal, and *globules* of quartz.

As this curious rock is without parallel in India, a detailed description of its relations with the contiguous trap, and a series of specimens exhibiting the different mineral alterations the rock undergoes in various parts of its mass from the line of contact to its most distant point from the trap, would be highly interesting and instructive. It is probable that the molten mass of trap and trachyte may have here invaded the sandy bed of a lake or sea, and thus become blended.

The amygdaloid of Bombay, among other beautiful specimens of the zeolite family, contains that rather rare mineral (in Europe), apophyllite. Chalcedony in most of its varieties, and beautiful agates, are common.

The temperature of sea water in the harbour of Bombay in April was 87° Fahr. a foot below the surface. The temperature of air in the shade was 85° the time of observation 3 P. M.

The temperature of water in a well at Bombay, 20 feet deep, was 82° ; (which approaches the mean temperature of the place): the temperature of air in the shade was 86° ; time, noon; month, April. The temperature of the cave of Elephanta—same month—time, noon—was 85° ; the temperature of the water of a well in Elephanta was 75° . 5'—temperature of air in the shade at the moment was 85° ; time of observation, noon.

*The Coins of Arakan :—The Historical Coins, by Capt. A. P. PHAYRE,
Principal Asst. Commr. Arakan.*

The art of coining appears to have been introduced among the Arakanese only at a very late period. Their oldest legendary coins were suggested to them by the coined money of the Mahumudan sovereigns of Bengal. I say their *legendary* coins, since it is probable that a medal similar to that described, and so happily explained by Lieut. Latter (in the Jour. As. Soc. Vol. XIII. p. 571) was struck in Arakan at a period much earlier than were the coins now to be noticed. It is indeed certain, that to coin money is a but lately known art among the Burmese race. The term in their language for coin,—*ding-ga*,—seems not to be a native word, but adopted from the Hindooee, *tu-ka*. In the dominions of Ava, coined money is still unknown; payments are made by silver ingots weighed out as required.

The Arakanese sovereigns no doubt wished to follow the kingly practice existing in Bengal, of coins being struck in the name of the reigning monarch. We learn from their annals that about the middle of the fifteenth century of the Christian era, they conquered Bengal as far as Chittagong, of which they kept possession for about a century. It was then, that they first struck legendary coins. On the obverse of the earliest of these, we find the date and the king's names written in the Burmese character, together with barbarous attempts at Mahumudan names and titles; these they assumed as being successors of Mussulman kings, or as being anxious to imitate the prevailing fashion of India. Indeed, there is some reason to believe that *Ba-tsau-phyú*, a Búddhist king like the rest, who ascended the throne A. D. 1459, obtained among his own subjects the epithet *kalamashá*, (the son of the *Kalama*) from having issued a coin with the Mahumudan *kulima* inscribed upon it. The reverse of most of the earlier coins, contains unintelligible Persian and Nagri inscriptions. The Arakanese kings were frequently known to their subjects by names and titles different from those which appear on their coins. This circumstance will explain a discrepancy observable between the coin-names of kings given here, and the sovereigns of the same period found in the list of Arakanese kings, published in the Society's Jour. Vol. XIII. page 50. The coin-date generally coincides with the year of the king's

accession to the throne ; but in some instances it does not : more than one coinage having occasionally been issued in the same reign.

Old coins are frequently discovered buried in the ground in various parts of Arakan. Several valuable ones thus found have been kindly sent me by Major David Williams, Principal Assistant Commissioner (then) of Ramree. Many have also been met with, hung as charms or ornaments round children's necks, which have been retained in families for several generations. At present I have the means of describing only a few of those I once possessed ; the greater portion having been lost when the Society's cabinet was robbed some months ago. All those now described are of silver, for though a few of mixed metal are to be met with, their legends do not differ from these.

The oldest Arakanese coin I now possess is that marked No. 1. The obverse is as follows :—

၉၆၃ ဆင်ဖြူ သခင် နရဝိဗ္ဗတိဆောလိပ်သျှာ

TRANSLATION.

963. *Lord of the White Elephant, Nará-dib-ba-di Tshau-lim Shyá.*

Here 963 in the Arakanese era is equivalent to A. D. 1601. *Nará-dib-ba-di* is a Pali title signifying I believe “ Ruler of men ;” while *Tshaulim Shyá*, is nothing more than a barbarous attempt at the Mahumudan title *Zalim Shah* ! The reverse of this coin bears some unintelligible compound of Persian and Nagri letters. The above king stands No. 17 in the list of Arakanese sovereigns of the *Myouk-ú* dynasty, in the Jour. As. Soc. 1844, p. 50, under the name of *Meng-Rá-dzá-gyi*. I long considered the date of this coin to be 863, the first figure on that I possess being imperfect, and the date 863 corresponding with the accession of a king styled *Meng Rá-dzá* in the above mentioned list No. 8. However, on seeing a duplicate of this coin in the possession of Lieutenant Fytche, I was struck with the resemblance of the first figure to a 9 and looking into the *Rá-dzá-weng* or Arakanese history, I found *Meng-Rá-dzá-gyi* mentioned with the Pali and Mahumudan titles (the latter differing slightly in the spelling) as inscribed on the coin. The coin must have been struck in the eighth year of his reign.

No. 2. The next coin is that of the son and successor of the preceding king; the obverse bears the following date and inscription:—

၉၇၄ ဆင်ဖြူ သခင် ဝရမ္မရာဇာ ဥဒ္ဓျာင်ဒျာ

TRANSLATION.

974. *Lord of the White Elephant, Wa-ra-dham-ma Rá-dzá Oo-shyoung-shya.*

This date is equivalent to A. D. 1612. *Wa-ra-dham-ma Rá-dzá* is a Pali title said to signify “Excellent-law-observing king;” while in *Oo-shyoung-shya* we have another instance of the barbarous adoption of a Mahumudan name, it appearing to stand for Hoosein Shah! This king was commonly known to his subjects by the name *Meng khamoung*.* The reverse of this coin bears like the preceding one an illegible inscription in Persian and Nagree.

No. 3. The obverse of this coin has the following date and inscription:—

၉၈၄ ဆင်ဖြူ သခင် ဆင်နီ သခင် သိရိသုဓမ္မရာဇာ

TRANSLATION.

984. *Lord of the White Elephant, Lord of the Red Elephant, Thi-ri-thu-dham-ma Rá-dzá.*

This date is equivalent to A. D. 1622. There is no Mahumudan name on this coin. The Pali title is translated “Excellent righteous king.” On the reverse is an illegible Persian and Nagree inscription.

No. 4. This coin, and all those posterior to it, have the same inscription on the obverse and reverse. On this one the date and inscription are as follows:—

၁၀၀၀ ဆင်ဖြူ သခင် ဆင်နီ သခင် နုရပတိကြီ

TRANSLATION.

1000. *Lord of the White Elephant, Lord of the Red Elephant, Na-ra-ba-di-gyi.*

This date answers to A. D. 1638, the very year in which the History of Bengal informs us that the “Mugh Chief who held Chittagong on the

* *Khamoung*, in Burmese writings signifies, the “canopy of state”—being part of the regalia of their Kings. It is probable that this title *Meng Khamoung*—was a translation of some Mahumudan epithet, which this King took to himself. It may be rendered, “The Canopy of Kings.”—T. L.

part of the Raja of Arakan," delivered it up to the Mogul Viceroy, Islam Khan. This circumstance accounts for the Persian inscription being wanting on this coin. This chief is called in the Bengalee History, Makut Ray, a corruption of his title *Meng-ré*, i. e. "War Chief."

No. 5. The date and inscription of this coin are as follows :—

၁၀၀၇ ဆင်နီ သခင် ဆင်ဖြူ သခင် သဝိုဏ် မင်းတရား

TRANSLATION.

1007. *Lord of the Red Elephant, Lord of the White Elephant Tha-dó the monarch.**

This king does not appear to have been known by any other name than that here mentioned. The date is equivalent to A. D. 1645.

No. 6. Date and inscription are thus :—

၁၀၁၄ ရွှေနိန် သခင် စန္ဒသုဓမ္မရာဇာ

TRANSLATION.

1014. *Lord of the golden Palace, Tsan-da Thoo-dham-ma Rá-dzá.*

The date answers to A. D. 1652. The style of the king is here altered; he is no longer Lord of the White Elephant, but of the "golden Palace." This style was retained until the fall of the kingdom in A. D. 1784. The Pali title signifies "The moon-like righteous king."

No. 7. The obverse and reverse run thus :—

၁၀၄၇ ရွှေနိန် သခင် ဝရဓမ္မရာဇာ

TRANSLATION.

1047. *Lord of the golden Palace, Wa-ra-dham-ma Rá-dzá.*

This date is equivalent to A. D. 1685. In the list of Arakanese kings before referred to, the date of this monarch's accession is erroneously given as 1054.

No. 8. The date and inscription are as follows :—

၁၀၇၂ ရွှေနိန် သခင် စန္ဒဝိဇယာ

TRANSLATION.

1072. *Lord of the golden Palace, Tsan-da Wi-dza-yá.*

This date answers to A. D. 1710.

* The words *meng tará* might perhaps be interpreted "Lord of justice." Whilst *dhamma* generally refers in the Burmese Language to the "sacred law," *tará* alludes to the "law of the land."—T. L.

No. 9. Date and inscription.

၁၀၉၃ ရွှေနန်း သခင် စန္ဒသူရိယံရာဇာ

TRANSLATION.

1093. *Lord of the golden Palace, Tsan-da Thu-ri-ya Rá-dzá.*
This date answers to A. D. 1731.

No. 10. Date and inscription.

၁၀၉၉ ရွှေနန်း သခင် မဒရိဇရာဇာ

TRANSLATION.

1099. *Lord of the golden Palace, Ma-da-rit Rá-dzá.*

No. 11. Date and inscription.

၁၁၀၄ ရွှေနန်း သခင် နရအာယံရာဇာ

TRANSLATION.

1104. *Lord of the golden Palace, Na-ra-a-pa-ya Rá-dzá.*

No. 12. Date and inscription.

၁၁၂၃ ရွှေနန်း သခင် စန္ဒပရမရာဇာ

TRANSLATION.

1123. *Lord of the golden Palace, Tsan-da Pa-ra-ma Rá-dzá.*

No. 13. Date and inscription.

၁၁၂၆ ရွှေနန်း သခင် အာယံမဟာရာဇာ

TRANSLATION.

1126. *Lord of the golden Palace, A-pa-ya Ma-há Rá-dzá.*

No. 14. Date and inscription.

၁၁၃၅ ရွှေနန်း သခင် စန္ဒသူမနရာဇာ

TRANSLATION.

1135. *Lord of the golden Palace, Tsan-da Thu-ma-na Rá-dzá.*
For this coin I am indebted to the kindness of Lieutenant A. Fytche,
Junior Assistant to the Commissioner of Arakan.

No. 15. Date and inscription.

၁၁၃၉ ရွှေရန် သခင် စန္ဒဝဒိသရာဇာ

TRANSLATION.

1139. *Lord of the golden Palace, Tsan-da-ihá-di-tha Rá-dzá.*

No. 16. Date and inscription.

၁၁၄၀ ရွှေပြည် သခင် ဓမ္မရာဇ်ရာဇာ

TRANSLATION.

1140. *Lord of the golden Land, Dham-ma-rit Rá-dzá.*

No. 17. Date and inscription.

၁၁၄၄ ရွှေရန် သခင် မဟာသမတရာဇာ

TRANSLATION.

1144. *Lord of the golden Palace, Ma-há Tha-ma-da Rá-dzá.*

This was the last native sovereign of Arakan. In the second year of his reign being 1146 or A. D. 1784, the Burmese conquered the country. They immediately issued the next coin.

No. 18. Date and inscription.

၁၁၄၆ အမရပူရ ဆင်ဖြူများရှင်နိုင်ငံ

TRANSLATION.

1146. *Conquered country of the Amarapura, many-white-Elephant-Lord.*

This coin was also placed at my disposal by Lieutenant A. Fytche. During the forty years the Burmese held Arakan, they did not, I believe, issue a coin with any other date stamp upon it.

There is another coin which has been lent to me by Lieutenant Latter, and which should have come immediately after No. 9. I now mark it.

No. 19. Date and inscription.

၁၀၉၇ ရွှေရန် သခင် နရပဝရရာဇာ

TRANSLATION.

1097. *Lord of the golden Palace, Na-ra-pa-wa-ra Rá-dzá.*

The date is equivalent to A. D. 1735.

The Coins of Arakan—The Symbolical Coins. By Lieut. THOS. LATTEK.

The coins of which the accompanying facsimiles are given, are interesting, in that they represent whatever ideas they were intended to convey, by means of pure symbolism alone; and afford no clue by which to connect them with any particular prince. They are all, I believe, of a type peculiar to Trans-Gangetic India. No. 1, was found in the city of Haleng, in the Empire of Burmah, and has been already described at some length in a former number of the Society's Journal. It is placed here for the purpose of shewing how the same type of symbol runs through the whole. The remainder are peculiar to Arakan, the last being somewhat common. Knowing these coins to be Buddhistical from their being found only in localities—where no other than that faith has obtained, and having, as I have already said, no clue to justify our connecting them with any particular monarch; it is only by viewing them as representing by means of symbols certain dogmas, or tenets, (whether religious, or philosophical) of the Buddhist faith, that we can hope in any way to resolve their meaning.

In the description of No. 1, I speculated that the side (*b*) might be intended to convey a symbolical representation of the cosmology of Buddhism. The twenty-eight circular figures in the outer ring representing the twenty-eight Buddhs characteristic of a *Mahāgabbha*, or grand period of nature; and the five drop-shaped figures within the circle representing a *Buddhagabbha*, or lesser period of nature, the present period being characterized by the presence of five Buddhs; which are therefore made to preside over a curious emblem composed of certain triangles representing this world in particular. Although I could not at the time account for the reason why this singular combination should be able to convey such an idea; yet in a subsequent paper, (on the Buddhism of the emblems of architecture), I ventured to suppose (taking the triangles with their points downwards to represent "water;" and those with their apices upwards to typify "fire;" that their being made to meet in a circle, (the universe) with a point in it, (this earth) meant to convey the belief in the reiterated destruction of the world by fire and water, whence its Pali name *lauga*, from *lau*, "to be again and again" renovated and destroyed. It is singular that in the two coins, Nos. 2 and 3, my interpretation is indirectly corroborated, for in them

this emblem of "renovation and destruction," is conformably represented by the Bull *Nandi*, the peculiar cognizance of Shiva, the God of "destruction and renovation."

The two last coins are Shivite, but probably appertain to a time when the emblems of the worship of Shiva, and those of Buddhism had something in common. Struck perhaps by this similarity as well as by their novelty, they seem to have been adopted by some of the Princes of Arakan. The fact of the characters on them being Pali does not in any way militate against this supposition, as the Burman Alphabet is but a modification of the Pali, and the similarity of the two increases in proportion to the earliness of the date. We see on these coins the Buddhist triglyph represented by the trident of Shiva. On each side is a scroll; and beneath are certain round dots. These dots are curious, for they here occupy the same position in reference to the triglyph of Shiva, that the guttæ do to the triglyph of architecture. In three coins in my own possession, evidently of two different dies, their number is "five." In another from the collection of Capt. Phayre, figured No. 3, their number is "nine;" this last, however, is a peculiarly expressive and powerful number in Buddhism. The legend over the Bull varies in three coins, they are given separately, (*a. b. c.* No. 5.). (*c*) presents the characteristics of the old Pali alphabet, with the exception of the first letter; I read it "*Shrī Vrieghau*, the last member of the symbol of the last vowel being effaced; so that it appears to the eye *Vrieghé*. The other two may be determined by those better versed in the old Nagri character. (*b*) is of a more ancient type than (*a*); which last is of the same class as the characters composing the inscription on the temple of Shiva in the village of Harshi, described in the Society's Journal, No. 43, July, 1835.

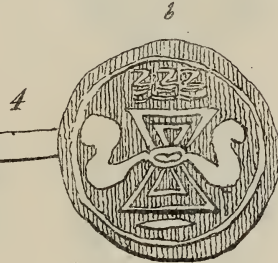
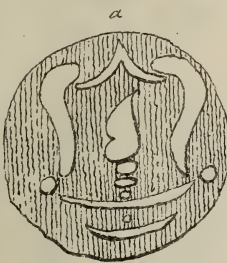
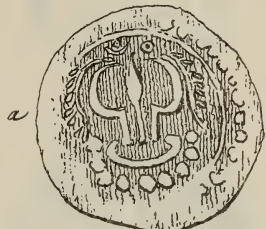
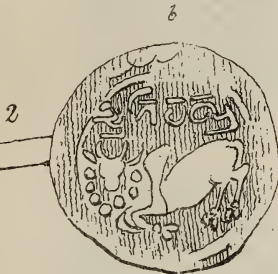
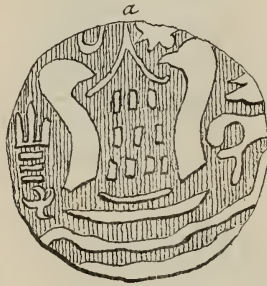
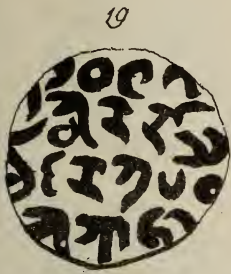
The popular tradition connected with these coins is the following: There was a king who set off to China to find the skull which he owned in a former state of existence when he was in the body of a dog; his astrologers having told him that this skull being wedged into the cleft of a tree was the reason why he was troubled with such incurable headaches, and that on removing it he would be cured. On his departure he left with his wife a ring, and told her that in case he should not come back in seven years, she was to raise to the throne, and marry

that one of her subjects whom it would fit. On his way back the daughter of the Ocean king who was in love with him, begged her father to raise a storm to drown his fleet, and thus procure her lover. This being done, the prime minister who escaped informed the queen of the death of her husband; she immediately gave out throughout her kingdom that he should be her husband whom this ring would fit. Though numbers tried, it was not till an herdsman from the hills with his brother and nephew came down, that it was found to fit any one. It fitted them all three, the queen married the eldest brother, who thus became king, and he, in commemoration of his origin, put an ox upon his coins, as also the goad (the trident), the implement of his craft.

The coin No. 4, is much more modern in appearance than any of the others. It would be impossible to determine its age, its appearance would not give it more than 100 years. It is evidently the handywork of an artist who has concocted together a quantity of symbols that most struck his fancy from coins of a more ancient date. On the side (*a*) we see the parasol roof; being a part of the *tsédya* emblems. On each side are figures appearing to guard it. Below is that flame-shaped symbol, mistaken by Marsden, if I remember right, for the conch of Vishnu. On the obverse (*b*) is the symbol of combined triangles, over which are three "Z" shaped figures.

No. 6. The coin No. 6, though not belonging to the country, is represented here, having been found on the sea shore of the Island of Ramree with several others. It is of gold, and thin. The central portion represents an animal like a pig, with the representation of the Bo-tree above, and a monographic character γ beneath. Around are certain characters which an intelligent Buddhist priest declares to be old Cingalese, and to compose the words, "*Pawaraganran thooradza*," commencing from the letter marked (*a*). The first letter appears to have been mistaken by him; the first half composing it, being indistinct, appears to have escaped his attention. The name he gives is that of one of the old kings of Ceylon.

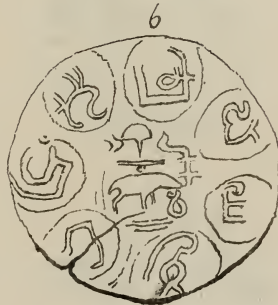
Symbolical Coins of Arakan.



ဇနာတဏှ
a

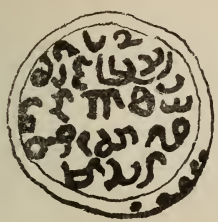
ဗုဒ္ဓါတဏှ
b

ဗုဒ္ဓါတဏှ
c



Historical Coins of Arakan.

1



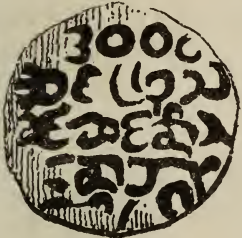
2



3



4



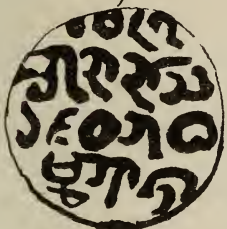
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6



7



8



9



10



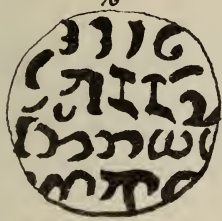
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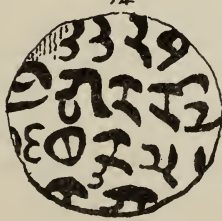
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13



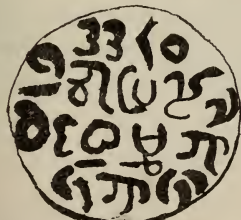
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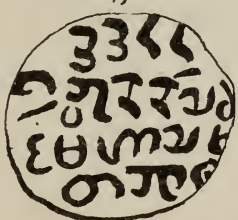
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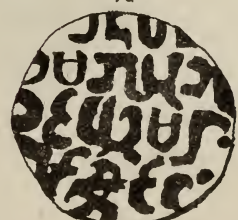
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J.W. Laidlay lith.

JOURNAL
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ASIATIC SOCIETY.

CATALOGUE OF MAMMALIA

Inhabiting the MALAYAN PENINSULA AND ISLANDS,

*Collected or observed by THEODORE CANTOR, M. D.,
Bengal Medical Service.*

☞ Localities printed in Italics signify those from whence the animals of the Catalogue were obtained : localities in ordinary type those previously given by authors.

[Continued from p. 203.]

GEN.—HERPESTES, *Illiger.*

HERPESTES JAVANICUS, *Desmarest.*

SYN.—*Ichneumon javanicus*, *Geoffroy.*

Mangusta javanica, *Horsfield.*

“*Garangan*,” *Horsfield.*

HAB.—*Pinang, Malayan Peninsula.*

Java.

The species is numerous. The largest male measured from the apex of the nose to the root of the tail one foot four and a half inches ; the tail one foot one and a half inch.

HERPESTES AUROPUNCTATUS, Hodgson.

SYN.—*Mangusta auropunctata*, Hodgson.

Herpestes nepalensis, Gray.

Herpestes Edwardsii, apud Ogilby (?)

Herpestes javanica, Hodgson, apud Gray : List.

HAB.—*Malayan Peninsula*.

Bengal, Nipal, Scinde, Afghanistan.

This species somewhat resembles *H. javanicus*, but the ground colour is lighter, and the lower surface uniformly pale yellowish-grey; whereas in the former species it is similar to the back, or a shade paler. A single female observed, measured from the apex of the nose to the root of the tail one foot one inch; the tail nine inches.

HERPESTES GRISEUS, Desmarest.

SYN.—*Ichneumon griseus*, Geoffroy.

Mangouste de Malacca, F. Cuvier,

Mangusta malaccensis, Fischer,

Mangusta grisea, Fischer,

Herpestes Edwardsii, Fischer,

Mangusta Nyula, Hodgson,

} Apud Schinz.

Herpestes griseus, Nyool, apud Ogilby.

Herpestes pallidus, Schinz.

Forsan *H. nipalensis*, Gray, Var. apud Schinz.

HAB.—*Malayan Peninsula*.

Bengal, Hindoostan, Scinde, Nipal.

The present differs from the other species not only by its grey colour, but by its broader head, particularly between the prominent eyes, and by its shorter, blunter nose, which places the eyes comparatively nearer to the muzzle. In a single female, measuring from the apex of the nose to the root of the tail one foot two and a half inches, the tail nine and a half inches; the intestinal canal was of the following dimensions :

Small Intestines,	..	..	..	3 feet 1½ inch.
Large ditto,	..	..	..	0 ,, 5½ ,,
Cæcum,...	..	..	..	0 ,, 1 ,,

By a contraction in the middle of the greater curvature, the stomach is distinctly separated into a cardiac and pyloric cavity.

HERPESTES BRACHYURUS, Gray.

SYN.—“Musang Túrón” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

The largest male measured from the apex of the nose to the root of the tail one foot six and a half inches, the tail nine inches. It is distinguished from the other species, not only by its colours and comparatively short tail, but by its larger size and much more robust make.

GEN.—FELIS, Linné.

FELIS TIGRIS, Linné.

SYN.—Tigris regalis, Gray : List.

“Harímau” or “Rímau” of the Malays.

HAB.—*Malayan Peninsula*.

India.

Lieut. Colonel James Low has communicated the following denominations, by which the Malays of the Peninsula distinguish different varieties :

“Rímau Sípai,” reddish coated, striped.

“Rímau Bállu,” darker coloured.

“Daun Pínang,” reddish coated, without stripes.

“Tuppu Kassau,” darkish, without stripes, but with longer hairs than the others.

“Puntong Prun,” very dark, striped.

FELIS LEOPARDUS, Schreber.

SYN.—Felis Pardus, Linné, ?

Felis varia, Schreber,

Felis Panthera, Erxleben,

Felis chalybeata, Hermann,

Felis antiquorum, Fischer,

Felis fusca, Meyer,

Felis Nimr, Ehrenberg,

Leopardus varius, Gray : List.

Felis Leopardus, apud Schinz.

“Rímau Bítang” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

India.

} Apud Gray : List.

DARK VAR.

SYN.—*Felis melas*, Péron, apud Gray : List.

“Rimau Kúmbang,”* of the Malays of the Peninsula.

The ground colour is a shining beetle-brown, mixed with white hairs, not however sufficiently to impart a grey appearance. The black spots become distinctly visible in certain lights only. The skin of a male killed at Malacca, measured from the nose to the root of the tail four feet four and a half inches, the tail two feet ten and a half inches.

The Leopards of the Malayan Peninsula appear to attain to a larger size, and to be more ferocious than is generally the case in India. Instances of their having killed and carried off Malays are on record.

FELIS MARMORATA, Martin.

SYN.—*Felis Diardii*, Fischer, apud Schinz.

Felis Diardii, apud Jardine. Tab. 21 and 22.

Leopardus marmoratus, Gray : List.

“Rímau dáhan” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

The ground colour varies from rusty-grey, or fulvous to grey, and the black markings are scarcely quite alike in any two individuals, nor is the extremity of the tail constantly black. The adult exceeds the size given in the original description ; a female measured from the apex of the nose to the root of the tail two feet half an inch ; the tail one foot nine inches. The species is numerous.

FELIS JAVANENSIS, Desmarest.

SYN.—*Felis javanensis*, Desmarest, apud Horsfield.

“Kuwuk,” Horsfield.

<i>Felis minuta</i> , Temminck,	} Apud Schinz.
<i>Felis servalin</i> , Temminck,	
<i>Felis sumatrana</i> , Horsfield,	
<i>Felis undata</i> , Desmarest,	

* “Kúmbang” signifies a beetle ; applied *par excellence* to a species of *Oryctes*, resembling *Scarabeus nasicornis*, Linné, which is very destructive to cocoon plantations. “Rímau Kúmbang,” Raffles, is by Schinz referred to *Felis Pardus*, Temminck, Var. *nigra*, Muller ; *Felis melas*, F. Cuvier, the habitat of which is said to be Java and Sumatra.

Felis Diardii, Griffith,
 Leopardus javanensis, } Apud Gray : List.
 "Rímau ákar" of the Malays of the Peninsula.

HAB.—*Pinang, Malayan Peninsula.*

Java, Sumatra ?

The ground colour in the Malayan individuals varies from pure grey to greyish brown or ferruginous. The largest adult male measured from the apex of the nose to the root of the tail one foot eleven and a half inches, the tail ten inches ; another of equal dimensions of the body had the tail eight inches in length. The intestinal canal was of the following dimensions :

Small Intestines,	..	..	..	3 feet 8 inches.
Large,	..	..	..	0 ,, 9½ ,,
Cæcum,	..	..	..	0 ,, 1½ ,,

In the scansorial habits of this very numerous species originates its local denomination "ákar," signifying a climber as well as a root.

FELIS PLANICEPS, Vigors and Horsfield.

SYN.—*Chaus* (?) *planiceps*, Gray : List.

"Kúching-útan," or "jálang" of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Sumatra, Borneo.

The Malayan individuals of this apparently not numerous species differ from the Sumatran, originally described, in having the whitish throat, chest and abdomen, and the inner side of the limbs undulated with brown, transversal, interrupted bands. In none of the Malayan wild cats is the length of the tail more variable. In a male, measuring from the apex of the nose to the root of the tail two feet one and a half inch, the tail, consisting of twelve gradually diminishing caudal vertebræ, measured five and a half inches ; in another, one foot ten and three-fourth inch in length from the nose to the root of the tail, the latter organ measured two inches, consisting of four slightly decreasing vertebræ, the last one of which was broad, flattened, and rounded at the posterior extremity. It is of most ferocious habits, and untameable. In the smaller individual the intestinal canal was of the following dimensions :

Small Intestines,	..	..	3 feet 6½ inches.
Large,	..	..	0 ,, 5½ ,,
Cæcum,	..	..	0 ,, 0⅝ ,,

FELIS DOMESTICA, Auct.

“Kúching” of the Malays.

The Malays, like most Muhamedans, are as partial to cats as they are the reverse to dogs. As observed by Sir S. Raffles, some of the Malayan, like the Madagascar domesticated cats, have a short twisted or knobbed tail, others are tailless. Among those of an uniform colour, a light ashy and a bluish (or slaty-grey) variety, with single longer black hairs on the back and tail, are conspicuous. They frequently relapse from a state of domestication, resort to the jungle, and shun the presence of man.

RODENTIA.

SCIURIDÆ,

GEN.—SCIURUS, *Linné.*

SCIURUS BICOLOR, Sparrmann.

SYN.—Das javanische Eichhorn, Schreb.* apud Horsf.

Sciurus giganteus, McClelland MSS.	} Apud Horsfield, Proc.
Sciurus bicolor, Sparrmann,		} Zool. Soc.
Sciurus madagascariensis,	} Apud Gray : List.
Sciurus macruroides, Hodgson,	

“Chingkráwah étam” of the Malays of the Peninsula.

HAB.—*Pinang, Malayan Peninsula.*

Java, Sumatra, Borneo, Siam, Tenasserim, Assam, Nipal.

The original diagnosis will prevent misunderstanding as to the species under consideration. “*Sciurus supra niger, infra fulvus, auriculis acutis imberbibus, palmarum ungue pollicari magno rotundato.*” (Sparrmann, apud Horsfield.) The colour of the head, back, tail, outside of the extremities, and the feet, is intense shining black, the single hairs being blackish-grey at the root, those of the tail blackish-brown at the root. In some individuals the black hairs generally, in others those of the tail, or some part of the back only, have a broad subterminal band of bright cinnamon, or Indian red, which imparts a reddish tint to the general black colour. The mustachios, whiskers and the superciliary bristles are black; those of the throat and forearm are black in some,

* *Sciurus javensis*, Schreber, and *bicolor*, Sparrmann, apud Gray : List, is *Sciurus Leschenaultii*, Desmar. apud Horsfield. Syn. *S. hypoleucus*, Horsfield.

ferruginous, or with the apex of that colour, in others. The under-parts vary from a deep golden fulvous to isabella colour. Whatever be the prevailing shade, it is always most distinct on the lateral line, which, commencing from the cheeks, passes along the sides of the body. The fur of the lower parts of the body, and of the inside of the extremities, is much shorter, softer, and less dense, than that of the back. The single hairs are greyish, or blackish at the root, with the apex of the shade of yellow prevailing in the individual. Single long bristles, either uniformly, or partially black, or fulvous, appear on the chest and abdomen. The species, under the present garb, is very numerous in the Malayan forests and hills.

VAR. β , Horsfield.

“*Sciurus supra fuscus, varians a fusco-nigricante ad sordide fulvum, pilis velleris fulvis et canescentibus intermixtis, subtus fulvus vel pallide flavescens.*”—Horsfield.

SYN.—*Sciurus auriventer*, Is. Geoff. apud Schinz.

Sciurus aureiventer, Is. Geoff. apud Gray : List.

“Chingkráwah” or “Chingkráwah puteh” of the Malays of the Peninsula.

Single individuals, resembling the Javanese one figured in ‘*Zoological Researches in Java*,’ occur at Pinang, but there, as in Java, tawny of different shades, with a greyish cast, is more frequent. In some the head is of a darker colour, in others large spots of dark appear on the back, or the tail is above barred with dark. The upper part of the nose, a ring encircling the eyes, and the ears appear in all individuals to be of a darker brownish colour, and all have a more or less distinct large white spot on the anterior and upper part of the thigh. The back of the feet is either dark brown or fulvous. The palms, soles, mammæ and genital organs, are black in all. The single hairs of the back are greyish-brown at the root, darker than the apex, which imparts the general colour to the back. With the hairs of the tail the reverse is the case, the basal half being isabella or white; the apical darker. On the lower surface of the distichous tail, the roots of the hairs form a white line on either side of the vertebræ, which are covered with short, dark-brownish, or fulvous hairs. The under-parts of the body are of the same colours as those of the black-coated animal, but their roots are yellowish-white. The mustachios, whiskers, and other bristles, are

in all of a blackish-brown; but the single bristles of the abdomen are sometimes fulvous.

The black-coated individuals stand in a similar relation to the light-coloured varieties, as that in which the black-coloured *Hylobates Lar* stands to the light-coloured. Such differences of colour, wide no doubt, are of no uncommon occurrence among the Malayan Mammalia, and ought to be well considered by Zoologists, who have not the opportunity of studying the living animals.

This, as well as the rest of the Malayan squirrels, is capable of being tamed to a certain extent, and evinces attachment to those who feed them, but the appearance of a strange person, animal, or even an unusual sound, startles them, and recalls their natural shyness. The largest of a great number, measured from the apex of the nose to the root of the tail one foot six inches; the tail one foot nine and a half inches. The intestinal canal was of the following dimensions:

Small Intestines,	..	..	..	9 feet 6 inches.
Large ditto,	..	..	..	4 ,, 9 ,,
Cæcum,	..	..	..	1 ,, 2 ,,

SCIURUS RAFFLESII, Vigors and Horsfield.

SYN.—*Sciurus rufogularis*, Gray.

Sciurus rufoniger, Gray.

Sciurus Prevostii, Desmar. apud Schinz.

“Túpai baláng” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Java, Borneo, China* (Canton.)

* China is the habitat assigned to *Sciurus rufogularis*, Gray. Without doubting the authenticity, it is perhaps as well to observe, that skins of the more showy animals and birds of India, Malacca, and the Indian Archipelago, are offered for sale as indigenous productions in the shops of Canton and Macao. Skins of *Halcyon Smyrnenis* for instance, and other birds from different parts of India, are bought up by the Chinese merchants of our colonies in the Straits of Malacca, who annually, on Chinese Junks, ship quantities of considerable value to China, where they are manufactured into fans and artificial flowers. In a list of birds, contained in a collection of Chinese productions, exhibited in London in 1842, Mr. H. E. Strickland observes in his communication to the Zoological Society, that some of them appear to have been imported from Malacca. Skins and other parts of a host of animals, from the most distant parts of Asia, form items in the Chinese Pharmacopoeia. On my visits to Chinese Dispensaries in China and in our Malayan Colonies, I have been shewn horns of rhinoceroses and deer, tusks of the Duyong, heads of Buceris, tortoise-shells, and well preserved skins of *Trigonocephalus Blomhoffii*, from Japan; Ammonites and other fossils, *cum multis aliis*, all supposed to possess specific virtues, and accordingly prescribed by Chinese Medical practitioners.

This species, numerous in the Malayan countries, occurs with the following individual variations of colour—

Cheeks and throat iron-grey, shoulders uniformly, or mixed with red. (*Sciurus rufogularis*, Gray. *Mag. Nat. Hist.* 1842, p. 263.)

The cheeks are sometimes dark-brown, or ferruginous.

In some the white lateral line commences from the side of the nose, passing over the cheeks, the side of the neck, and over the shoulder. The lateral line is either pure white, more or less distinct, or mixed with single longer hairs with black apex.

Some have a short black line immediately below the white; in others there is above the latter a grizzled line, sometimes continued over the outside of the thigh. The tail is seldom uniformly black, frequently partially black, reddish or grizzled, owing to the apex of the hairs being white. The tuft is frequently reddish or rust-coloured.

The feet are sometimes white or pale ferruginous.

The Museum of the Asiatic Society possesses a specimen from Java, differing from *Sciurus rufoniger*, Gray, in having the tail grizzled instead of black. *Sciurus redimitus*, Van der Boon, is probably another variety of *S. Rafflesii*.

A young male, about a fortnight in confinement, after having finished his usual meal of cocoanut, seized and devoured an *Iora typhia*, which had just been shot, and happened to be placed within reach. Sparrows and other smaller birds were subsequently eaten, and apparently relished.

The largest male measured from the apex of the nose to the root of the tail eleven and a half inches; the tail one foot two inches.

SCIURUS HIPPURUS, Is. Geoffroy.

n.—*Sciurus erythræus*, Pallas (?)
Sciurus caudatus, McClelland? } Apud Gray: List.
Sciurus anomalus, Kuhl.

Sciurus rufogaster, Gray.

Sciurus castaneiventris, Gray.

“Túpai Jinjang,” “Ummu,” or “Jau” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Java, Sumatra, Assam, China (Canton).

The ground colour of the Malayan individuals differs but slightly, according to the more red or yellow rust colour of the bands of the hairs. The anterior part of the tail above is of the same colour as the back, the rest is either uniformly black, reddish, or with transverse bands, or has the tuft of that colour. The colour of the ears is brownish in some, but generally of the leaden grey, grizzled colour of the head, cheeks, chin and outside of the limbs. The feet are black or slightly grizzled.

The largest individuals of this numerous species measure from the apex of the nose to the root of the tail one foot; the tail one foot and half inch.

SCIURUS VITTATUS, Raffles.

SYN.—Túpai, Raffles.

Sciurus bivittatus, Raffles, Desmar. } Apud Horsfield.
 Ecureuil Toupai, F. Cuvier, }

Macroxus Toupai, Lesson, apud Gray: List.

Sciurus flavimanus, Is. Geoffroy, apud Schinz.

“Túpai” of the Malays of the Peninsula.

HAB.—*Singapore, Pinang, Malayan Peninsula.*

Sumatra, Borneo, Canton.

This is the most numerous species in the Straits of Malacca, the largest individuals measuring from the apex of the nose to the root of the tail eleven inches; the tail eleven inches.

SCIURUS NIGROVITTATUS, Horsfield.

SYN.—Sciurus griseiventer, Is. Geoffroy, apud Schinz.

HAB.—*Malayan Peninsula.*

Java, Sumatra, Borneo, Canton.

Not numerous; the largest individual observed, a female, measured from the apex of the nose to the root of the tail nine inches; the tail eight and half inches.

SCIURUS TENUIS, Horsfield.

SYN.—Sciurus modestus, S. Müller?

HAB.—*Singapore, Malayan Peninsula.*

Java, Sumatra, Borneo, Canton.

Of two individuals observed, the larger, a male, measured from the apex of the nose to the root of the tail six inches; the tail seven inches.

SCIURUS LATICAUDATUS, Diard, Var.

SYN.—*Sciurus laticaudatus*, Diard, apud S. Müller?*

HAB.—*Malayan Peninsula*.

The present squirrel differs from the diagnosis of *Sciurus laticaudatus* from the west coast of Borneo, (communicated in *Natuur en Geneeskundig Archief*, &c. II Jaarg. I Aflev. p. 87,) in having neither the first nor the fifth molar of the upper jaw very large. Both are of nearly equal size, and much smaller than the rest. The following is a description of the Malayan animal.

The shape of the head is depressed, elongated, conical, gradually attenuated towards the laterally compressed nose. The whole outline, the slender form, and general colours, render the animal strikingly similar to *Tupaia ferruginea*. The eyes are large, brilliant, dark; the ears large, oval, with smooth short hairs; the mouth is small, the upper incisors are very minute, the lower slender, flattened, and almost straight; the black mustachios, whiskers, superciliary and gular bristles, and the few white ones of the forearm, are all shorter than the head; the muzzle hairy, leaving the margins of the small, and at the apex laterally pierced nostrils, naked. The limbs and feet slender; the nailless tubercle of the thumb rudimentary, barely perceptible in the living animal. The claws are small, sharp, compressed, whitish.

The colour of the head, back, outside of the limbs and feet, is a rich rusty-red, mixed with shining black, particularly on the occiput, the back and the feet, less on the sides, where the ferruginous prevails; the throat, chest, abdomen and inner side of the limbs, whitish; in some individuals pale-yellowish. The fur is soft and delicate. The separate hairs are leaden-grey at the base, shining black, or with a broad subterminal ferruginous band. The tail is shorter than the body, distichous, broadest in the middle, attenuated at the root, terminating in a thin tuft. It may be compared to a feather, black on each side of the quill, successively ferruginous, again black, margined with buff.

* In the *List of Mammalia in the British Museum* occurs a genus: *Rhinosciurus*, Gray, and a species *R. tupaoides*, Gray, Syn. *Sciurus laticaudatus*, Müller? ? Generic or specific characters being neither given nor referred to, it is impossible in India to decide whether the specimen in the British Museum thus labelled, is identical with the animal here characterised.

Such is the succession of the bands on the separate hairs. This organ is less full and ornamental than in the generality of squirrels. The species is apparently not numerous; the largest out of five examined, a female, was of the following dimensions—

Length from the apex of the nose to the root of the tail,	10	$\frac{6}{8}$	inch.
„ of the tail,	6	$\frac{4}{8}$	„
„ of the head,	2	$\frac{3}{8}$	„
„ from the apex of the nose to the anterior angle of the eye,	1	$\frac{2}{8}$	„
„ from the posterior angle of the eye to the ear,	0	$\frac{5}{8}$	„
Breadth above the apex of the nose,	0	$\frac{1}{8}$	„
„ between the anterior angles of the eyes,	0	$\frac{7}{8}$	„
„ between the ears,	0	$\frac{6}{8}$	„
Diameter of the head at vertex,	1		„

Its habits in confinement presented nothing remarkable.

GEN.—PTEROMYS, Cuvier.

PTEROMYS NITIDUS, Geoffroy.

SYN.—*Sciurus petaurista*, Lin. apud Cuvier ?

Sciurus petaurista, Chin Krawa, Raffles ?

Pteromys albiventer, Gray Illustr.

“Túpai Térbang” or “Kúbin” of the Malays of the Peninsula.

HAB.—*Singapore, Pinang, Malayan Peninsula.*

Java, Sumatra, Borneo.

The part of the head anterior to the ears, the cheeks, the chest, and the abdomen, are white in some individuals of either sex, one of which is figured in Hardwicke's *Illustrations of Indian Zoology*, under the denomination of *Pteromys albiventer*, Gray.

The black, or dark-brown eyelids, nose, chin, feet and tip of the tail, appear to be constant characters. The shade, and intensity of the red colour is liable to considerable variations.* In the very young, there is a short black stripe behind the ears; and the posterior part of the back and anterior half of the tail are shining black, from each separate hair having the apex of that colour. Traces of these characters occur in some adult individuals. This species is very numerous in the Malayan countries. It is not strictly nocturnal, for it is frequently seen abroad

* In an individual from Malacca, the back was very dark Indian-red, with a few dashes of pure white. The identity of the species is, however, doubtful.

during the day. It is particularly fond of the Durian, the fruit of *Durio Zibethinus*, Linné. The flying squirrel has this partiality, in common with various other animals, as monkeys, Pteropi and Paradoxuri; nay, the Malays assert, that they have to watch this, their favourite fruit, against tigers.

In a female, measuring from the extremity of the nose to the root of the tail, one foot six and half inches; the tail one foot nine inches: the intestinal canal was of the following dimensions—

Small Intestines,	..	..	..	7 feet 4½ inches.
Large,	..	..	..	5 „ 2 „
Cæcum,	..	..	..	2 „ 4 „

SCIUROPTERUS, Fred. Cuvier.

SCIUROPTERUS HORSFIELDII, Waterhouse,

SYN.—*Pteromys aurantiacus*, Wagner, apud Gray: List.

HAB.—*Malayan Peninsula*.

Java? Sumatra?

A single skin, brought from Kéddah, measured from the apex of the nose to the root of the tail eight and three-eighth inches; the tail eleven inches.

SCIUROPTERUS GENIBARBIS.

SYN.—*Pteromys genibarbis*, Horsfield.

“Kechubu” Horsfield.

HAB.—*Malayan Peninsula*.

Java.

Of two, the larger, a male, measured from the apex of the nose to the root of the tail seven and half inches; the tail seven inches.

MURIDÆ.

GEN.—MUS, Linné.

MUS BANDICOTA, Bechstein.

SYN.—*Mus giganteus*, Hardwicke,
Mus malabaricus, Shaw,
Mus perchal, Shaw,
Mus Icria, Buchan. Ham. MS.
Mus nemorivagus, Hodgson,

} Apud Gray: List.

Tikus besár of the Malays of the Peninsula.

HAB.—*Pinang, Malayan Peninsula*.

Southern Mahratta Country, Bengal, Nipal.

MUS DECUMANUS, Pallas.

SYN.—Mus javanus, Pallas, apud Schinz.

Mus norvegicus, Brisson, apud Gray : List.

“Tikus” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula, Pinang.*

Cosmopolita.

MUS SETIFER, Horsfield.

SYN.—‘Tikus virok,’ Horsfield.

Mus giganteus, Temminck, apud Gray.

HAB.—*Pinang.*

Java, Sumatra, Borneo, Van Diemen’s Land.

The larger of two individuals, captured in gardens, measured head and body, ten and one-eighth inches; the tail seven and four-eighth inches.

MUS RUFESCENS, Gray.

SYN.—Mus flavescens, Elliot, } Apud Gray : List.
Mus rufus, Elliot,

HAB.—*Pinang.*

Dharwar, Madras, Bengal, Arracan.

In the young, the brown bristles are fewer, and leave the lead-coloured under-fur more apparent. The colour of the abdomen is paler yellowish-grey than in the adult. The species is numerous at Pinang in out-houses. In the largest observed, the head and body measured seven and six-eighth inches; the tail (mutilated,) four and two-eighth inches.

MUS MUSCULUS, Linné?

SYN.—“Tikus rúma” of the Malays.

HAB.—*Pinang.*

In colours, this slightly differs from the European mouse, the upper parts being a mixture of shining grey and tawny. The separate hairs are leaden-grey at the base, then tawny with black apex; some are longer and uniformly dark-brown. Beneath pale-ash. The ears are large, more than one-half of the length of the head, with very short hairs, rounded, blackish. Toes, palms and soles, whitish. Tail slender, dark-grey, with very short appressed brown hairs. Length of the head and body, two and five-eighth inches: tail two and four-eighth inches.

GEN.—RHIZOMYS, Gray.

RHIZOMYS SUMATRENSIS, Gray.

SYN.—*Mus sumatrensis*, Raffles.

“Dekan,” Raffles.

Hypudeus de Sumatra, Temm.	} Apud Gray: List.
Nyctocleptes Dekan, Temm.	
Spalax javanus, Cuvier,	

Rhizomys chinensis, Gray, apud Schinz.*Rhizomys cinereus*, McClelland.**Rhizomys Decan*, Schinz.

“Tikus búlow” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

China, Moulmein, Assam.

Although the animal was first described in Sir Stamford Raffles' catalogue of collections, made in Sumatra, the author distinctly states that it was forwarded from Malacca by Major Farquhar; nor does it appear to inhabit Sumatra, although the specific name would lead one to suppose that such is the case. The colour of the adult is liable to individual variations, from grey of different shades to isabella or silvery-buff. The separate hairs are mostly of the colour prevailing in the individual, mixed with single dark-brown hairs with whitish apex, particularly on the vertex, continuing along the centre part of the back. On the nose, anterior part of the head, and on the cheeks, the hairs are of a pale rust colour. On the vertex some white hairs form either a spot or a short line of that colour. The scanty hairs of the abdomen are all of a pale-greyish or isabella colour. The mustachios, whiskers, superciliar and gular bristles, are either of a pale-brown or buff colour. The young are above of a dark-grey, with a brown streak on the vertex and

* The description of this supposed species (*Calcutta Journal of Nat. Hist. Vol. II. p. 456, Pl. XIV.*) states, “There are four toes to each fore-foot, and five to each hind-foot.” The draughtsman of *Pl. XIV*, “*Rhizomys cinereus*,” has, at all events, observed, that all the feet are *five-toed*, however incorrectly he has represented the animal. Another error occurs in the description, viz: “Sir Stamford Raffles describes a species of Bamboo Rat found in Sumatra by Colonel Farquhar,” &c. Sir S. Raffles' words are these: “*MUS SUMATRENSIS*. A drawing and specimen of an animal, which appears related to the *Mus pilorides*, was forwarded from Malacca” (*not Sumatra*, as erroneously asserted) “by Major Farquhar, to the Asiatic Society at the same time with the Binturong. I am informed by him that it is not uncommon at Malacca, and is perhaps to be found in most parts of the Malay Peninsula,” &c. *Transact. Linn. Society, Vol. XIII. Part II.*

back; beneath pale-grey. The forehead, nose, temples, and cheeks, are ferruginous. The adult, like some squirrels and rats, is subject to enlargement of the scrotum. In confinement, it is very savage, scarcely tameable. The length of the tail varies from about one-third to little more than one-fourth of the length of the body. It is blackish, or brownish; the apex whitish. The largest male examined, measured from the apex of the nose to the root of the tail one foot seven and a half inches; the tail five and a half inches. The female, in size and colours equalling the male, has ten mammæ, viz. two axillary, and three inguinal pairs.

GEN.—HYSTRIX, Cuvier.

HYSTRIX LONGICAUDA, Marsden.

SYN.—*Acanthion javanicum*, Fred. Cuvier?

Hystrix brevispinosus, Schinz.*

“Bábi Lándak” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Java, Sumatra, Borneo.

Sir Stamford Raffles has pointed out the inaccuracy of Marsden's figure, representing the fore-feet with five toes, instead of with four, and a rudimentary thumb with a flat nail. The figure also has a few mane-like long bristles on the head, whereas the mustachios are situated on the side of the nose, the whiskers below the ear, and one or two bristles above the eye. In colours, this species resembles *Hystrix leucurus*, Sykes, from which it differs in the absence of the long mane-like bristles of the head and neck. Although single, scattered, thin, flexible spines, upwards of twelve inches in length, occur on the posterior part of the back, the majority of inflexible spines are much shorter than in *Hystrix leucurus* or *H. cristatus*, and are either pure white, or with a blackish band in the medial portion. The short, blackish, slightly iridescent spines of the neck, anterior part of the back, the limbs, and abdomen, are generally grooved on the upper surface. The short white pedunculated tubes of the posterior part of the tail are at first closed, terminating in a short spine, which latter wears off, leaving the tubes open. The pubes

* In “*Nachträge zum 2ten. Bande*,” this species is supposed to be identical with, and substituted for *Atherura fasciculata*, although a very correct description is given of both.

are disposed in a wreath of stiff bristles, frequently of a deep rust colour. The epidermis of this species, as well as of *Atherura* is remarkably thin and liable to be torn. Beneath the skin appears a fatty tissue, upwards of an inch in thickness. The anterior molars are slightly larger than the rest. Viewed from above, *in situ*, the crown of the anterior lower molar of either side presents the form of two letters S, facing each other (S \bar{S}). In a fœtus,—of which the head measures two and one-eighth inches, the body four and three-eighth inches, the tail one inch in length,—the whole of the body, and the anterior half of the tail have numerous short hairs, disposed on separate transverse lines of six to eight distant black hairs, becoming longer on the posterior part of the back and sides. The posterior part of the tail has longer and closer hairs. In a female, measuring from the apex of the nose to the root of the tail two feet five inches, the tail four inches; the intestinal canal was of the following dimensions:

Small Intestines,	21 feet	6 inches.
Large ditto,	5 „	10 „
Cæcum,	1 „	7 „

The stomach is of a heart-shaped outline, with thin membranes externally smooth, internally with a few longitudinal rugæ near the narrow fundus.

The species is numerous, and, as it is considered a delicacy by the Chinese population, is frequently brought to market.

GEN.—*ATHERURA*, Cuvier.

ATHERURA FASCICULATA, Cuvier.

SYN.—*Hystrix fasciculata*, Lin., apud Cuvier.*

Hystrix orientalis, Brisson, apud Gmelin.

Hystrix macroura, Linné.

Porc-épic de Malacca, Buffon.

Hystrix fasciculata, Shaw, apud Raffles.

Mus fasciculatus, Desmarest.

Hystrix fasciculata, Linné, apud Gray: Illust.†

* No species of that name occurs in *Systema Naturæ*, Ed. XIII. Gmelin, 1788, but *Hystrix macroura* is described “cauda longitudine corporis”(??) “apice fasciculo pilorum” &c.

† In the figure, the anterior foot has one toe too many, the animal having four toes and a rudimentary flat-nailed thumb. Nor is the back of the hind foot naked, unless indeed become so by accident.

Acanthion javanicum, F. Cuv.

Atherurus fasciculatus, Schinz.

Atherurus macrourus, Schinz.

“Lándak” of the Malays of the Peninsula.

HAB.—*Pinang, Malayan Peninsula.*

Java, Sumatra, Borneo.

The nose, lips, forehead, and back of the feet, are covered with greyish-brown hairs. The body and limbs at the root of the spine, are covered with dense soft silky hairs, grey on the upper parts, and silvery on the abdomen. Single longer flexible spines, white with a dark central band, are scattered over the back. The anterior part of the tail is, like the back, covered with flat-grooved spines, white at the root, then slightly iridescent brown, and frequently with white apex. The centre part of the tail is scaly, with very short spines between the scales. The posterior part is white; with white or silvery, flexible, and in length gradually increasing, spines, which Buffon has aptly compared to narrow slips of irregularly cut parchment. The pubes are of a deep rust colour.

This species is very numerous in the Malayan valleys and hills. In fretful habits, and in its food, it resembles the preceding porcupine, like which, it is carried to the market at Pinang and Malacca, where as many as twenty to thirty may frequently be seen. In a male, measuring from the apex of the nose to the root of the tail one foot ten inches, the tail ten inches; the intestinal canal was of the following dimensions :

Small Intestines,	..	..	19 feet 4½ inches.
Large, ..	..	..	5 „ 3 „
Cæcum,	..	..	1 „ 3 „

The stomach is of a general outline, resembling that of *H. longicauda*, but it differs in having an external deep vertical sulcus, dividing the stomach into a pyloric and a cardiac portion, which latter presents 6 to 7 deep oblique sulci. The membranes of the stomach are thick and muscular. Internally the cardiac portion is transversally divided by six or seven ridges, corresponding to the external sulci, intersected by numerous concentric rugæ. The pyloric portion, separated from the cardiac by the rugæ produced by the external vertical sulcus, is much smoother, and has but few rugæ.

EDENTATA.

GEN.—MANIS, Linné.

MANIS JAVANICA, Desmarest.

SYN.—*Manis pentadactyla*, Lin., apud Raffles.*Manis aspera*, Sundeval.*M. quinquedactyla*, Raffles, apud Gray : List.

“Pengóling” or “Tangíling” of the Malays of the Peninsula.

HAB.—*Pinang, Malayan Peninsula.*

Java, Sumatra, Borneo.

The series of dorsal scales vary in individuals from 16 to 19. The number of central dorsal vary from 20 to 22; the central and the marginal caudal from 26 to 29: in the young all the scales are finely lineated and the rounded apex only is smooth. With age the lines become obliterated on the exposed surface of the scales, between which appear a few long whitish bristles. The very young animal corresponds to the description of *Manis aspera*, Sundeval. The eyelids, the margins of the ears, and the scaleless parts, except the palms and soles, are scantily provided with short whitish hairs. The two pectoral mammæ are situated at a short distance from the axilla. Its habits present nothing different from those of *Manis crassicaudata* (*M. pentadactyla*, Linné), of which an interesting account is communicated by Lieut. R. S. Tickell in *Journal Asiatic Society*, Vol. XI. 1842. p. 221.

The present species, although numerous in rocky situations, is not often captured, as it is seldom abroad till after sunset. The largest male measured from the apex of the nose to the root of the tail one foot nine and a half inches; the tail one foot eight inches. In a younger male, the entire length of which was one foot eleven inches; the intestinal canal was of the following dimensions:

Small Intestines,	8 feet 4 inches.
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Large ditto,	0 ,, 6 ,,
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Cæcum is rudimentary, indicated by a slight, yet distinct widening of the intestines. The stomach is capacious, the pyloric region thickened and gizzard-like. On the external surface, where the greater curvature begins to ascend, is situated a small (one inch in length, one and three-eighth in breadth) triangular, externally gyrated, glandular body, firmly attached to the stomach, but not communicating with the cavity. Its

external appearance might be compared to that of a crest of ostrich feathers. The narrowed apex, towards the pylorus, is provided with a small, thick, rounded and wrinkled opening, surrounded by concentric fibres, leading by a common, short, cylindrical duct to the broader cavity, which latter is divided by two longitudinal parietes into three separate portions. If a tube is introduced into the common duct, the air injected will simultaneously fill all three portions of the cavity, but if the tube is inserted into any one of the three separate portions, the air will fill that particular portion, leaving the two others collapsed. The interior surface of this organ secretes a whitish mucus. Adjoining the common opening, from ten to eleven small rounded glands commence, arranged on a line towards the pylorus. Each gland has, in its centre, a minute wrinkled opening, leading into a small cavity secreting mucus.

The stomach was extended by the remains (heads and legs,) of a prodigious quantity of large black ants, inhabiting the hills. The contents of the stomach were involved in mucus, deeply tintured with bile, and among them appeared five small rounded fragments of granite. Another individual expired after 10 days confinement, during which period it took no food, although it was repeatedly placed among swarms of the black and red ants, so excessively numerous in the valley of Pinang. Water it always took when offered, lapping it up with the tongue in the same manner that serpents drink.

Costæ veræ 8 pairs; spuria 7 pairs = 15 pairs. The ensiform process of the os sternum is greatly elongated, terminating in a broad, rounded, thin cartilaginous plate.

PACHYDERMATA.

PROBOSCOIDEA.

GEN.—ELEPHAS, *Linné.*

ELEPHAS INDICUS, *Linné.*

SYN.—“Gajah” of the Malays.

HAB.—*Malayan Peninsula.*

India, Burma, Siam, Ceylon, Sumatra, Borneo.

Elephants are very numerous on the Malayan Peninsula. They may be procured at the following rates :—

“ For an elephant 4 feet 6 inches high, ..	120	Dollars.
Ditto, 5 „ 3 „ ..	200	„
Ditto, 6 „ 0 „ ..	220	„
Ditto, 6 „ 9 „ ..	400	„
Ditto, 7 „ 6 „ ..	420	„

Those exceeding this height are paid for at an advance on the last mentioned rate of 20 dollars for one foot six inches. If above eight feet and three inches, then an addition of 40 dollars for each one foot six inches is charged. Elephants ten feet six inches in height are taken by the Siamese to the Capital, and it is not permitted to sell them. The Keddah chiefs used formerly to breed elephants, a speculation rarely, if ever, attempted elsewhere. Coromandel Native Traders were, until late years, constantly in the habit of loading vessels with elephants for that Coast.” (Extract from Lieut. Colonel James Low’s “*Dissertation*” &c.)

ORDINARIA.

GEN.—SUS, Linné.

SUS INDICUS, Schinz.

SYN.—Sus Scrofa, Linné, apud Elliot.

Sus indicus,
Sus Scropha, Hodgson, } Apud Gray: List.
Sus vittatus, Schlegel.

Sus cristatus, Wagner, apud Schinz.

“ Bâbi útan” of the Malays of the Peninsula.

HAB.—Malayan Peninsula, Pinang, Singapore, Lancavy Islands.

Bengal, Nipal, Southern Mahratta Country.

The difference between the Indian and the German wild hog (*Sus Scrofa ferus*, Lin.) have been pointed out by W. Elliot, Esq. (*Madras Journal*, Vol. X. 1839, p. 219.) The colour of the adult is brownish-black, scantily covered with black hairs, of which few retain the infantile yellowish sub-terminal band. Besides the black recumbent mane of the occiput and back, the whiskers and bristles above and below the eye, there is a bundle of long black bristles on the throat. The hairs of the throat and chest are reversed. The tail is scantily covered with short hairs, the apex compressed, with long

lateral bristles, like those of the elephant, arranged like the wings of an arrow. The young is more hairy, with the plurality of hairs tawny or fulvous, some with black root and apex, which, as they are more or less mixed with black hairs, produce on the sides of the body saturated fulvous stripes. The hairs of the throat, chest, abdomen, and elbows, (in the two latter places very long,) are black at the basal, and white at the apical half. Wild hogs are exceedingly numerous on the Peninsula, and most of the Malayan Islands. The largest boar examined measured from the apex of the nose to the root of the tail, five feet; the tail one foot. The stomach of a young boar, examined shortly after it had been speared, was extended with food, principally consisting of the remains of a very large coleopterous larva, some small seeds of different kinds, leaves, grass and roots.

SUS SCROFA, VAR. SINENSIS, Linné.

SYN.—“Babi” of the Malays.

Introduced by the Chinese settlers.

GEN.—RHINOCEROS, Linné.

RHINOCEROS UNICORNIS, Linné.

SYN.—Rhinoceros indicus, Cuvier.

Rhinoceros asiaticus, Blumenbach.

Rhinoceros inermis, Lesson.

“Bádak” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Bengal, Assam, Nipal.

RHINOCEROS SONDAICUS, Cuvier.

SYN.—Rhinoceros sondaicus, Cuvier, } Apud Horsfield.
 “Wárak,” “Bádak,”

Rhinoceros javanensis, F. Cuvier, apud Schinz.

HAB.—*Malayan Peninsula*.

Java.

This, as well as the former species, appears to be numerous on the Malayan Peninsula.

A *two-horned* Rhinoceros is stated by the Malays to inhabit, but rarely to leave, the densest jungle. The Museum of the Asiatic Society possesses a skull, and also a head with the skin on, of *Rhinoceros Sumatranus*, Raffles, from the Tenasserim Provinces, in which locality the existence of the species has been recorded by Dr. Helfer and Mr. Blyth. This fact would seem to corroborate the statement of the Malays, and the habitat of *Rhinoceros Sumatranus* may reasonably be expected to be hereafter found to extend over the neighbouring Malayan Peninsula. As such, it has indeed been enumerated by Capt. Begbie, the author of "*Malayan Peninsula*," &c., Madras, 1834. In Lieut. Col. Low's *History of Tenasserim* (Journal Royal Asiatic Society, vol. 3. 1836,) is figured the head of a young Rhinoceros, which, from the considerable protuberance between the eyes, appears to represent a two-horned, probably the present, species.

GEN.—TAPIRUS, Linné.

TAPIRUS MALAYANUS, Raffles.

SYN.—*Tapirus malayanus*, apud Horsfield.

Tapirus indicus, Fred. Cuvier.

Tapirus sumatranus, Gray.

Me des Chinois, Remusat, young? apud Gray: List.

Tapirus bicolor, Wagner, apud Schinz.

"Bádak," "Kúda Ayer," "Tennú" of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Sumatra, Borneo.

The body of a newborn male, found in Province Wellesley in August 1844, was shortly after its death carried over to Pinang. As described by Colonel Farquhar, it was of a beautiful black velvet colour, with purple reflections, with numerous small, and other larger, irregular spots on the body, arranged in longitudinal stripes, above of a rich gamboge, beneath and on the inner side of the extremities, paler yellow. The under-lip was white. The shrivelled remains of the black funiculus umbilicalis were upwards of four inches in length. The fur very short, dense, and velvety. The separate hairs, of either of the two prevailing colours, slightly curly.

DIMENSIONS.

Length from the apex of the nose to the root of the tail,	1 foot 10 inches.
„ of the head,	0 „ 7 „
„ of the tail,	0 „ $1\frac{2}{8}$ „
„ of the ear,	0 „ $1\frac{6}{8}$ „
Diameter of the head from vertex,	0 „ 5 „
Height of the shoulder,	0 „ $8\frac{2}{8}$ „
„ „ „ haunch,	0 „ 9 „

The animal, from which a sketch was taken on its arrival at Pinang, was the property of the Rev. R. Panting, A. M. The skin, imperfectly preserved, has lately been deposited in the Museum of the Asiatic Society.

On the 16th of May 1845, I obtained a living young female Tapir, captured in Keddah a few days previously. Though still in its infantile garb, it was older than the preceding. The ground colour was a brownish-black, like worn-out velvet; the spots, stripes, and the posterior part of the abdomen were of a dirty-white. The separate hairs were longer and curly; the hairy ears retained numerous white spots on the margins and external surface. The lips were blackish, with numerous short distant bristles, which also appeared round the nostrils, on the ridge of the nose, above and below the eyes, on the cheeks and on the throat. Two black mammæ were situated between the hind legs, three and a half inches behind the large naked cicatrix of Funiculus umbilicalis.

DIMENSIONS.

Length from the apex of the nose to the root of the tail,	3 feet $4\frac{3}{8}$ inches.
„ of the head,	1 „ 0 „
„ of the tail,	0 „ $1\frac{2}{8}$ „
„ of the ear,	0 „ $5\frac{4}{8}$ „
Diameter of the head from vertex,	0 „ $5\frac{4}{8}$ „
Height of the shoulder,	1 „ 4 „
„ „ „ haunch,	1 „ 6 „
Greatest circumference round the body,	2 „ 6 „
Circumference at the root of the ear,	0 „ 6 „

DENTITION.

Incis. $\frac{6}{6}$ Canin. $\frac{0.0}{1.1}$ Molar, $\frac{3.3}{3.3}$

From the first, although fresh from its native wilds, this young Tapir shewed a remarkably gentle disposition. The daytime it spent in sleeping in a dark recess of the portico of my house, though it would rouse itself if noticed. Towards sunset it became lively, would bathe, feed, saunter abroad, and with its lengthened nose examine objects in the way. Within a few days after its arrival, it commenced to exhibit a marked partiality to the society of man, not indeed to its keeper in particular, whom it scarcely had discrimination enough to distinguish, but to any body who happened to notice or caress it. Towards sunset, it would follow a servant on the green in front of the house, and punctually imitate his movements, whether standing, walking, or running. If the man suddenly hid himself, the Tapir would hasten to the spot where it had lost sight of its leader, look about in all directions, and, if unsuccessful in discovering him, express its disappointment by a peculiar loud whistling. On the re-appearance of the man, it expressed its pleasure by rubbing its side against his legs, running between them, occasionally giving out a short singular sound, resembling that produced when the larger wood-peckers tap the trees, but more sonorous. When of an evening it heard the voices of people in the verandah above the portico, it exhibited strong marks of impatience, till let loose, when of its own accord it would, awkwardly enough, ascend a flight of stairs leading to the verandah. It would then quietly lie down at their feet, and by stretching its limbs and shaking its head, express the satisfaction it derived from being caressed; and it was only by compulsion that it could be made to leave the company. Its food consisted of plantains, pine-apples, mangustins, jambu, leaves of *Ficus pipul*, sugar-cane, and boiled rice, of which latter it was particularly fond, if mixed with a little salt. Its drink was water, and also milk and cocoanut oil, which latter taste the Tapir possesses in common with the O'rang-útan. It delighted in bathing, and was otherwise cleanly. When roaming about the garden, (its walk was like that of the elephant,) it would select a spot with soft earth, and like a cat form with its hind legs a small excavation, and

again cover it. The whole body has a peculiar, and by no means offensive exhalation, somewhat resembling that noted of *Arctictis Binturong*. Indeed, this is so tenacious, that although the skin of the individual above described has been preserved more than a twelvemonth, and kept in a strongly camphorated case, the odour is still perceptible.

On the 27th of June 1845, the subject of the preceding notice expired after two days' illness, from inflammation of the lungs, brought on by the strong southerly winds, prevailing throughout the Straits of Malacca during the season, which in man produce a slight influenza, in animals frequently terminating fatally. The few adult Tapirs, which occasionally have been kept in confinement by residents at Malacca, have acquired the character of being hardy animals. During the short period that the present lived in my possession, no perceptible change appeared in its growth, but a striking alteration took place in its colours. Nearly all the white spots on the head, nape of the neck, and back of the ears, gradually disappeared, and the upper part only of the margin of the ears remained white, which colour it retains in the adult animal. On the posterior part of the back and sides, the black and white stripes were in a state of progressing obliteration, their hairs had faded to a brownish colour, and were about being replaced by a shorter and less dense fur of the fresh white hairs, which were to form the characteristic permanent white mark, already appearing in outline, when death terminated the unfinished process of nature.

Vertebræ; cervical seven, of which the atlas and epistrophæus are the largest; dorsal twenty; lumbar four; sacral seven; caudal three.

Sternum. The anterior extremity cartilaginous, sharply keeled, arched, continued over manubrium, composed of two rounded angularly-joined pieces, as far as the second pair of ribs; corpus composed of five pieces, of which the two posterior, in a pair, are connected by cartilage.

Costæ veræ, eight pairs; spuria, twelve pairs = twenty pairs; the last spurious rib is rudimentary, and absent on the left side.

Femur, five and two-eighth inches long; the large bony sub-trochanteric process, described by Sir Everard Home, is developed, though partly cartilaginous, measuring one inch in length at the base.

Liver of moderate size, each lobe divided into two portions of nearly equal size.

Gall-bladder; none.

Spleen; tongue-shaped, flattened, with cutting margins, seven and a half inches in length, one and six-eighth in breadth.

Pancreas; in a state not to admit of accurate examination.

Kidneys; three and six-eighth inches in length; one and six-eighth in breadth.

Renes succenturiati; none.

Urinary bladder; very large.

Stomach; capacious. Its dimensions in the state in which it appeared, distended with food, were—

Length along the smaller curvature,	0 feet 5 $\frac{2}{8}$ inches.
„ „ greater, „	1 „ 9 $\frac{1}{8}$ „
Circumference from cardia round fundus,	1 „ 0 „
„ round pylorus,	0 „ 3 $\frac{1}{2}$ „

The internal surface smooth, villous.

Where the duodenum joins the pylorus, it is considerably widened.

Length of the intestinal canal:

Small Intestines,	27 feet 7 inches.
Large, „	6 „ 4 „
Cæcum,	0 „ 6 „
Average circumference of small,	0 „ 2 $\frac{3}{8}$ „
„ „ large,	0 „ 3 $\frac{1}{2}$ „

Cæcum sacculated, with a longitudinal band on either side. Distended with fæces as it appeared, the greatest circumference close to the fundus was one foot one and a half inch.

In the adult Tapir dissected by Sir E. Home, and which was according to Mr. Yarrell eight feet in length, the relative proportion between the length of the intestinal canal and that of the body, was as eleven to one. In the present young female, the relative length of the intestinal canal is proportionally less than in the adult, being less than as ten to one.

SOLIDUNGULA.

GEN.—EQUUS, *Linné*.

EQUUS CABALLUS, *Linné*.

The horse, “Kuda” of the Malays, appears not to be indigenous in the Peninsula. The few ponies, which the wealthier use for ordinary purposes, are imported either from Siam, Burma, or Sumatra. The Malays either travel by water, or prefer the elephant as a locomotive more dignified than the horse.

RUMINANTIA.

GEN.—*MOSCHUS*, Linné.

TRAGULUS, Brisson.

TRAGULUS KANCHIL, Gray : List.

SYN.—Chevrotain adulte, }
 Chevrotain de Java, } Buffon, apud Gray.

Javan Musk, Shaw.

Moschus Palandok, Marsden.

Moschus Kanchil, Raffles.

Pelandok, Raffles,

Moschus fulviventor, Gray.

"Kanchil" or "Pelándok" of the Malays of the Peninsula.

HAB.—*Singapore, Pinang, Lancavy Islands, Malayan Peninsula.*

Sumatra, Java.

In some individuals the back is nearly black. The colour and distribution of the marks of the chest and abdomen are also liable to individual variations, one of which gave rise to the supposed species: *Moschus fulviventor*. The animal is by the Malays indiscriminately denominated "Káncil" and "Pelándok;" the latter denomination is sometimes *par excellence* applied to the young, and this circumstance in all probability gave rise to the supposed species *Moschus Pelandok*. The species is astonishingly numerous. In Prince of Wales' Island, any number may be procured within a short notice, at the rate of one Spanish dollar per dozen. Knowing the partiality of these deer to the leaves of the sweet potato plant (*Convolvulus batatas*,) the Malays either use traps, baited with this vegetable, or lie in ambush in moonlight nights in fields where it is cultivated, and disable the intruders by throwing sticks at their legs. In confinement, in its native climate, the animal becomes rather delicate, though it occasionally survives, and even breeds. The female has four mammæ, and one or two young at the time. The new-born measures eight and six-eighth inches in length, of which the head is three inches, the tail one inch. The skin of the upper parts is of a pale blackish colour, scantily covered with short, fine, brown hairs. The abdomen and inner side of the limbs are pale yellow; the throat and chest have the dark marks of the adult, but paler. The largest adults measure from the apex of the nose to the root of the tail, one foot six and a half inches; the tail three inches in length.

Cervus aureus, Ham. Smith,
Cervus Philippinus, Ham. Smith,
Cervus albipes, Fred. Cuvier,
Cervus Ratwa, Hodgson,

} Apud Gray : List.

Muntjacus vaginalis, Gray : List.
Cervus Muntiac, Linné, apud Schinz.*
 "Kidang" of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Java, Sumatra, Banka, Borneo, Tenasserim, Nipal, Assam, Bengal, South Mahratta Country, Dukhun.

In a young male, measuring from the apex of the nose to the root of the tail three feet and one inch, the tail seven inches; the intestinal canal was of the following dimensions :

Small Intestines, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	13 feet 10 inches.
Large, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	22 ,, 1 ,,
Cæcum, .. .. .	.. .. .	.. .. .	.. .. .	.. .. .	0 ,, 9 ,,

The right lobe of the liver lies in contact with the right kidney; the spleen with the left.

Gall-bladder; none.

AXIS, Hamilton Smith.

AXIS MACULATUS, Hamilton Smith.

SYN.—*Axis*, Plinius.

Cervus axis, Erxleben, apud Gmelin.

Cervus nudipalpebra, Ogilby, (black Var.)

Axis major, Hodgson,
Axis minor, Hodgson,

} Apud Gray : List.

"Rúsa Búnga" of the Malays of the Peninsula.

HAB.—*Malayan Peninsula, Pinang.*

Sumatra, Bengal, Assam, Nipal, Southern Mahratta Country, Ceylon.

* In "Nachträge zum 2ten. Bande," the author suggests that six distinct species are supposed to lie hid under the denomination of *Cervus Muntiac*, viz :

1. *Cervus styloceros*, Schinz, *Syn. C. Muntiac*, Lin. apud Ogilby. *Hab.* Himalayah.

2. *Cervus Ratwa*, Hodgson. *Hab.* Himalayah.

3. *Cervus albipes*, F. Cuvier. *Hab.* India.

4. *Cervus Muntjac*, Raffles and Horsfield. *Hab.* Java, Sumatra, Banka, Borneo.

5. *Cervus Reevesii*, Ogilby. *Hab.* China.

6. *Cervus antisienensis*, Pucheran. *Hab.* Andes.

Sir Stamford Raffles thinks it probable that the Axis in Sumatra has been introduced from Bengal. It is numerous in Keddah, and at present in Pinang. But it did not inhabit Prince of Wales' Island till one of the last Governors of the late Presidency took the trouble of importing from Bengal some pairs, which were kept in the park adjoining Government House, (Suffolk House.) When the Presidency of Prince of Wales' Island was abolished, and with it all its paraphernalia, except the titles of as many of its officers as were necessary to the continuance of H. M. Court of Judicature, the deer of the quondam Governor's park found their way into the jungle, where they have multiplied to a prodigious extent.

RUSA, Hamilton Smith.

RUSA EQUINA, Hamilton Smith.

SYN.—*Cervus equinus*, Cuvier.

Cervus Rusa, Raffles.

Rusa etam or *Kumbang*, Raffles.

“Rúsa” or “Rúsa étam” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula, Pinang.*

Sumatra, Borneo.

The Malayan individuals correspond with the description given by Sir S. Raffles of *Cervus Rusa*. The lips are whitish; the posterior part of the lower, sometimes dark-brown. Round the eyes and the lachrymal sinus, on the side of the forehead, root of the ears, and on the throat, the hairs are either uniformly pale ferruginous, or have a subterminal band of that colour, the effect of which is to impart a pale rusty tint to these parts. Normally, each horn has three antlers, of which the lower or anterior, commencing from the burr, is directed outwards till towards the apex, which turns slightly inward. The second and outward turned antler commences at the root of the third, and is the shortest of the three. The third is directed inwards, and is the longest of the three. In the number, direction, and size of the antlers, numerous individual variations occur.

According to Mr. Blyth's observations, *Cervus Hippelaphus* has, normally, the third antler much longer than the second; *Cervus Aristotelis* has much larger and more divergent horns, of which the second and third antlers are about equal. Considering the similarity of colours

and size of *Cervus equinus*, *Hippelaphus*, and *Aristotelis*, Mr. Elliot is probably right in considering all three as varieties of the great Indian stag, described by Aristotle under the designation of *Hippelaphus*. (*Madras Journal*, 1839. p. 220.), and *Cervus Peronii*, Cuvier—Cerf du Timor—may probably be added as a fourth variety.

PANOLIA, Gray: List.

PANOLIA ACUTICORNIS, Gray: List?

SYN.—*Cervus frontalis*, McClelland?

Cervus lyratus, Schinz?

HAB.—*Malayan Peninsula*.

A single skull of a stag, killed in Keddah, has the horns so like those of the Munneepore animal, that the species might be taken to be identical, but that the Malays assert theirs to be maned, and of a dark colour, with white spots, like the Axis. This stag is further described as being extremely wary, and therefore seldom seen but on heights inaccessible to man. The skull is of an old male, with the teeth, canines in particular, much ground.

GEN.—ANTILOPE, Linné.

NEMORHEDUS, Hamilton Smith.

NEMORHEDUS SUMATRENSIS, Hamilton Smith.

SYN.—Kambing utan, Marsden.

Antilope sumatrensis, Pennant, apud Raffles.

Cambtan, Fred. Cuvier.

Antilope interscapularis, Lichtenstein, apud Schinz.

“Kámbing útan” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula*.

Sumatra, Tenasserim.

It appears to be numerous on the Malayan Peninsula, but exceedingly difficult to obtain, as it frequents the steepest hilly localities, and is very shy and active.

GEN.—BOS, Linné.

BOS GOUR, Trail.

SYN.—*Bos Gaurus*, Ham. Smith.

Bison Gaurus, Ham. Smith.

Bos aculeatus, Wagler.

The Bison, Low: Hist. of Tenasserim.

Bos (*Bibos*) *cavifrons*, Hodgson, apud Elliot.

Bos frontalis, Lambert, apud Gray: List. (??)

“*Sápi útan*” of the Malays of the Peninsula.

HAB.—*Malayan Peninsula.*

Tenasserim, Hindoostan, Assam, Nipal, Southern Mahratta country.

Numerous in the Malayan Peninsula.

BOS TAURUS, VAR. *INDICUS*, Linné.

SYN.—“*Sápi*” (*S. jántan*, Bull; *S. betína*, Cow) of the Malays of the Peninsula.

Although this kind of cattle is plentifully bred in some of the Malayan countries, it is not in general use, and is less numerous than the buffalo.

BUBALUS, Hamilton Smith.

BUBALUS ARNEE, Hamilton Smith.

SYN.—*Bos indicus*, Plinius.

Bos bubalus, Brisson.

Bos arnee, Shaw.

Bubalus ferus Indicus, Hodgson, apud Gray: List.

Bubalus Buffelus, Gray: List.

“*Karbau*” of the Malays of the Peninsula.

HAB.—*Pinang, Singapore, Malayan Peninsula.*

Tenasserim, Southern China.

The wild buffalo is reported, but apparently without proof, to be indigenous in the Malayan Peninsula. Domesticated, it is very plentiful, and is the principal draft-cattle employed by the Malays and the Chinese settlers. The black-coloured, apparently the hardier, is preferred by the Malays; the reddish-white, freckled with brown, is the greater favourite of the Chinese. Both are very slow, and as observed by Lieut. Col. Low, delicate, and liable to sudden attacks of disease if worked in the sun.

CETACEA.

HERBIVORA.

GEN.—HALICORE, Illiger.

HALICORE INDICUS, F. Cuvier.

SYN.—Dugon, Buffon.

Trichechus Dugong, Erxleben.

Halicore cetacea, Illiger.

Halicore Dugong, Cuvier, apud Raffles.

Halicore Tabernacularum, Rüppell.

Dugungus marinus, Tiedemann, apud Schinz.

“Dúyong” or “Parampúan Laut” of the Malays of the Peninsula.

HAB.—Singapore, Malayan Peninsula.

Sumatra, Philippine, Molucca and Sunda Islands, New Holland, Red Sea.

The Duyong appears not to be numerous at Singapore, still less so to the northward, and has but in few instances been observed in Kwála Mùda, the mouth of the river, which forms the northern boundary of Province Wellesley.

ORDINARIA.

GEN.—DELPHINUS, Linné.

DELPHINUS PLUMBEUS, Dussumier.

SYN.—Delphinus malayanus, Lesson, apud Cuvier.

“Parampúan Laut” of the Malays of the Peninsula.

HAB.—Coasts of Pinang.

Malabar Coast.

The species, although very numerous, and rather heavy in its movements, is rarely captured, except by chance in fishing stakes. The stomach, of a single young individual observed, contained remains of small fishes, apparently *Clupeæ*, and *Glyphisodon caelestinus*, Cuvier.

NUMERICAL LIST OF MAMMALIA inhabiting the Malayan Peninsula and Islands,
and other localities.

1	<i>Hylobates lar</i> , Ogilby.	Malayan Peninsula,	Siam, Burma, Tenasserim.
2	<i>Hylobates agilis</i> , F. Cuvier.	Malayan Peninsula,	Sumatra.
3	<i>Semnopithecus obscurus</i> , Reid.	Malayan Peninsula, Pinang, Singapore.	
4	<i>Semnopithecus albocine- reus</i> , Schinz.	Malayan Peninsula,	Tenasserim.
5	<i>Semnopithecus cristatus</i> , Horsfield.	Pinang, Malayan Pe- ninsula,	Sumatra, Borneo, Banka.
6	<i>Semnopithecus femoralis</i> , Horsfield.	Malayan Peninsula,	Borneo, Sumatra ? Java ?
7	<i>Cercopithecus cynomolgus</i> , Ogilby.	Pinang, Malayan Pe- ninsula,	Sumatra, Java, Banka, Bor- neo, Celebes, Timor, Te- nasserim, Nicobars.
8	<i>Papio nemestrinus</i> , Ogilby.	Pinang, Malayan Pe- ninsula,	Sumatra, Borneo.
9	<i>Nycticebus tardigradus</i> , Waterhouse.	Pinang, Malayan Pe- ninsula,	Java, Siam, Arracan, Te- nasserim, Bengal, Silhet, Assam.
10	<i>Galeopithecus Temminckii</i> , Waterhouse.	Malayan Peninsula and Islands,	Pelew Islands, Borneo, Java, Sumatra, Siam.
11	<i>Rhinopoma Hardwickii</i> , Gray.	Malayan Peninsula,	Southern Mahratta country, Calcutta, Allahabad, Agra, Mirzapore.
12	<i>Megaderma spasma</i> , Geof- froy.	Pinang, Singapore, Malayan Peninsula,	Ternate, Java.
13	<i>Nyctinomus tenuis</i> , Hors- field.	Malayan Peninsula,	Borneo, Java, Sumatra.
14	<i>Taphozous melanopogon</i> , Temminck.	Pulo Tikus, Lancávy, Malayan Peninsula,	Java, Caves of Kanneria.
15	<i>Taphozous saccolaimus</i> , Temminck.	Pinang,	Celebes, Borneo, Java, Su- matra, Southern India.
16	<i>Rhinolophus affinis</i> , Hors- field.	Pinang,	Java.
17	<i>Hipposideros diadema</i> , Gray?	Pinang, Malayan Pe- ninsula,	Timor.
18	<i>Hipposideros nobilis</i> , Gray.	Pinang, Malayan Pe- ninsula,	Amboyna, Timor, Java, Su- matra.
19	<i>Hipposideros vulgaris</i> , Gray.	Pinang,	Java.
20	<i>Hipposideros murinus</i> , Gray.	Pinang,	Southern Mahratta country, Nicobars.
21	<i>Hipposideros galeritus</i> , Can- tor.	Pinang,	

22	<i>Vespertilio adversus</i> , Horsfield ?	Pinang,	Java, Calcutta.
23	<i>Kirivoula picta</i> , Gray.	Pinang,	Borneo, Java, Sumatra.
24	<i>Kirivoula tenuis</i> , Gray.	Pinang,	Borneo, Java, Sumatra.
25	<i>Trilatitus Horsfieldii</i> , Gray.	Pinang,	Java, Sumatra.
26	<i>Scotophilus Temminckii</i> , Gray.	Malayan Peninsula and Islands,	Timor, Borneo, Java, Sumatra, Calcutta, Pondicherry.
27	<i>Pteropus edulis</i> , Geoffroy.	Malayan Peninsula and Islands,	Java, Sumatra, Banda, Bengal, Assam.
28	<i>Cynopterus marginatus</i> , F. Cuvier.	Malayan Peninsula and Islands,	Java, Sumatra, Southern Mahratta country, Bengal, Nipal.
29	<i>Tupaia ferruginea</i> , Raffles.	Pinang, Singapore, Malayan Peninsula,	Borneo, Java, Sumatra.
30	<i>Gymnura Rafflesii</i> , Vigors and Horsfield.	Malayan Peninsula, Singapore,	Sumatra.
31	<i>Sorex murinus</i> , Linné.	Pinang,	Java, Sumatra.
32	<i>Helarctos malayanus</i> , Horsfield.	Malayan Peninsula,	Sumatra, Tenasserim, Assam, Nipal.
33	<i>Arctictis Binturong</i> , Fischer.	Malayan Peninsula,	Arracan, Tenasserim, Assam, Nipal, Bhotan.
34	<i>Putorius nudipes</i> , Fred. Cuvier.	Malayan Peninsula,	Borneo, Sumatra.
35	<i>Mustela flavigula</i> , Boddaert.	Malayan Peninsula,	Java, Sumatra, Nipal.
36	<i>Lutra Nair</i> , F. Cuvier.	Malayan Peninsula,	China, Bombay, Southern Mahratta country.
37	<i>Lutra Barang</i> , Raffles.	Malayan Peninsula,	Borneo, Sumatra.
38	<i>Aonyx leptonyx</i> , Gray.	Malayan Peninsula, Singapore,	Java, Sumatra, Nipal.
39	<i>Cuon primævus</i> , Hodgson.	Malayan Peninsula,	Bengal, Nipal.
40	<i>Viverra Zibetha</i> , Linné.	Pinang, Singapore, Malayan Peninsula,	Southern China, Siam, Bengal, Khasyah Hills, Nipal.
41	<i>Viverra Tungalunga</i> , Gray.	Pinang, Singapore, Malayan Peninsula,	Amboina, Celebes, Borneo, Philippine Islands, Sumatra.
42	<i>Viverricula malaccensis</i> .	Malayan Peninsula, Singapore,	China, Philippines, Java, Cochinchina, Tenasserim, Bengal, Nipal, Hindoostan, Dukhun, Bombay.
43	<i>Prionodon gracilis</i> , Horsf.	Malayan Peninsula,	Borneo, Java, Sumatra.
44	<i>Paguma leucomystax</i> , Gray ?	Malayan Peninsula, Singapore,	Sumatra.
45	<i>Paguma trivirgata</i> , Gray.	Malayan Peninsula, Singapore,	Moluccas, Tenasserim.

46	<i>Paradoxurus musanga</i> , Gray.	Pinang, Singapore, Malayan Peninsula,	Timor, Borneo, Java, Sumatra.
47	<i>Paradoxurus Derbyanus</i> , Gray.	Malayan Peninsula,	Borneo.
48	<i>Cynogale Bennettii</i> , Gray.	Malayan Peninsula,	Borneo, Sumatra.
49	<i>Herpestes javanicus</i> , Desmarest.	Penang, Malayan Peninsula,	Java.
50	<i>Herpestes auropunctatus</i> , Hodgson.	Malayan Peninsula,	Bengal, Nipal, Scinde, Afghanistan.
51	<i>Herpestes griseus</i> , Desmarest.	Malayan Peninsula,	Bengal, Hindoostan, Scinde, Nipal.
52	<i>Herpestes brachyurus</i> , Gray.	Malayan Peninsula.	
53	<i>Felis tigris</i> , Linné.	Malayan Peninsula,	Ceylon, India.
54	<i>Felis leopardus</i> , Schreber.	Malayan Peninsula,	India.
55	<i>Felis marmorata</i> , Martin.	Malayan Peninsula.	
56	<i>Felis javanensis</i> , Desmarest.	Pinang, Malayan Peninsula,	Java, Sumatra ?
57	<i>Felis planiceps</i> , Vigors and Horsfield.	Malayan Peninsula,	Borneo, Sumatra.
58	<i>Felis domestica</i> .		
59	<i>Sciurus bicolor</i> , Sparrm.	Pinang, Malayan Peninsula,	Borneo, Java, Sumatra, Siam, Tenasserim, Assam, Nipal.
60	<i>Sciurus Rafflesii</i> , Vigors and Horsfield.	Malayan Peninsula,	Borneo, Java, Canton Province.
61	<i>Sciurus hippurus</i> , I. Geoffroy.	Malayan Peninsula,	Java, Sumatra, Assam, Canton Province.
62	<i>Sciurus vittatus</i> , Raffles.	Pinang, Singapore, Malayan Peninsula,	Borneo, Java, Sumatra, Canton Province.
63	<i>Sciurus nigrovittatus</i> , Horsfield.	Malayan Peninsula,	Borneo, Java, Sumatra, Canton Province.
64	<i>Sciurus tenuis</i> , Horsfield.	Malayan Peninsula, Singapore,	Borneo, Java, Sumatra, Canton Province.
65	<i>Sciurus laticaudatus</i> , Diard. Var.	Malayan Peninsula.	
66	<i>Pteromys nitidus</i> , Geoffroy.	Pinang, Singapore, Malayan Peninsula,	Borneo, Java, Sumatra.
67	<i>Sciuropterus Horsfieldii</i> . Waterhouse.	Malayan Peninsula,	Java ? Sumatra ?
68	<i>Sciuropterus genibarbis</i> .	Malayan Peninsula,	Java.
69	<i>Mus bandicota</i> , Bechst.	Pinang, Malayan Peninsula,	Southern Mahratta country, Bengal, Nipal.
70	<i>Mus decumanus</i> , Pallas.	Cosmopolita.	

71	<i>Mus setifer</i> , Horsfield.	Pinang,	Borneo, Java, Sumatra, Van Diemen's Land.
72	<i>Mus rufescens</i> , Gray.	Pinang,	Dharwar, Madras, Bengal, Arracan.
73	<i>Mus musculus</i> , Linné?	Pinang,	
74	<i>Rhizomys sumatrensis</i> , Gray.	Malayan Peninsula,	China, Moulmein, Assam.
75	<i>Hystrix longicauda</i> , Marsden.	Malayan Peninsula,	Borneo, Java, Sumatra.
76	<i>Atherura fasciculata</i> , Cuv.	Pinang, Malayan Peninsula,	Borneo, Java, Sumatra.
77	<i>Manis javanica</i> , Desmarest.	Pinang, Malayan Peninsula,	Borneo, Java, Sumatra.
78	<i>Elephas indicus</i> , Linné.	Malayan Peninsula,	Borneo, Burma, Siam, India, Ceylon.
79	<i>Sus indicus</i> , Schinz.	Pinang, Singapore, Lancavy, Malayan Peninsula,	Bengal, Nipal, Southern Mahratta country.
80	<i>Sus scrofa</i> , Var. Linné.	Malayan Peninsula and Islands,	China.
81	<i>Rhinoceros unicornis</i> , Linné.	Malayan Peninsula,	Bengal, Assam, Nipal.
82	<i>Rhinoceros sondaicus</i> , Cuv.	Malayan Peninsula,	Java.
83	<i>Rhinoceros sumatranus</i> , Raffles.	Malayan Peninsula,	Sumatra, Tenasserim.
84	<i>Tapirus malayanus</i> , Raffles.	Malayan Peninsula,	Borneo, Sumatra.
85	<i>Equus caballus</i> , Linné.	Introduced in the Malayan Peninsula and Islands.	
86	<i>Tragulus Kanchil</i> , Gray.	Pinang, Singapore, Lancavy, Malayan Peninsula,	Java, Sumatra.
87	<i>Tragulus javanicus</i> , Pallas.	Malayan Peninsula,	Borneo, Sumatra, Java.
88	<i>Styloceros Muntjak</i> , Ham. Smith.	Malayan Peninsula,	Borneo, Banka, Java, Sumatra, Tenasserim, Nipal, Assam, Bengal, Southern Mahratta, Dikhun.
89	<i>Axis maculatus</i> , H. mith.	Malayan Peninsula, Pinang,	Sumatra, Bengal, Assam, Nipal, Southern Mahratta country, Ceylon.
90	<i>Rusa equina</i> , H. Smith.	Pinang, Malayan Peninsula,	Borneo, Sumatra.
91	<i>Panolia acuticornis</i> , Gray?	Malayan. Peninsula,	
92	<i>Nemorhedus sumatrensis</i> , Ham. Smith.	Malayan, Peninsula,	Sumatra, Tenasserim.

93	<i>Bos gour</i> , Trail.	Malayan Peninsula,	Tenasserim, Hindoostan, Assam, Nipal, SouthernMaharatta country.
94	<i>Bos taurus</i> , <i>Var. indicus</i> , Lin.	Introduced in the Malayan Countries.	
95	<i>Bubalus arnee</i> , H. Smith.	Ditto.	
96	<i>Halicore indicus</i> , F. Cuv.	Singapore, Malayan Peninsula,	Philippines, Moluccas, Sunda Islands, Sumatra, New Holland, Red Sea.
97	<i>Delphinus plumbeus</i> , Dussumier.	Malayan Seas,	Bay of Bengal.

Note to GEN. NYCTINOMUS, p. 9. A male *Nyctinomus bengalensis*, Geoffroy, (*Syn. Vespertilio plicatus*, Buchan.—*N. bengalensis*, Geoffroy, apud Horsfield.—*Dysopes plicatus*, Temminck, apud Schinz,) examined after the Catalogue had passed through the press, exhibited a true cæcum. The entire length of the animal was $4\frac{3}{8}$ inches, of which the tail measured $1\frac{5}{8}$ inch. Extent of the flying membrane: 1 foot $0\frac{4}{8}$ inch.

Length of the small Intestine, $9\frac{1}{8}$ inches.
 ,, ,, large ditto, $4\frac{1}{8}$,,
 ,, ,, cæcum, $0\frac{3}{16}$,,

The cæcum is crescent-shaped, with the concave curvature firmly adhering to the external surface of the small intestine. The convex curvature presents near the apex a sacculated appearance; the membranes are thickened. Where the cæcum joins, the small intestine and the rectum are narrowed.

Fort William: Dec. 11th, 1846.

Notices and Descriptions of various New or Little Known Species of Birds. By ED. BLYTH, Curator of the Asiatic Society's Museum.

[Continued from p. 54, *ante*.]

In the intervals that elapse between the publication of successive portions of these notices, it regularly happens that further collections are received by the Society, and that some additional information is derived from them relative to groups that had already been treated of. In the present instance, we have been indebted to Dr. R. Templeton, of Colombo, for two collections of birds from Ceylon, in which some interesting novelties have been comprised, and much information gained respecting the ornithology of that island, which of late years has been very little investigated. Among the species sent is a little Owl, which appears to be the true *Strix castanoptera* of Horsfield; one of three nearly allied Indian species, as follow:—

1. *Athene castanopterus*, (Horsf.): *Strix spadicea*, Reinwardt. Entire mantle and wings uniform deep chesnut-rufous, more or less obscurely barred with subdued dusky: primaries weak dusky, faintly banded with rufous on the inner web, and with a series of spots of bright rufous on the outer web: tail dusky, with eight or nine narrow white or whitish bars, the last of them terminal: head and neck closely barred with light rufescent on a dusky ground, and contrasting strongly with the rufous of the back: breast nearly similar, but the colours deeper; the abdomen white, with longitudinal dusky streaks; and the vent and lower tail-coverts pure white: bill pale yellow. Length of wing about five inches. Three specimens received are essentially quite similar, and a fourth is mentioned in XIV, 185. Inhabits Ceylon.

2. *Alh. malabaricus*, nobis: *Ath. castanopterus* apud nos, doubtfully cited in XIV, 134, and of Jerdon, *Madr. Journ.* No. XXXI, 320. Size of the preceding, or a little shorter in the wing: the head, neck, and interscapularies, uniformly coloured, of a lightish rufous with narrow and close dusky rays; wings the same, but the colours deeper, and the dusky bands considerably broader: primaries deep rufous, the three first barred throughout with dusky, the rest mostly immaculate (or with comparatively obscure bars) for the basal half, and distinctly barred for the remainder; secondaries with broad distinct bands throughout, rufous and dusky; and tertiaries with the scapularies

barred rufescent-whitish and dusky, the outermost scapularies having the large white spots (common to most Owls,) in general conspicuously developed: the lower-parts are barred throughout, dusky and white on the belly and flanks, rufous and dusky on the breast, except the vent and lower tail-coverts, which are spotless white; tail dusky, with eight or nine whitish bars, somewhat broader than those of the preceding species. This inhabits the Malabar Coast and Travancore; and the Society is indebted for specimens of it to Mr. Jerdon.

3. *Ath. radiatus*, (Tickell): *Ath. erythropterus*, Gould; *Noctua perlineata*, Hodgson; *N. cuculoides* (?) apud Jerdon, *Catal.* Upper-parts uniformly barred with close rays, rufescent-whitish and dusky; the wings more distantly barred with the same, but the rufous tinge deeper, and some of the greater coverts have, in general, conspicuous white spots; the great alars are still deeper rufous, barred with dusky throughout, and marked much as in the first species; lower-parts barred whitish and light dusky, and the under tail-coverts white as in the others. This species occurs in most parts of the country, as in the Himalaya, Upper and Central India, the eastern coast of the Peninsula, and Mr. Jerdon says "Travancore and Malabar;" but it is probable that he here refers to *Ath. malabaricus*, in which case the synonyme of *cuculoides* apud Jerdon, must be transferred. About Allahabad, as Dr. Stewart informs me, it is particularly numerous.

Although the first of these three species accords with the descriptions of *Ath. castanopterus* of Java, it may yet prove (upon comparison of specimens) to be an allied species rather than the same; but it would not be the only Malayan species that has turned up in Ceylon, and in no part of Continental India as yet: the same collection contained examples of *Vespertilio pictus*, (or *Kerivoula picta*, apud Gray,) perfectly identical with Javanese specimens; whereas, from Continental India, I have only seen a nearly allied species, which I presume to be *Kerivoula Sykesi* of Gray. The curious Bittern, *Tigrisoma melalophos*, (Raffles,) is sent from Ceylon, and this is new to the fauna of cis-Gangetic India, though the Society has received it from Arracan: *Ephialtes lempiji* of Ceylon and Malabar is again identical with the species common throughout the Malay countries; but it has been erroneously identified with *Eph. lettia*, (Hodgson,) or the closely allied (if different) *Eph. lettioides* v. *griseus* of Jerdon. *Athene castanopterus* I have never seen

from the neighbourhood of the Straits, but Helfer (a very unsafe authority) mentions it to inhabit the Tenasserim Provinces. Probably the *Ath. badius*, Hodgson, from Nepal, mentioned in Mr. G. R. Gray's Catalogue of the British Museum *Raptores*, but as yet (I believe) undescribed, pertains to the same little sub-group.

In p. 12, *ante*, I suggested that *Bucco zeylanicus*, Gmelin, founded on the "Yellow-cheeked Barbet" of Brown's illustrations, would probably be found to differ from *B. caniceps*, Franklin, which Mr. Jerdon had assigned to *zeylanicus*. There is now more reason to incline to that naturalist's opinion, as the *B. caniceps* is very common in Ceylon, being rather smaller, on the average, than specimens from Upper India, as indeed are those of the Peninsula generally, so far as my observations have hitherto gone.

The *Picus ceylonus*, Forster, mentioned in a note to p. 18 *ante*, is a true *Brachypternus*, which appears to be as common in Ceylon as *Br. aurantius* is in India generally: and as there can be no doubt of its specific distinctness, any more than of the distinctness of *Tiga Rafflesii* (p. 16, *ante*.) from *T. tridactyla* and its immediate allies, this fact of the existence of a plurality of decided species of these types—of an undeniable repetition of their peculiar and marked characters—adds much to the probability of the more closely allied species—*Br. micropus* (XIV, 194), *Br. dilutus* of Scinde (XIV, 550),—*T. Shorei*, (Vigors), and *T. intermedia* (XIV, 193), being also severally distinct from and not mere local varieties of *Br. aurantius* and *T. tridactyla*. Other examples of this close affinity occur in *Micropternus badius*, *M. phaeiceps*, and *M. gularis*; and Mr. Jerdon, in the third No. of his 'Illustrations of Indian Ornithology', has contended that his *Hemicercus cordatus* is probably an analogous representative of *H. canente*, (Lesson), of the countries of the eastern side of the Bay of Bengal. That he is right in this conjecture is not improbable; though the two are absolutely similar in structure, colouring, and markings: but the South of India species appears to be constantly smaller than its representative on the opposite side of the Bay. Mr. Jerdon gives the length of wing of the former as three inches and three-quarters, that of a female in the Society's Museum being only three inches and a half; but of several specimens received from Arracan and Tenasserim, the length of wing of the males averages four inches, and of the females three and three-quarters; the latter being conspicuously larger than

the only South of India female that I have to compare them with. Small as this difference may seem, it is very perceptible in the general size of the birds; and ornithologists will form their own opinion as to its value. In the *Hemilophus Hodgsoni*, Jerdon, the size of this species of Peninsular India, exceeds that of the nearly allied *H. javensis*, Horsfield, v. *leucogaster*, (Reinw.), of Tenasserim and Malacca. I might mention several more instances of the kind, but will merely observe that further observation has confirmed the propriety of separating *Caprimulgus albonotatus*, *C. macrourus*, and *C. mahrattensis*, (which last occurs in Ceylon,) these species scarcely differing but in size; also *C. monticolus* and *C. affinis*, but *C. arenarius* of Burnes' drawings seems merely to be the nestling plumage of *C. monticolus*, to judge from a specimen of the latter with which the Society has been recently favoured by Dr. Stewart. To return to the Woodpeckers, *Gecinus chlorigaster* (*ante* p. 16,) is an inhabitant of Ceylon; and this species, though well distinguished in the colouring of its occiput more particularly, is as closely allied to *G. chloropus*, as mutually are many of the approximate races to which I have been adverting.

Simotes albivertex, nobis (*ante* p. 19,) is not from Borneo, but from an islet off the coast of Waigou: and so likewise is the *Carpophaga* with knobbed bill, referred to the 'Sumatra Pigeon' of Latham in XIV, 857; while the small *C. ænea*, supposed to be from the same region (*loc. cit.*), proves to be from the Neilgherries. What further information I have obtained on the *Columbidæ* may be reserved till their turn arrives: but in reference to the remark in a note to XIV, 846, that perhaps some of the *Gourinæ* may prove to have more than twelve caudal rectrices, I may here mention that *Goura* (v. *Lophyrus*), and also the great *Phaps* group of Australia (including *Leucosarcia*, if not also, as I suspect, *Ocyphaps* and *Petrophassa*), possess fourteen—as in *Treron*, *Carpophaga*,* and *Ptilinopus*; while *Chalcophaps*, and apparently *Peristera*, have only twelve. Of three specimens of *Calænas nicobaricus* in the Society's Museum, all have the tail imperfect; and it is curious that

* The curious Australian Pigeon, *Lopholaimus antarcticus* (v. *Col. dilopha*, Tem.,) which in XIV, 885, I suggested was probably a subgeneric form of *Carpophaga*, is allied rather (as I now find from inspection of specimens) to that *Carpophaga*-like group of true *Columbinæ*, having twelve tail-feathers only, which is referred to *Dendrotreron*, Hodgson, in p. 53 *ante*, but which will bear the prior name *Alsocomus* of Tickell, as *Col. punicea* must also be assigned to it.

the rectrices of this bird, which are pure white in the adult, are, in the young of the same, green-glossed black as the wing-primaries:— at least I presume the species to be the same, the Society's black-tailed young one being from the Nicobars, and one of the adults from the Cocos Isles (a group of rocks lying northward of the Andamans,) the other from the Malayan Peninsula.

Zanclotomus viridirostris, Jerdon, would seem to be a common species in Ceylon; thus confirming my suspicion (XI, 1096,) of its being Daniell's *Handee Kootah*, as well as the supposed Indian race (mentioned by Levaillant) of *Serisomus cristatus* of Madagascar.

Captain Tickell has favoured me with the following description of a new Spiny-tailed Swift:—

“*Acanthylis sylvatica*, Tickell. Entire length, from tip of bill to end of tail, four inches and a fifth; wing from shoulder to tip four inches and a half, and reaching an inch and a half beyond the tail. Form typical: the details being as in *Ac. nudipes*, (Hodgson). Wiry-tips to the shafts of the rectrices well developed—sharp and stiff. Thumb versatile but opposite (as in *Ac. nudipes*, of which I killed a fine specimen at Darjeeling*). Colour—Bill, iris, and legs, black. Rictus, auriculars, chin, throat, and breast, iron-grey, with a dash of ashy-brown. Belly pure white, the feathers black-shafted. All the upper-parts black, with dull blue metallic reflections. Remiges brownish-black: tail and its shafts black. Across the lower back passes a broad defined space of white, including in fact the whole rump, but not the upper tail-coverts which are of the same colour as the upper-parts generally.

“I shot a specimen of this bird so far back as Nov. 1835. It haunts open cultivated ground in the midst of forest; also the cleared patches on the sides and summits of the hills [in Central India]. Is common, but local; gregarious and noisy: being often seen in company with *Cypselus melba*. When my duties call me next into the wooded regions of my jurisdiction, I will do my best to shoot some specimens and send you the dried skins, as vouchers for the above description.”

Psilorhinus, p. 27, ante. Lord Arthur Hay mentions, in *epistola*, —“It is very curious that though the Red-billed Jay is found alone at Simla, I should have procured only the Yellow-billed one after leaving

* Mr. Bartlett informs me that he had lately seen a specimen of this Himalayan bird shot in England, at or near Colchester, in Essex.—E. B.

Jummoo, and in Cachemere." His lordship's description of the latter identifying it with *Ps. flavirostris* of Darjeeling, while by the "Red-billed" he probably means *Ps. occipitalis*.

Gracula, p. 31, *ante*. Two species of this genus inhabit Ceylon: one, the *Gr. religiosa* (apud nos), of southern India,*—the other new, which may bear the name

Gr. ptilogenys, nobis. This has no bare skin on the cheek, but the occipital lappets are well developed, and the basal half of the lower mandible is black: bill moderately strong. Length of wing six inches. Colouring as in the others.†

Amadina, p. 36, *ante*. The *A. malacca*, or "White-breasted Indian Sparrow" of Edwards, common in Southern India, occurs rarely in Bengal, mingled in flocks of *A. sinensis*, or the "Chinese Sparrow" of Edwards; from which, indeed, it only differs in having the lower-parts pure white, with the same abdominal black patch: and it is curious that a third race inhabits the Malayan peninsula, similar to *A. sinensis*, excepting in having no black patch on the abdomen; whence the name *malacca* is ill applied to the white-bellied bird of Peninsular India.‡

* Mr. Jerdon designates this *Gr. minor* (*Madr. Journ.* No. XXXI, 134): but if it be not admitted as *Gr. religiosa* (vera), as it is certainly the *Eulabes indicus* of Cuvier, it would therefore rank as *Gr. indica*.

† Add, as a synonyme to *Sturnia pagodarum*, the *Turdus melanocephalus*, Bahl (nec Gmelin), *Trans. Nat. Hist. Soc. Copenhagen*, 1792.—*Emberiza bruniceps*, Brandt, = *E. icterica*, Eversham; and *Coccothraustes speculigerus*, Brandt, is probably no other than *C. carnipes*, Hodgson.

‡ Immediately as the above was consigned to press, Mr. R. W. G. Frith kindly allowed me the pickings of an extensive Malayan collection just received, wherein are four species of *Amadina*, comprising one that I have been unable to identify. The Malayan peninsula yields, at least, the following six species of this genus of Finches.

1. *A. oryzivora*, (L.), which deviates a little from the type of all the rest.
2. *A. maja*, (L.): *Loxia leucocephala*, Raffles: *L. ferruginosa*, Latham; whose *L. bicolor* is probably the young.
3. *A.* — ? The race resembling *A. sinensis*, except in wanting the black patch on the abdomen.
4. *A. punctularia*, (L.): *Fringilla nisoria*, Tem. Distinguished from *A. undulata*, (Lath.), v. *Munia lineoventer*, Hodgson, of India, by the whitish grey on the rump, upper tail-coverts and tail, which is represented by glistening fulvous in the other.
5. *A. molucca* (?), v. *Munia acuticauda*, Hodgson, which is doubtless Mr. Jerdon's supposed *A. striata* (v. *leuconota*, Tem.) of the Malayan peninsula. This agrees pretty well with Latham's description of *A. molucca*, except that the striation of the upper-parts is not mentioned; Griffith adds, however, "rump, and under breast, cross-barred, black and white." The belly in the Malacca species is pencilled with dusky, but not the white patch over the rump. Mr. Hodgson's Nepal specimens merely differ in

Certhilauda, p. 41, *ante*. My suggestion that Mr. Jerdon had sent me a distinct species as his *Alauda deva*, turns out to be well founded: the *A. deva* of his catalogue is a *Certhilauda* which I have not seen yet; and he has recently again obtained the true *Alauda* with pointed crest, referred by me to *A. malabarica* in XIII, 962.

In XIII, 567, it is remarked, that I had not actually compared Malayan with Bengal specimens of *Pycnonotus jocosus*, but had an impression that the crimson sub-ocular tuft is considerably less developed in the former. Dr. Cantor's rich collection from the Malayan peninsula comprises several specimens of the bird in question, which is common at Penang; and it is remarkable that the crimson sub-ocular tuft does not attain to a third of the length which it does in Indian specimens. In fine examples of the latter, the longest of the hair-like plumes composing this ornamental tuft, measure above five-eighths of an inch, passing considerably beyond the extremities of the white ear-coverts, and impending their upper half; while in equally fine specimens of the Malayan bird, they appear as if truncated, and impend only the basal third of the white ear-coverts: in other respects the two birds exactly resemble; as does likewise the *P. monticolus*, (McClelland and Horsfield,) from the mountains of Assam, which is described to have "a scarlet ring about the eye, but no tuft beneath this organ." This, and the *Amadina malacca* group, are accordingly further exemplifications of that repetition in different districts of the *Fauna Indica*, of the same specific types with merely a variation of size, or some trivial but constant difference of colouring, or (as in the *Pycnonotus jocosus* group) a variation in the form or degree of development of an ornamental tuft: the specific value

being somewhat paler, and what white remains on the rump appears to be a little striated; but they are in very bad condition. *A. striata*? (v. *leuconota*?) of India accords with Latham's description, except that the white on the rump is not mentioned. Its upper-parts, and those of *A. molucca* (?) of the Malayan peninsula, are nearly similar; but the lower are very different: the Indian (and Arracan) bird having the throat to breast inclusive, uniform blackish, and the belly, vent, and flanks, white; whereas the Malacca bird has the chin and throat only blackish, the breast dark brown, with whitish shafts and borders to the feathers, and the belly dull white, with dusky pencillings.

6. *A. leucogastra*, nobis, *n. s.* (?). Size and proportions of *A. punctularia*, having the upper-parts throughout dark brown, with whitish shafts to the feathers more or less developed; throat, breast, and flanks, brown-black; the lower tail-coverts quite black; and belly white, narrowing to a point in front: margins of tail-feathers yellow-fulvous: bill and feet blackish in the dry specimens. Individuals vary in the intensity of their colouring.

of which differences will probably be ever a subject of dispute. Analogous slight differences occur in certain of the mammalia, reptiles, fishes, and insects, of the same regions, which are variously set down as allied species, or local varieties of the same, as the opinions of individual naturalists vary: but if the distinctness of such races be not admitted, there is no demarcating the line between them and what are conceded on all hands to be allied but distinct species, as every grade of approximation is abundantly manifested.*

Rubigula gularis, XIV, 576. This bird is figured by Mr. Jerdon, in the third No. of his 'Illustrations of Indian Ornithology;' and besides the ruby throat, it is both represented and described to have a black chin-spot, and the tail is represented as greenish like the back. The following, however, may yet prove to be the female. Length about six inches and a half; wing two inches and seven-eighths; tail two and three-quarters: bill to gape three-quarters of an inch, and tarse five-eighths. Colour olive-green above, below yellow throughout, sullied with greenish

* The opposite opinion is ably maintained by M. Schlegel, in his 'Essay on the Geographical Distribution of Serpents,' contained in Dr. Traill's abridged translation of Schlegel's great work on serpents: but that naturalist's hypothesis of climatal and local varieties carries him so far as to consider the Himalayan Jay (of course meaning *Garrulus ornatus*, v. *bispecularis*,) as a "variety" only of the European species; and he states—"The *Paradoxurus typus* is spread over Bengal, Siam, Sumatra, Borneo, Amboyna, Timor, &c., and forms, in these different places, numerous varieties, which are chiefly distinguishable by the tint and distribution of the colours, but sometimes also differ in size; in Sumatra, for example, the species is stronger than in Java; in Java than in Timor, &c.; there appears to exist in several places a variety with a white tip to the tail; and the individuals from certain parts of the island of Java have a pale yellow fur, with three stripes down the back." Now this amounts, in fact, to a reduction of all species that are nearly allied, to the rank of varieties only of the same one, however different their locale; and so far as climatal or local influence is concerned, it happens that several of the supposed "varieties" of *Paradoxurus typus* co-exist abundantly in the Malayan peninsula, and without intermingling so far as I have ever seen or heard of, which there can be little doubt they would do freely, were they really the same. The white tail-tip is of no consequence whatever, and occurs not unfrequently in several species of *Paradoxurus*, without affecting their other distinctive characters: white feet are also common, and occasionally these animals are largely pied with white also upon the body. If the different races of *Paradoxuri* inhabiting the Malayan peninsula are not to be regarded as *species*, all discrimination of species is at an end; no two naturalists will agree respecting the amount of specific variation; and no confidence can be reposed in any list of names representing the fauna of a region. Therefore, (at all events in the present state of knowledge,) I think it right to distinguish species or permanent races to the fullest practicable extent; and I even do not see that identity of origin is implied by absolute similarity.

on the breast and flanks: cap and ear-coverts black, but no black chin-spot: the tail dusky or blackish, laterally edged with green towards its base; its four outer feathers having a largish white spot at tip, and the two central pairs being successively more narrowly tipped with the same. Bill and feet black. From Ceylon. If new, *R. aberrans*, nobis; but I repeat my suspicion of its being the female of *R. gularis*.

Genus *Calamoherpe*, Boie. In my notice of the Indian species of this genus, XIV, 594, I cited *C. arundinacea*, (Lin.), with a mark of doubt, in referring to it the *Agrobates brunnescens* of Jerdon. By the kindness of H. E. Strickland, Esq., the Society has now been favoured with a specimen of the European bird, which proves, though very closely allied, to be certainly a distinct species from its Indian representative. It is rather larger, with a longer wing, the latter measuring above three inches and three-quarters; and a good distinction is afforded by the European bird having its first primary somewhat longer, if anything, than the next; whereas the Indian species, which will now rank as *C. brunnescens*, (Jerdon,*) has the first primary constantly three-sixteenths of an inch shorter than the next, the third being, if anything, longer than the second: the general colouring of the European species is also rather more intense, and especially the russet hue of the flanks abdomen, and lower tail-coverts, is considerably more developed.

Another result for which we are indebted to the fine British collections just received from Mr. Strickland,—Mr. Kirtland, of the Ashmolean Museum, Oxford,—Mr. Bartlett, of London,—and Mr. W. Davison, of the Alnwick Museum,—is that the British Nuthatch is a different species from that bearing the same name of *Sitta europæa* in Norway, which latter Scandinavian bird is doubtless the true *S. europæa* of Linnæus. The Norwegian Nuthatch has the whole under-parts white, with the exception of the deep russet hue of the flanks and variegating the lower tail-coverts, which is the same in both species.† In other respects they resemble; but the difference is as marked as between various acknowledged species of *Budytes*, or the *Motacilla alba* and *M. Yarrellii*, &c.;

* Provided, however, that it also proves distinct from *C. olivetum* (? or *olivarium* ?), Strickland, another allied species which that gentleman procured in Greece, and which is figured in Gould's 'Birds of Europe;' but no description of Mr. Strickland's bird is here accessible.

† Some specimens have an exceedingly faint tinge of fulvous on the abdomen only.

and a Himalayan Nuthatch is equally approximate (*S. cinnamoventris*, nobis, considered to be probably the *S. himalayana*, J. & S., in XIV, 579), this having merely the deep russet of the flanks spread over the whole under-parts of the male, and similarly diffused but much paler in the female,—the chin and sides of the throat below the ear-coverts being alone white, except the white variegation of the lower tail-coverts in which it resembles the two allied European species under consideration; another very slight distinction of this Himalayan Nuthatch appears also to be constant, namely that the outermost tail-feather has either no white, or the merest trace of white, on its exterior web: but its affinity with the two western European species is so close, that if the latter are held to be varieties of the same, so also must the Himalayan bird, notwithstanding that its deep ferruginous hue is as much developed as in *S. castaneoventris*, though still not so dark as in that smaller and slender-billed species of the hilly parts of India generally. Referring to the notice of *S. europæa* in the *Dict. Class.*, I observe that the British Nuthatch is there described, and hence infer that it is the species inhabiting France; the Scandinavian bird being probably confined to the north of Europe: and presuming that the latter is true *S. europæa*, Lin., I propose for the British species the name *Sitta affinis*.*

Passing now to groups which have not yet fallen under review, I shall commence with that which should have received the name

Muscicapidæ. The Flycatchers (*Muscicapidæ* of authors) are an assemblage from different natural families of birds, many of which are little connected by the physiological proximity we style *affinity*, but by *analogy* rather, or similarity of external adaptations to a particular mode of life. A large proportion of those of the Old World appertain strictly to the great group, branching off from the Thrushes, which is now currently known by the name *Saxicolinæ*. Of these I have many species to describe; but the group under consideration is altogether distinct from the Flycatching *Saxicolinæ*, and though the different

* It has lately been suggested to me that *S. nipalensis*, Hodgson, is identical with the British Nuthatch; but it is a widely different species, distinguished by its much smaller size, proportionally very short bill, and by the belly, flanks, vent, and lower tail-coverts, being uniform light ferruginous: in some (males?), the throat and fore-neck are white, passing laterally into pale buff; while in others (females?), a light buffy tint pervades the whole throat and fore-neck. The two outermost tail-feathers only, on each side, are marked with white.

Indian genera have all the *Muscicapa* adaptations fully developed, it branches off to such forms as *Piezorhynchus* and *Monarcha* of Australia, wherein those particular adaptations are much reduced. At the head of the group may be placed the *Tchitreæ*; nearly allied to which are the *Myiagræ* of Swainson, as exemplified by *M. cærulea*, (Vieillot), of India (which is *Musc. occipitalis*, Vigors, and the female—*M. cæruleocephala* of Sykes, nec *M. cyanocephala*, Gm., and ‘Azure-headed Flycatcher’ of Latham.)* As seen alive, or in the recent state, the approximation of *Myiagra cærulea* to *Tchitreæ paradisi* is extremely close: there is a near resemblance in general structure; the same delicate blue bill, which loses its colour a few hours after death; and the lengthened occipital crest of the Paradise Flycatcher is represented by the short velvety occipital tuft of the other, the plumelets of which are similarly erected: even the black pectoral cincture of *Myiagra cærulea* defines the boundary of the black throat and fore-neck of *Tchitreæ paradisi*. Allied to these, again, we have *Leucocerca*, Sw.† (the Indian species of which are referred to true *Rhipidura* in XII, 935): and *Rhipidura* (vera), v. *Chelidorhynx*, Hodgson, XII, 936, almost equally allied to *Leucocerca* and *Cryptolopha*, shews that the last-named genus comes also under the present series. The Indian *Cryptolopha* is *Musc. griseo-capilla*, Vieillot, (apud Griffith, *An. Kingd.* VI, 343,) and was figured by Mr. Swainson as *Platyrrhynchus ceylonensis*, afterwards altered by him to *Cryptolopha poiocephala*. It is also *Muscicapa nitida*, var A, of Latham. Its real name will therefore be, I believe, *Cr. griseocapilla*.

* The type of this genus is *M. plumbea*, the male of which=*Muscicapa leucogastra*, nobis, XIII, 336, and the female is the supposed female of my *M. rubecula*, *loc. cit.*, which=*Myiagra rubeculoides*, Vigors and Horsfield: but the supposed male of my *M. rubecula* would seem to be the female of another species, to which may probably also be referred the *Platyrrhynchus rufiventris* of Vieillot. That I did not recognise the *Myiagra plumbea*, was owing to the overcoloured figure of this bird in both editions of Lewin’s work.

† The name *Leucocerca* is not felicitous, as shewn by Mr. Swainson’s own *L. laticauda*, “remarkable for its broad and perfectly black tail.” (*Nat. Libr.*, ‘Flycatchers.’) The Society has also a species from Java or the Moluccas, with a wholly rufous tail. The common species of Lower Bengal, *L. fuscoventris*, (Franklin), was subsequently named *Musc.* (*Rhipidura*) *sannio*, by M. Sundevall; and Mr. Strickland, in referring the latter appellation to Franklin’s species, erroneously adds *L. pectoralis*, Jerdon, as a synonyme. *L. fuscoventris* is the ‘Broad-tailed Flycatcher’ of Latham, and *L. albifrontata*, the ‘White-browed Flycatcher’ of that author.

This bird is generally distributed over all India, from the Himalaya to Ceylon, and it is common enough in mango groves in Lower Bengal.

Of the *Tchitreæ*, I am acquainted with three Asiatic species which have the middle tail-feathers elongated, and the *Muscipeta atrocaudata* of Eyton is perhaps a fourth.

1. *Tch. paradisi*, (L.), the fully mature bird : *Muscicapa indica*, Stephens, and *M. castanea*,* Tem., the once moulted bird.† It is not at all uncommon to get specimens of this bird in a transitional state of plumage, variously intermediate to the phases above referred to ; and not merely when moulting from the rufous to the white garb, but a variously intermediate dress is occasionally put forth. Thus, among a number of specimens before me, one white male has a considerable intermixture of rufous on many of its back and rump feathers : another is almost unmixed rufous above, and pure white below ; some of the upper tail-coverts are white, and there is a streak of the same on one of the middle caudal feathers : a female is very similar to the last, but has one primary on each wing—and not the corresponding feathers—white-edged : another and remarkably fine rufous male has a single white dorsal feather only : and another again has only a single outermost caudal feather chiefly white, with a black outer margin. Females do not appear to assume the white dress until they are several years old ; and it is usual, therefore, to see a white male paired with a rufous female : but, in general, the females have the whole neck and throat glossy-black, like the male, though in some the lower portion of the black passes into grey, and rarely the whole throat is ashy, with the lower half of the neck behind. In adults of either sex, the crest-feathers appear never to be under an inch in length, and vary from that to one and a quarter : but the nestling-bird is crestless, and has the head of a pale dull chesnut, with the clothing feathers altogether extremely downy and unsubstantial. Lastly, the black exterior margin to the caudal feathers occurs only in the white or fully mature livery, and the elongated central tail-feathers are never thus margined (as in the next species), but have a black shaft for about half their length. This species is more or less common throughout India, from the Himalaya to Ceylon.

* Perhaps, however, this name belongs rather to the next, or common Malayan, species.

† *Musc. mutata* of India, Lath., can only refer to the same.

2. *Tch. affinis*, A. Hay, MS.: Malayan *Tch. paradisi*, auctorum; *Muscipeta castanea* (?), Temminck. In any state of plumage, this species may be distinguished from the last by having the crest never more than seven-eighths of an inch in length (generally less), and the feathers which compose the crest are broader and *much more commingled* into a uniform smooth surface than in the other. The middle tail-feathers of the male rarely, if ever, attain a foot in length; whereas in the Indian species, they often exceed fifteen inches; in form, too, they are very much narrower than in *Tch. paradisi* (vera). The adult male is white, with glossy-black head and neck, as in the other; but the black on the shafts of the feathers of the upper plumage generally, is much more developed; and the middle caudal feathers are black-shafted *throughout their whole length*, or nearly so, and are more or less conspicuously margined *throughout, both externally and internally*, with black, often broadly so throughout. A mature female received from Malacca is wholly white, with black head and nape, and black centres of feathers and edges of caudals, as in the male; the caudals being however broad, instead of narrow as in the other sex. Young males in the chesnut plumage seem never to have any black on the throat and fore-neck, which, with the nape, are wholly ash-colour, as in some young females of *Tch. paradisi*; these rufous males, and also the younger rufous females, have little or no trace of the black centres to the feathers,—but in older rufous females the latter are well developed on the tertiaries, and the ash-colour of the nape, throat, breast and flanks, is very dark*: the inner portion of the large alars, which in the corresponding plumage of the Indian species is commonly chesnut throughout, is in its Malayan relative always dusky black. This species is also smaller than *Tch. paradisi*. It is common in the Malayan peninsula the Tenasserim Provinces, and occurs rarely in Arracan; replacing *Tch. paradisi* of India Proper.

The advance from rufous to white occurs in several other species; as somewhat fantastically shewn in one or two of Levaillant's plates: and it is also instanced by Mr. Swainson's figure of his *Muscipeta rufiventris*, in the 'Birds of western Africa,' *Nat. Libr.*, wherein an admixture of white is exhibited upon the wing of a rufous specimen.

* The Society has one chesnut female with shining black throat and fore-neck, as commonly occurs in *Tch. paradisi*.

Tch. leucogaster, (Swainson), *Nat. Libr.*, 'Flycatchers,'—is an alleged species founded on (apparently) a female specimen, which was in the collection formed in India by the Countess of Dalhousie. It would seem to agree with *Tch. affinis* (in the rufous dress), except in its larger size, measuring "no less than five inches from the tip of the bill to the vent," and in having the posterior crest-feathers long and narrow, as in *Tch. paradisi*. If a true species, the form of the tail would indicate that the central caudal feathers of the male are elongated; which is not the case in all the genus, for instance in the small *Tch. borbonica* of the Isle of France, the general structure of which comes very close upon *Myiagra*.

Tch. atrocaudata, (Eyton), *P. Z. S.* 1839, p. 102. "*Toto corpore purpureo-atro, sed pectore imo abdomineque albis. Long. tot. 9 uncias.*" Hab. Malacca. Lord Arthur Hay possesses what I take to be a mature female of this species, having the head and neck glossy black, the rest of the upper parts beautiful glossy maronne, or deep chesnut-bay, with a very strong maronne gloss,—and of the lower-parts dark ash-colour, passing to white towards the vent and lower tail-coverts, which last are tinged with chesnut: shafts of the tertiaries black (as in *Tch. affinis*); and the primaries and secondaries dusky-black, margined externally with dark rufous; axillaries white: the central caudal feathers are scarcely developed beyond the rest; and the crest is still shorter than in *Tch. affinis*. Young females are scarcely distinguishable from those of *Tch. affinis*; but have a shorter crest, the middle tail-feathers about equal with the rest on either side, and more or less of the beautiful maronne gloss is generally perceptible. In this state of plumage, they constitute *Muscipeta atriceps*, nobis, XI, 203, 790.

Tch. princeps, (Tem.), *p. c.* 584. This superb species inhabits China and Japan. Lord Arthur Hay has received it from Hong Kong*: and I should acknowledge that I have been indebted to his lordship for the loan of some specimens of *Tch. affinis*, &c., which first enabled me to come to some understanding of these different species.

In immediate proximity to *Tchitrea*, we have the new genus *Philentoma* of Eyton, of which two species inhabit the Malayan peninsula:

* *Muscipetu atrocaudata*, Eyton?, apud Lord A. Hay, *Madr. Journ.* No. XXXI, 159. His lordship, however, does not agree with me in the above identification of his specimen with *Tch. princeps*. Perhaps *Tch. atrocaudata* may, indeed, yet prove to be no other than *Tch. princeps*.

viz. *Ph. pectorale* (*Muscicapa pectoralis*, A. Hay, *Madr. Journ.* No. XXXI, 161,) and *Ph. plumosum* (vide p. 10, *ante*): this is a genus which I had long instituted in *MS.*, when I found that I had been anticipated in publication by Mr. Eyton.

Dicruridæ. Drongos, or 'King Crows.' A very distinct group, one marked character of which is to have constantly but ten tail-feathers. An attempt was made to reduce the synonymes of the Asiatic species in XI, 799 *et seq.*; and Mr. Strickland made a further attempt in the *Ann. Mag. Nat. Hist.* 1844, p. 36. Mr. G. R. Gray, again, has more recently tried his hand at the whole series of them, and he adds the genera *Artamus* and *Irena* to his *Ampelidæ Dicrurinae*, in which I cannot think of following him. The generic subdivisions I would retain the same as formerly.

1. *Chibia hottentota*; *Corvus hottentotus*, Lin.: *Edolius barbatus*, Gray; *E. crishna*, Gould; *Criniger splendens*, Tickell; *Chibia casia*, Hodgson. Common in Bengal, Nepal, Assam, Sylhet, and in Central India; rarer in Arracan; and partially distributed in S. India. This beautiful bird is remarkable for the arched form of its bill, which is high and carinate at base, and attenuates gradually to a point, with scarcely a trace of emargination. It has a frontal crest of a few hair-like stems, which hang over the nape; and its outermost tail-feathers are very much twisted over, forming a singular ornament.

2. *Chaptia ænea*, (Vieillot): *Dicrurus æratus*, Stephens; *Ch. muscipetoides*, Hodgson; *Butchanga* of the Bengallees. This beautiful species resembles the last in the character and lustre of its feathers, but has the general form of a Flycatcher. It is a loud and very respectable songster. Inhabits India generally.

3. *Ch. malayensis*, A. Hay. Very similar to the last in plumage, but the size inferior, the tail much less deeply forked, the bill deeper, and a considerable development of the peculiar crest impending its base, of the next species. Lord Arthur Hay will describe it more particularly in the 'Madras Journal.' From Malacca.

4. *Bhringa remifer*, (Tem.): *Bh. tectirostris*, Hodgson; *Edolius rangonensis* apud Horsfield, from Assam. This is peculiarly a hill species, common in the eastern Himalaya, and extending to the mountains of Assam, Sylhet, and Arracan. It much resembles the preceding in the general character and lustre of its plumage, but has a nearly

square tail, with the stems of the outermost feathers excessively elongated beyond the rest, and barbed only for the terminal four inches (or thereabouts), nearly equally so in both webs, and this barbed portion is not twisted as in the following species; the stem, however, which is much smoother or more completely barbless than in the others, takes half a turn, so that the barbed tips remain vertical to the axis of the body, with the upper side inwards.

We come now to the *Edolii*, as I restrict this division: and are presented with a series of species closely allied in other respects, but shewing every gradation in the degree of development of frontal crest, from the total absence of such an ornament, to one flowing backward over the occiput. Their synonyme, as may be supposed, is much involved. All have a moderately furcate tail, with the stems of its outermost feathers prolonged and naked for a considerable space, and broadly barbed on the inner side towards the extremity; the stem however giving one twist, so that this inner web appears to be the outer one: in younger specimens, the inner side has conspicuously a short web throughout its length (which is considerably less than in mature birds), and the rudiment of this inner web is seen, upon close inspection, in adults, as also a very slight rudiment of an outer web, which latter becomes further developed towards the extreme tip of the feather. Finally, the barbed tip is more or less twisted inwards, and has always its inferior side uppermost. It is worthy of remark, that the crested birds are successively larger as the crest becomes more developed; while the crestless species are smallest: also, that the latter have the longest and most spirated outer tail-feathers; while in the former, these are successively shorter and less spirated.

5. *E. malabaroides*; *Chibia malabaroides*, Hodgson, *Ind. Rev.* 1837, p. 325: *Lanius malabaricus*, as figured by Latham and Shaw, but not *L. malabaricus* as described by Latham from Sonnerat: *E. grandis* apud nos, XI, 170, and *Ann. Mag. Nat. Hist.* XIV, 46. In this species, the frontal plumes attain a length of two inches and a half, and flow backward over and beyond the occiput. The hackles of the neck are also decidedly more elongated than in the others. Length of wing commonly six inches and three-quarters. Inhabits Nepal, Tipperah, and the Tenasserim Provinces.

6. *E. grandis*, Gould, *Proc. Zool. Soc.* 1836, p. 5: *E. bengalensis*, A. Hay, *MS.* Crest-feathers attaining to an inch and a half, or in very fine specimens a trifle more, and reaching to the occiput, but scarcely ever overhanging it.* Fine specimens are of equal size with the preceding race; though, in general, the present one is rather smaller. It is common in Assam and Arracan, and occurs in the Bengal Soonderbuns.

7. *E. paradiseus*; *Cuculus paradiseus*, Lin.: *Dicrurus platurus*, Vieillot; *Edolius retifer*, Tem.; *E. cristatellus*, nobis, XI, 171; *E. intermedius*, Lesson, apud G. R. Gray. This is the common species of the Tenasserim provinces, with crest generally from an inch to an inch and a quarter long, and the wing usually six inches and a quarter. It is not well distinguished from the last; but when a number of specimens are seen together, with a corresponding series of the Arracan bird, the average size and development of the crest-feathers of the present race is shewn to be inferior, and the tendency of the crest is always to curve back more abruptly.

Two specimens from southern India (locality not mentioned), with which the Society has been favoured by Mr. Jerdon, do not—at least that I can perceive—differ in any respect from the common Tenasserim race; but Mr. Jerdon informs me, that he possesses three *Edolii* from the Indian peninsula,—“one from Malabar, one from the Eastern Ghâts, and one from Goomsoor. This last (*E. orissæ*),” he adds, “has the bill much smaller than in *E. dentirostris* of the Eastern Ghâts. The Malabar species is crested, and therefore does not correspond with Sonnerat’s figure” below referred to.

8. *E. malabaricus*, (Scopoli), founded on *le Grand Gobe-mouche de la côte de Malabar* of Sonnerat: *E. rangonensis*, Gould. That two races even here remain to be distinguished is still my suspicion, one being the bird described as *E. rangonensis* in XI, 172, and represented in the plate to XI, 802, figs. 8 and 9; the other, the bird of Sonnerat, devoid of the slightest trace of a frontal crest, and of which (if I am not greatly mistaken) I saw a Singapore specimen in the collection of a French gentleman some time ago, who forwarded that collection to Paris be-

* Mr. Gould, in his description of *E. grandis*, states—“The recurved feathers of the upper part of the head measure *an inch and a half* in length.”

fore I had examined it more particularly, as it was my intention to have done. That such a crestless *Edolius* exists, however, in Peninsular India is extremely doubtful.*

In fine, I should not now be surprised if a most complete gradation of specimens from the *E. malabaroides* of Nepal, with frontal crest two inches and a half long, to the entirely crestless bird figured by Sonnerat, should prove to be obtainable (as we proceed southward) in the countries lying eastward of the Bay of Bengal; and such a gradation would, I think, be due to the intermixture of a succession of allied races, rather than to climatal or local variation of the same aboriginal race: such intermixture decidedly taking place between *Coracias indica* and *C. affinis*, and between *Treron phanicoptera* and *Tr. chlorigaster*, as also between the different Káldige Pheasants (as I shall take another opportunity of shewing)†. The *Edolii* of peninsular India, I am not yet sufficiently acquainted with.

9. *Dicrurus edoliformis*, nobis, *n. s.* This well marked species would seem to be a common bird in Ceylon. It much resembles the ordinary sub-crested bird of the Malayan peninsula, except that its tail is formed as in *D. macrocercus*, the caudal feathers being however somewhat broader. Three specimens are quite similar. Length of wing five inches and three-eighths, of middle tail-feathers five inches, the outermost an inch and a half, to an inch and three-quarters more; bill to gape an inch and three-eighths; and tarse an inch. The form of bill and plumage is as in *E. malabaricus*, the frontal crest being rather more developed than in the next species.

10. *D. viridescens*, Gould, *vide* XI, 173 and 802, figs. 10 and 11. Tail almost quadrate, with but a slightly furcate tendency. Both this and the preceding are, in fact, *Edolii*, with the outermost tail-feathers not prolonged as in that series of birds.

* Since the above was written, the Society has been favoured by Mr. E. Lindstedt with a fine specimen of an *Edolius* from Malacca, having a frontal crest half an inch in length; and I feel doubtful whether this and other Malacca specimens can be safely identified with the bird having very long and very spiral outer tail-feathers, noticed in the description of *E. rangonensis*, XI, 172, and the bill of which is figured at p. 802, nos. 8 and 9.

† *Corvus corone* and *C. cornix*, and *Motacilla lugubris* and *M. alba* (apud Temminck), afford similar cases of intermixture of wild races in Europe. The Society's Museum contains a specimen of what is certainly the hybrid between *Corvus corone* and *C. cornix*, received from Norway; and we have also the well known hybrid between *Tetrao urogallus* and *T. tetrix*, from the same country.

11. *D. balicassius*; *Corvus balicassius*, Lin.: *Oriolus furcatus*, Gmelin, apud G. R. Gray; *Bhuchanga annectans*, Hodgson; *Dicrurus affinis*, nobis, XI, 174; *Corvus afer*, Licht.; and *C. assimilis*, Bechst., apud G. R. Gray. Inhabits the Malay countries, and occurs also in Nepal.* The Australian species referred to this by Messrs. Vigors and Horsfield, is the *D. bracteatus*, Gould.

12. *D. macrocerus*, Vieillot: *Muscicapa biloba*, Licht.; *D. indicus*, Stephens, and also of Hodgson, *As. Res.* XVIII, described and figured in part II; likewise *Bhuchanga albirictus*, Hodgson, *Ind. Rev.* 1837, p. 326: *Edolius forficatus*, Horsfield (apud Strickland, *in epistolá*); *D. balicassius* apud Sykes and Jerdon, also apud nos, XI, 174; and *D. fingarh* apud nos (passim). The common *Fingarh*, or 'King Crow,' of India generally.

13. *D. longicaudatus*, A. Hay: *D. macrocerus* apud Jerdon, et nos passim: *Neel Fingarh* of the Bengallees; described in *Ann. Mag. Nat. Hist.* 1844, p. 46. Inhabits India generally, but is much less common than *D. macrocerus*.

14. *D. cærulescens*, (Lin.): *Lanius Fingarh*, Shaw: both founded on Edwards' figure. Described in *Ann. Mag. Nat. Hist.* 1844, p. 47. Not common in Lower Bengal.

15. *D. leucopygialis*, nobis, *n. s.* Similar to the last but smaller; the tip of the upper mandible (it would seem constantly) more produced; and the white confined to the lower tail-coverts, the abdominal region being merely somewhat paler than the breast. Length of wing five inches and three-eighths. This appears to be a common species in Ceylon.

16. *D. intermedius*, nobis, *n. s.* Also closely allied to *D. cærulescens*, but having no white whatever on the under-parts, which are darker than the throat and breast of *D. cærulescens*, and have a faint steel-blue gloss. The upper-parts are also glossed with steel-blue instead of steel-green. Length of wing five inches, of middle tail-feathers three and a half, and of outermost tail-feathers an inch and five-eighths more. From Penang. In general aspect intermediate to *D. cærulescens* and *D. longicaudatus*.

* Captain Lewis took a specimen at sea, when within a few leagues of one of the Nicobar Islands.

17. *D. cineraceus*, (Horsf.) :—*leucophæus*, Vieillot ;—*ceylonensis*, Stephens. Lord Arthur Hay has presented the Society with a Malacca example of this species. Its length, to tip of middle tail-feathers, is about ten inches, the outermost exceeding them by about an inch, and the tail-fork much divaricated ; wing five inches and three-quarters : bill as in *D. longicaudatus* and *D. cærulescens*, but less carinate above, especially towards its base : general plumage deep ash-grey, passing to blackish just over the beak, also on the exterior web of the outermost tail-feathers and on the wing-primaries ; ear-coverts, and around the eye, with the vent and lower tail-coverts, albescent grey : bill and feet black.

Respecting the remaining semi-described species of oriental *Dicruridæ*, I have no information to contribute.

Artamus, Vieillot : *Ocypterus*, Cuv. ; *Leptopteryx*, Horsfield. I do not range this very peculiar genus here from any belief in its affinity for the *Dicruridæ*, but simply because I have no idea where else to place it. It is chiefly an Australian group, though one species inhabits the Philippines, another Java, and a third occurs throughout India. This is the *A. fuscus*, Vieillot, and *Ocypterus rufiventer* of Valenciennes, referred to *O. leucorhynchus* in *P. Z. S.* 1839, p. 158. It is also the *Murasiny** *Chatterer*, and *Brown-coloured Swallow*, var. *A.*, of Latham. An allied form, the *Analcipus hirundinaceus*, Swainson, was erroneously assigned to India by that author.† *A. fuscus* has quite the same habits as the various Australian species observed by Gould : except that I could never hear of its *clustering* in the very singular manner stated of *A. sordidus* ; *i. e.* a number of them clinging together, like a swarm of bees, even to the size of a bushel-measure, pendent from a high and bare branch of a tree. In other respects, Mr. Gould's description of the habits of *A. sordidus* might be transferred to the Indian species. Wherever a high tree rises above its fellows, and projects a bare or dead branch commanding a wide view around, there may commonly be seen a party of these birds, one minute sitting together in a close row, anon sallying forth in quest of insects, and soon returning (each separately and independent of the movements of the rest,) to alight and perch together as before. Yet they are not very common,

* Mispelt *Murasing*.

† Vide p. 45, *ante*.

but the parties are met with here and there, sometimes at long intervals through a tract of favourable country; but wherever they are seen, a number of specimens may be procured with the greatest facility.

Laniadæ. Of the true Shrikes (*Lanius*), the following Indian species may be enumerated.

1. *L. lahtora*, Sykes; *L. excubitor*, var. C, Latham: *Doodea lahtora* ('Milky Shrike'), Hind. This differs from *L. excubitor* in having a narrow black frontal band, and in the secondaries having their whole inner webs, and a broad tip and margin to the terminal half of their outer webs, white. It does not seem to occur in Lower Bengal; nor have I seen it from the Himalaya, or from the countries eastward: but it is of general occurrence on the plains of Upper India and the Northern portion of the peninsula, extending to Scinde, and it is likewise found at Rajmahl.

There is a remarkable specimen in the Museum, with the habitat of which I am unacquainted, and which is probably not Indian: but it seems to be a new species, and as such may be here described:—

L. longipennis, nobis. A large grey Shrike, with a fine blush on the under-parts, a very broad black frontal band, and singularly long straight wings, having the first primary very short, and the second nearly as long as the third. It is, therefore, a *Lanius* of Vigors, as opposed to his *Collurio*; to which latter all the other Indian species belong, even *L. Hardwickii*. Length about eight inches and a half, of wing four and three-quarters, its first primary but seven-eighths of an inch; and middle tail-feathers three and three-quarters, the outermost three-quarters less: bill to gape seven-eighths; and tarse an inch. Upper-parts ash-grey, darker and less pure than in *L. excubitor* and *L. lahtora*, except over the rump; throat, middle of belly, and lower tail-coverts, white; the rest of the under-parts subdued white, with a roseate blush; broad frontal band to a level with the eyes, and streak comprising the ear-coverts, black; wings and tail dull black; the basal third of the primaries white, forming a wing-band; tertiaries slightly tipped with the same; and outermost tail-feathers wholly white, the penultimate with only a dark spot on its inner web, and a dark shaft, with a narrow contiguous stripe on its outer web, and the two next tail-feathers white at base and tip; the ante-penultimate more broadly so. Bill black, with white spot at extreme base of lower mandible; and legs brown-black.

The following is a series of allied species, certain of which have not hitherto been distinguished.

L. schach, Lin. : *L. bentet*, Horsfield, *Lin. Trans.* XIII, 144 ; Lesson, in Belanger's 'Voyage.' Length eleven inches or less, of wing four and one-eighth, and of middle tail-feathers five inches to five and three-quarters, the outermost an inch and three-quarters to two inches shorter. Head and neck ashy, passing to whitish on the vertex, tinged with rufous on the back, and passing to bright light rufous on the rump, upper tail-coverts, scapularies, and flanks : lower-parts delicate rufous-white, whitest on the throat and middle of belly : a very broad frontal band, and streak through the eyes, comprising the ear-coverts, deep black : wings also black, with rufescent-whitish margins to the tertiaries, and white edge anteriorly : and the tail black, with rufescent-white tips often obsolete on its middle feathers, and successively more developed to the outermost ; the two or three outside feathers merely blackish, and margined round with light rufescent, which colour predominates on the outermost feather of all. Described from three Chusan specimens, which seem to be identical in species with the Javanese bird. This is the largest species of the sub-group, and is particularly distinguished from the others by having the black band on its forehead fully five-eighths of an inch broad.

2. *L. nigriceps*, Franklin : *L. nasutus*, Scopoli, and *L. antiguanus*, Latham, both founded on Sonnerat's figure of his *Pie-grièche d'Antique* ; but the former name is objectionable, as referring to an individual deformity of the specimen figured, and the latter, as likely to convey the idea that it is a West Indian bird, from the more familiarly known island of Antigua, instead of the province of Antigue in Panay. It is also *L. tricolor*, Hodgson, *Ind. Rev.* 1837, p. 446 ; and *Indian Shrike*, Latham. This species is at once distinguished by having the whole cap black. The rufous hue of its upper-parts varies much in depth, and many have the nape more or less ashy. Inhabits all northern and central India ; being common in the Soonderbuns of Bengal, and on many of the *churrs* (or alluvial banks and islands) in the Ganges and its branches. It is also common in Assam, Sylhet, Tipperah, and Arracan.

3. *L. tephronotus*, Vigors, *P. Z. S.* 1831, p. 43 : *L. nipalensis*, Hodgson, *Ind. Rev.* 1837, p. 445 : *Grey-backed Shrike* of Latham. Size of the last species : wing three inches and three-quarters. Colour of

upper-parts dusky-grey, faintly washed with rufous on the back in most specimens; the rump and upper tail-coverts dark rufous: lores and streak through the eyes, black; as also the feathers immediately impending the nostrils in fine adults: a slight pale streak over the eye, more or less developed: throat, fore-neck, and middle of belly, white; the rest of the under-parts rufous. The females and young have the breast, flanks, and sides of the neck, rayed more or less with dusky: wings dusky, with rufescent margins to the tertiaries and coverts, more or less developed; and tail nearly uniform brownish, with its outer feathers and the tips of all paler. Common in Nepal and Bengal, and has been received from Tipperah and Arracan; frequenting the same haunts as the last species.

4. *L. erythronotus*, Vigors and Gould (nec Jerdon). Wing three inches and five-eighths to three and three-quarters: middle tail-feathers four and a half to five inches. Has a broad black frontal band, three-eighths of an inch and upwards; a dark ash-coloured head and nape, a little albescent in some towards the frontal band; and sometimes the whole back deep rufous up to the neck, at other times the upper back is merely tinged with rufous. A good distinction from the next species consists in the broad black streak through the eyes being continued for some distance beyond the ear-coverts, instead of terminating with them. Appears peculiar to the NW. Himalaya.

5. *L. caniceps*, nobis. Nearly similar to the last but smaller; the black frontal band much narrower; the grey of the head much paler, and spreading considerably more upon the back, becoming also much more whitish towards the front and over the black eye-band: below, the breast is whiter, and the rufous of the flanks more defined; and above, this is often confined to the rump and upper tail-coverts, and the posterior scapularies only; whereas in *L. erythronotus* (verus), the entire scapularies seem to be always deep rufous, and sometimes the whole interscapulary region, which is never more than tinged with rufous in the present species. Wing three inches and three-eighths to three and a half, and middle tail-feathers four and a half. A marked *individual* variety of this species—with grown tail only three inches and three-quarters long, the whole back and scapularies grey, and scarcely any rufous on the flanks, (but its plumage altogether much abraded)—I referred doubtfully to *L. minor*, in X, 841. The present is the

L. erythronotus apud Jerdon and others, of India generally; extending to Scinde on the west, and eastward it would appear to inhabit Assam, as Dr. Horsfield remarks of the Assamese bird that—"compared with the figure in Gould's 'Century of Himalayan birds,' it is considerably smaller, and the colours are more dull than in the Himalayan bird." It also occurs in Arracan, and in the Rajmahl hills in Bengal, but not lower towards the mouth of the river.

Col. Sykes remarks, of the *L. erythronotus* of his list of Dukhun species, that "this bird differs from *L. bentet*, Horsf., only in the crown being ash-coloured instead of black, and in the defined black bar across the forehead." *L. schach* (*v. bentet*), however, as described by Dr. Horsfield, has no black crown, but a black forehead ("*L. fronte lateribus colli alis caudæque nigris, vertice dorsoque griseis*," &c). *L. erythronotus* and *L. bentet* are successively larger than *L. caniceps*, with a successively broader black frontal band: but in other respects all three bear a near resemblance; *L. nigriceps* chiefly differing in its black cap, which indeed constitutes its only marked distinction from *L. erythronotus*; and among some birds which Lord Arthur Hay collected in the vicinity of Benares, is a specimen which has every appearance of being a hybrid between these two: it has the cap mingled fuscous and ashy, and the forehead above deep black as in *L. erythronotus*. We may accordingly look for the latter species at that distance from the Himalaya, probably as a cold season visitant.

6. *L. phænicurus*, Pallas: *L. cristatus*, Lin., founded on Edwards' figure (but the species is not crested); *L. rutilus*, var. A., and *L. superciliosus*, var. A, Latham: *L. melanotis*, Valenciennes: and *L. ferrugiceps*, Hodgson, *Ind. Rev.* 1837, p. 446. Brown, with more rufous head, tail, and its upper coverts; streak over the eye and the throat white, and the rest of the under-parts whitish with a fulvous tinge: lores and ear-coverts, forming a broad band through the eye, dull black. Females and young much rayed. This is one of the commonest of Indian birds, and as its particularly harsh chattering affords one of the earliest intimations of the advent of the cold season in Calcutta, its note is then far more acceptable than is warranted by the music of it. A few individuals, however, are procurable at all seasons within a few miles. This species is also common on the eastern side of the Bay of Bengal, extending southward to the Straits: where it is found together with the

L. superciliosus and with *L. tigrinus* of the *Dict. Class.* (v. *L. magnirostris*, Lesson, and *L. strigatus*, Eyton). Another allied species, but inhabiting further eastward in the Philippine Isles, is the *L. lucionensis*, Lin. I mention these to shew that I do not confound them.*

A marked variety of *L. melanotis* (for it can scarcely be admitted as a separate species) was found abundantly by Capt. Boys in the country lying between Scinde and Ferozepore. It is distinguished by its pale colouring, a predominant dull sandy-grey, scarcely tinged with rufous, except on the rump and tail; the lores being whitish (in a male and female presented to the Society by Captain Boys), but with a slight black spot adjoining the orbit above. If regarded as new, *L. arenarius*, nobis.

7. *L. Hardwickii*, Vigors: *Bay-backed Shrike*, Latham. Of this beautiful species, some females perhaps resemble the males; but they usually differ in their generally duller colours, in the total absence of the black upon the forehead, and over and before the eye, while the ear-coverts are nearly brown-black: some of them have a grey head and neck, not however very pure; and others a brown head and neck, the latter having also rays on the under-parts. This Shrike is common in most parts of the country from the Himalaya southward, but does not occur below the Rajmahl hills in Bengal, and I have never seen it from the countries eastward.

Tephrodornis, Swainson. To this genus must be referred—

1. *T. sylvicola*, Jerdon, *Catal.* S. India.

2. *T. pelvica*: *Tenthaca pelvica*, Hodgson, *Ind. Rev.* 1837, p. 447. Nepal, Tipperah, Arracan.

3. *T. gularis*; *Lanius gularis*, Raffles: *L. virgatus*,† Tem. Malacca, Sumatra.

These three species are very closely allied. The last is distinguished by its small size, and otherwise resembles *T. pelvica*. Length of wing three inches and seven-eighths. In the two others the wing measures

* There is a *L. ferox* described in the *Dict. Class.*, from Java, which I cannot identify; probably a female or young bird of its species. Also *L. vittatus*, Val., assigned to India, but with which I am unacquainted; the latter is probably not a true *Lanius*: *L. collurioides* of Lesson, in Belanger's Voyage, is described from Pegu.—Mr. Strickland suspects that *L. tigrinus* (v. *magnirostris*,) is probably a variety of *L. phænicrosus*; but it is a well marked distinct species.

† Misprinted *vulgatus*, in the *Dict. Class.* ?

four inches and a half: the male of *T. sylvicola* having the head dark ash-colour, and that of *T. pelvica* light grey; an invariable distinction.

4. *T. pondiceriana*, (Gm.): *Lanius keroula*, Gray; *L. muscipetoides*, Franklin; *L. griseus*, Tickell; *L. sordidus*, Lesson; *Muscicapa philippensis* of India, Latham; *Tephr. superciliosus*, Swainson; probably *Tenthaca leucurus*, Hodgson, *Ind. Rev.* 1837, p. 447. A very common Indian bird and generally diffused.

5. *T. grisola*, nobis, XII, 180 (*bis*). I killed an adult female of this bird with the same shot that brought down a young one of the preceding species, and I have never since met with it here: but the Society has recently received an undoubted specimen from Java, and another from Penang, so that the species has probably been named by M. Temminck.

Hemipus, Hodgson, *Ann. Mag. N. H.* 1845, p. 203. This genus is founded on a near affine to the *Muscicapa picata*, (Sykes): but a more typically characteristic species is

1. *H. obscurus*; *Muscicapa obscura*, Horsfield: *M. hirundinaceus*, Reinwardt; *Tephrodornis hirundinaceus*, Swainson. Common in the Malay countries. This bird was referred to *Tephrodornis* by Mr. Swainson, and subsequently by Mr. Strickland; and there can be no doubt of its affinity for that group; but its generic relationship is with *H. picatus* and *H. capitalis*. I observe that different specimens of this bird vary remarkably in length of bill; thus, of two males before me, one has the bill fully a fourth longer than that of the other; but intermediate specimens prove their identity, and there is not the slightest difference in other respects. In the short-billed specimen, that organ is in form and size absolutely similar to that of the larger-billed examples of the Indian species.

2. *H. picata*, (Sykes): *Muscicapa tyrannides*, Tickell, II, 574; *Musc. hirundinacea* of Jerdon's list.* Common in the hilly regions of Central and Southern India, and in Arracan.

3. *H. capitalis*, (McClelland,) *P. Z. S.* 1839, p. 157: *H. picæcolor*, Hodgson.† Very closely allied to the last (indeed I am not satisfied

* Mr. Jerdon suggests that *Musc. variegata*, Auct., is perhaps the female of this bird.—*M. maculata*, Tickell, Mr. Strickland suspects to be the European *M. atricapilla* (v. *luctuosa*, Tem.), pertaining to another group of Flycatchers.

† Dr. McClelland's coloured figure (unpublished) of his *Musc. capitalis* is decidedly Mr. Hodgson's bird, not very well represented.

of the propriety of its separation); but the back and scapularies appear always to be of a pitchy-brown colour instead of green-glossed black; while the cap of the male is as black as in the other, and in the female is marked by a blackish tinge: the tail, too, is, I think, generally somewhat longer, and the scapularies are often more or less brown, like the back. Inhabits Nepal and about Darjeeling, as also Assam.

A closely allied diminutive of these is the *Muscicapula melanoleuca*, nobis, XII, 940: a species common in the Himalaya and in Arracan, and which the Society has lately received from Java, so that M. Temminck has probably named it. By this and other *Muscicapulae*, the present group would be linked to the various black-billed blue Flycatchers; but I cannot pass conveniently to these just now.

Lalage, Boie. This genus connects the preceding birds with the *Grauculinæ*. I know but of two species, the *L. orientalis* Gm., v *Turdus striga*, Raffles, and *Sylvia leucophœa*, Vieillot,—and another nearly allied, but without the white supercilium, and shewing less white on the distal half of the wing, from Australia; this I take to be *Campephaga leucomela* of Vigors and Horsfield, *Lin. Tr.* XV, 215,—those authors describing only a mutilated female.

Grauculus, Cuv. The *G. papuensis*, Cuv. (v. *Macei*, Lesson, and *nipalensis*, Hodgson, *Ind. Rev.* 1837, p. 327,) is a tolerably common bird throughout India, as well as eastward of the Bay. Wing six inches and a half, and tail five and a half. *Ceblepyris javensis*, Horsfield, is perhaps distinct, as Mr. Strickland writes me word that its wing measures but six inches, and total length ten inches instead of a foot.*

Campephaga, Vieillot: *Ceblepyris*, Cuv.

1. *C. fimbriata*, (Tem.) apud Strickland (*in epistolâ*): *Lanius silens*, (Tickell†); *Volvocivora melaschistos*, Hodgson; *Grauculus maculosus*, McClelland and Horsfield; *Ceblepyris lugubris*, Sundevall; *Blue-grey Thrush* of Latham. Tolerably common in Bengal, Nepal, Assam, and in Central India; but has not hitherto been observed south of Goomsur.

* Mr. Jerdon remarks of the Indian species — “It appears doubtful if this be the true *papuensis* — if not, it is perhaps the *Gr. Macei* of Lesson.” *Madr. Journ.* No. XXXI, p. 122.

† The South African *L. silens* of Levaillant is a true *Curruca*, of which Mr. Strickland has lately favoured the Society with a fine specimen.

2. *C. melanoptera*, nobis, n. s. Nearly allied to the next, but larger, and of a deep ash-grey colour, paler on the belly, and passing to white on the lower tail-coverts; the wings wholly black; and tail the same, with large white tips to its outermost and penultimate feathers, and successively smaller ones to the rest. Bill and feet black. Length about eight inches, of wing four and a quarter, and tail four inches, its outermost feather an inch shorter than the middle ones. Discovered in Arracan (with so many other new species) by Capt. Phayre.

3. *C. Sykesi*, (Strickland), *Ann. Mag. N. H.* 1844, p. 36: *Cebl. fimbriatus* apud Jerdon, and probably *C. canus* apud Sykes (the young): *Eastern Thrush* of Latham. Adults of either sex of this species have the body light pure ashy; the head, neck, and breast, deep black; the lower breast and abdomen pale grey, passing gradually to white on the lower tail-coverts, &c. The young (or apparently one-year old birds) have the head grey, like the back; the throat and the entire under-parts whitish, with dusky cross-rays, and the rump also rayed less distinctly. It is about equally common in Lower Bengal with *C. fimbriata*, perhaps rather less so; I have never seen it from the Himalaya, or the countries eastward, and it seems to be tolerably common in Southern India.

A Ceblepyris cinereus, Lesson, from Java, is described in the 'Zoo-logie du Voyage de M. Belanger,' of which I have taken the following rough note. Length eight inches. Bill robust, hooked, toothed, dilate at borders; wings short, scarcely passing the croup. Tail of mean length, rounded as in the others. Colour ash-grey above, beneath whitish-grey; a little brown spot before the eyes; wings brown, the primaries slightly edged with white, and secondaries tipped with pale grey. Approaches the Shrikes in form of wings, tail, and tarse; and the *Artami* and *Drongos* in its beak.

There is also a *Cebl. culminatus*, A. Hay, from Malacca, described in the *Madr. Journ.* No. XXXI, 157.

The following species, from the Isle of France, I presume to be *Tanagra capensis*, Gm., referred to *Campephaga* in the *Dict. Class.* The beak is much stouter than in the Indian species, also straighter, and more strongly toothed at tip, but not very strongly hooked: the tip of the lower mandible curves upward, to lock within the notch of the upper one. Length of an adult female nearly nine inches; wing four and an eighth;

and tail three and a half: bill to gape above an inch; and tarse an inch. Upper-parts wholly deep cinereous, darker on the crown, and paler on the rump and upper tail-coverts; lores, and a streak beyond the eye, blackish-cinereous, surmounted by a slight whitish supercilium; wings blackish, the feathers margined with grey, and two or three of the primaries slightly with whitish; winglet and coverts of the primaries wholly blackish, and anterior two-thirds of the wing white underneath; the throat and lower tail-coverts are white, the breast light ashy, with faint traces of cross-rays in the specimen; belly slightly fulvescent white; and the tail is black, its feathers successively more deeply tipped with white to the outermost; form of the tail slightly graduated, its outermost feathers being half an inch shorter than the middle ones; bill and feet dull black. A young male differs in having its upper-parts tinged with rufous-brown, deepening considerably on the rump; breast and belly also with ferruginous patches; tibial feathers the same; and I am informed that the old male has the under-parts light ferruginous. Gmelin describes his *Tanagra capensis* to be yellowish, and such is likely to be the case with a still younger specimen than the male here noticed.

In XI, 463, I described a species from the island of Luzon, by the name *Ceblepyris cærulescens*. This is a very interesting bird, from its close affinity for *Irena*, which genus I had considered to approximate to the *Grauculinæ*, previously to remarking the affinity of this particular species. In the female and immature plumage of *Irena*, the resemblance to the *Grauculinæ* is seen more especially. *Campephaga cærulescens* is probably allied to *C. cinerea*, (Lesson), just noticed; having a larger and stouter bill than the Indian species, more as in *Irena*, only that the tip is more abruptly hooked and emarginated. Size and general characters of *Irena*, but the rump-feathers spinous to the feel, and the tail sub-quadrate, except that its outermost feathers are three-eighths of an inch shorter than the penultimate, which latter are also very slightly shorter than the rest. This bird might be regarded as the type of a new division, to which *C. cinerea* should also probably be referred.

Irena, Horsfield. A curious distinction between the Indian and Malayan *I. puella*, auctorum, has been pointed out by Lord Arthur Hay; to whom we are indebted for the discrimination of numerous

other closely allied species. In the Malayan bird, the under tail-coverts reach quite to the end of the tail ; while in *I. indica*, A. Hay, they are never less than an inch and a quarter short of the tail-tip in the males, and generally an inch and a half short in the females. I have verified this observation upon so many examples from both regions, that there can be no doubt of the fact ; and the Arracan *Irena*, and I think also the Tenasserim one, are identical with that of India. A third beautiful species (*I. cyanogastra*, Vig.), from the Philippines, has been recently figured by Mr. G. R. Gray.

Pericrocotus, Boie: *Phœnicornis*, Swainson ; *Acis*, Lesson. This genus has been approximated by Mr. Swainson and others to the *Grauculinæ* ; but the affinity is not particularly close. The following species are comprehended—

1. *P. miniatus*, (Tem.) Malay countries. (*Non vidi*).

2. *P. speciosus* ; *Turdus speciosus*, Lath. : *Muscipeta princeps*, Vigors and Gould. Himalaya, hill ranges of Central India, and sparingly those of South India ; common in Arracan, and extends southward to the Malayan peninsula. A few visit Lower Bengal in the cold season.

3. *P. flammeus* ; *Muscicapâ flammea*, Forster, figured in Pennant's 'Indian Zoology,' also in Swainson's Illustrations, and more recently by Mr. Jerdon: *M. subflava*, Vieillot ; *Phœnicornis elegans*, (?) McClelland and Horsfield, *P. Z. S.* 1839, p. 156 ; *August Flycatcher* of Latham, but the preceding species also referred to. Hab. South India and Ceylon. The description and unpublished figure of *P. elegans*, from Assam, would seem to indicate this species of Southern India.

4. *P. brevirostris* ; *Muscipeta brevirostris*, Vigors and Gould. Himalaya, and more sparingly the hill ranges of Central and Southern India.

5. *P. igneus*, nobis : Malayan *P. flammeus*, auctorum, and probably of Temminck, *p. c.* 263.* Size small, barely larger than *P. peregrinus*, the wing measuring but two inches and seven-eighths, and the rest in proportion ; bill to gape five-eighths, and tarse nine-sixteenths of an inch. Colour as in *P. speciosus*, except that the outer tail-feathers are less deeply red, and the wing-band is proportionally

* If this be the *Musc. flammea* of Dr. Horsfield's Javanese list, it would account for his describing what appears to be the true *flammea* from Assam, by another name.

smaller; the fore-part of the wing underneath, with the band as there seen, is deep yellow, and the axillaries are yellow, irregularly tipped with red. Altogether the red is of a shade more igneous than in *P. speciosus*, but considerably less so than in *P. flammeus*. The female I have not seen. Described from Malacca specimens.

6. *P. solaris*,* nobis, n. s. Length about seven inches and a half, of wing three and three-eighths, and tail four inches; bill to gape five-eighths, and tarse nearly five-eighths. Male fuliginous-ashy above, verging to black on the wings, and quite black on the tail; the rump, wing-spot, greater portion of the three outer tail-feathers, (and the under-parts, bright reddish flame-colour (or as in *P. flammeus*); throat orange-yellow, and the ear-coverts pale grey: bill and feet blackish. The female has the head dark ashy, like the male, but the back olive-green, and the flame-colour of the male is replaced by yellow; sides of the throat whitish. The bill of this species is broader and shorter than in the others. It is common at Darjeeling.

7. *P. roseus*; *Muscicapa rosea*, Vieillot: *Phœnicornis affinis*, McClelland and Horsfield†. Not rare in Lower Bengal; and occurs also in Assam, Arracan, and in the forests of Malabar.

8. *P. peregrinus*; *Parus peregrinus*, Lin. India generally.

9. *P. erythropygus*; *Muscicapa erythropygia*, Jerdon: *Cannpore Flycatcher*, and *Turdus speciosus*, var. B., of Latham.—South India, Upper Bengal. (?) This is a very aberrant species, and even separable as a subgroup; deviating, as remarked by Mr. Jerdon, in “its more depressed bill, weaker legs and feet, and in the mode of variation of the female. In its colour,” he adds, “the male resembles most of the species of *Pericrocotus*, except in having a white stripe on the wings, and on some of the tail-feathers. The female differs from the male in having ashy-brown instead of glossy-black, and cinereous-white where the male has bright orange-red. The irides also are light-coloured.” It seems, in fact, to be an intermediate form between *Pericrocotus* and *Hemipus* of Hodgson (p. 305 *ante*); near which latter Mr. Jerdon formerly arranged it, considering it allied to *H. picatus*‡.

* In some collections which have gone to Europe, I have called this species *P. flavogularis*, MS.

† Identified from Dr. McClelland's unpublished figures.

‡ Add, as a doubtful member of the group, *Phœnicornis? aureopygia*, A. Hay, from Hongkong; *Madr. Journ.* No. XXXI, 158: also, probably, *Lanius cruentus* of the *Dict. Class. D' Hist. Nat.*, from Java.

Eurylaimus, Horsfield. This group, the geographic limits of which, according to Mr. Swainson, "seem to be restricted to the hottest parts of India," is only admissible into the *Fauna Indica* from the occurrence of two Himalayan species, the range of both of which extends to Assam, Sylhet, and Arracan. These birds are the *Raya sericeogula* and *R. rubropygia* of Mr. Hodgson, *J. A. S.* VIII. 36; the former standing as *Psarisomus Dalhousiæ*, (Jameson) Sw., and the latter falling under Mr. Swainson's *Serilophus*, being very closely allied to *S. lunatus*, (Gould), for which it was mistaken in *Proc. Zool. Soc.* 1839, p. 156. The differences are as follow:—*S. lunatus* has the whole upper-parts rufescent, including the crown and cheeks; and it exhibits a remarkable structure of the tips of its primaries, the third and fourth especially, which terminate in acute points, as if artificially clipped, while the secondaries and tertiaries are truncate, and strongly emarginate at tip; moreover the third and fourth primaries are terminated by a large triangular white spot, and the secondaries and tertiaries have no white bar near the end of their outer webs:—*S. rubropygius* has the upper-parts deep ash-colour, with a faint rufescent tinge on the back; the primaries rounded at their tips, and narrowly terminated with white; the secondaries and tertiaries slightly truncate and emarginate at tips, with a triangular white spot near the end of the black outer web of each, beyond which the colour is bluish-grey. The white lunate mark tipping certain feathers of the sides of the neck is alike in both species, and does not seem to be a sexual distinction, but, I suspect, is attained after two or three moultings by both sexes. *S. lunatus* occurs in the Tenasserim Provinces, where also are found the *Corydon sumatranus* (which is the species described by Capt. Hay, in X, 575),—*Eurylaimus javanicus* (the range of which extends northward to Arracan),—*Eu. ochromalus* (v. *cucullatus*, Tem.),—and *Cymbirhynchus nasutus* (v. *lemniscatus*, Raffles), all common Malayan species, to judge from their frequency in collections from the Straits.

Cymbirhynchus was separated by Mr. Vigors on account of the forward position of the nostrils and some other particulars; and Mr. Swainson lays much stress upon the vertical depth of its bill, which certainly is a marked feature in the common Malayan and Tenasserim species (*C. nasutus*); but there is a very closely allied species in

Arracan, which, until I had obtained a good series of both, I declined to venture on distinguishing, but which I shall now designate

C. affinis, nobis. In this, while the general characters and colouring are the same as in *C. nasutus*, the bill is invariably much smaller and flatter, as in the restricted *Eurylaimi*, but the nostrils are placed forward as in the other. The general dimensions are also less, the usual length of wing in *C. affinis* being three inches and a half, rarely three and five-eighths, and the middle tail-feathers three inches; in *C. nasutus* the wing measures three and seven-eighths to four inches, and the tail, three and five-eighths to three and three-quarters. *C. affinis* has also, constantly, an oblong red spot margining the tip of the outer web of two of its tertiaries, and a third margining the inner web of the uppermost tertiary: in what appear to be the females, the latter spot is red as in the supposed males, while the former are white: these spots do not occur in *C. nasutus*. Lastly, the white upon the tail is more developed in *C. affinis*, and placed nearer the tips of the feathers: a white spot at the base of the inner primaries is also larger and more conspicuously shewn.

If the affinity of the *Eurylaimi* with the South American *Pipridæ* admit of doubt, the question would seem to turn on the relationship of the former for *Calyptomena*; for this Malayan genus appears truly to approximate to *Pipra* and more especially to *Rupicola*.* Mr. Swainson distinguishes two species of *Calyptomena* (*Lardner's Cyclopcædia*, 'Menageries', p. 296), as *C. Rafflesii* and *C. caudacuta*; and he assigns *India* as the habitat of the latter, erroneously unless by that word he means vaguely "the East Indies", a term now rapidly and properly falling into disuse. Notwithstanding, however, the difference in the form of the tail, and which is not so great as Mr. Swainson represents it, I feel satisfied that his *C. caudacuta* is the young of *C. viridis*, Raffles, who states that "the female does not differ in appearance from the male." The tail is a little graduated in these presumed young birds, but I have never been able to recognise the pointed form of the feathers represented by Swainson, nor the difference of size which he indicates; indeed

* Another Malayan genus with syndactyle feet, and which I have not yet seen, is the *Crataionyx* of Eyton, *P. Z. S.* 1839, p. 104: and to judge from the brief Latin definitions of his two species, *Cr. flavus* and *Cr. ater*, I think there is every reason to suppose them to be the sexes merely of the same species.

he adds, as a note, that he had entertained suspicions that *C. caudacuta* was merely the young of the other ; but continues—"and yet the different form of its tail-feathers is so totally opposed to this supposition, that until such a similarity" (meaning specific identity) "is established beyond all doubt, I must continue to hold the opinion here acted upon." That his *C. caudacuta* is a bird in immature plumage, I feel no doubt whatever ; and I can only say, that I have again and again seen it associated with adult *C. viridis* in Malacca collections, the two being evidently intended by the dealers who prepare these collections for male and female of the same.*

Near the *Pipridæ* of course rank the *Ampelidæ*, to which Mr. Hodgson refers his genus *Cochoa* (since called by him *Prosorinia*), V, 359, XII, 450 ; but this remarkable genus wants one noted character of the *Ampelidæ*, (including the Waxwings) and *Pipridæ*, in common with various other South American groups, having the first primary but one third of the length of the second, which again is considerably shorter than the third. Of the two species, *C. purpurea* seems common in the S. E. Himalaya, as at Darjeeling ; *C. viridis*, decidedly rare. For a specimen of this latter beautiful bird, the Society is indebted to the lady of W. H. Oakes, Esq., C. S. ; and the late Mr. Webb, of Darjeeling, among numerous other specimens with which he favoured the Society (including *Alcedo grandis*, *Accentor mollis*, *Pericrocotus solaris*, *Troglodytes punctatus*, *Tesia pusilla*, *Pomatorhinus ferruginosus*, *Certhia discolor*, *Chleuasicus ruficeps*, and other novelties yet to be described), obliged us with what is evidently a male, in nestling plumage, of *C. purpurea*, which is worthy of a particular notice. The wings and tail are as in the adult male ; but the back is quite black, the scapularies and smaller wing-coverts having a central brown spot on each feather ; coronal feathers broadly tipped with white, having a black margin at their extreme tips ; a portion of the ear-coverts similarly marked with white ; and the entire under-parts are light ferruginous, with a broad black tip to each feather, less developed on those of the middle of the throat. The plumage of the back, scapularies, and under-parts, recalls to mind that of a young male English Blackbird.

* Since writing the above, I have had an opportunity of examining several dozens ; and should remark that I could find no instance of a transitional moult, or indeed of any moulting bird among them.

POSTSCRIPT.—A further collection of Cingalese birds has just been received from Dr. Templeton, including some of considerable interest,—as the *Gallus stanleyi* of Gray, hitherto I believe only known from Hardwicke's published figure of the hen,—and the *Tetras bicalcaratus* of Pennant, which is quite distinct from the 'Curria Partridge' of Latham (*Perdix benulasa*, Val., v. *Hardwickii*, Gray, and *Francolinus spadiceus*, Ad. Delessart), but ranks with the latter and *G. spadiceus* in my genus *Galloperdix*, which represents, in India, the Polyplectrons of the countries eastward, to which they are much more nearly allied than is generally suspected.* Col. Sykes thought he recognised the *Gallus stanleyi* in what he terms a short-legged variety of *G. sonneratii*, occurring at an elevation of 4000 feet above the sea on the Malabar coast; but Mr. Jerdon and other subsequent observers know of but one species of jungle-fowl in that part of the country—the ordinary *G. sonneratii*, and the females of this bird have not (as Col. Sykes states) the "cartilaginous spots on the feathers," but young males have, when in plumage otherwise resembling that of the females. Moreover, *G. stanleyi* is quite as high on the legs as *G. sonneratii*; and, lastly, Mr. Jerdon has found no indications whatever of *G. sonneratii* having ever been domesticated, such as would have appeared in the plumage of its tame descendants—or of its having mingled its blood with the ordinary domestic stock, as Col. Sykes' remarks lead me to suppose.

It is worthy of notice that specimens of *Acridotheres tristis* from Ceylon are considerably darker-coloured than any I have seen from the mainland of India; whence the contrast between the vinaceous-brown of the body and the blackish hue of the neck is very much less decided, and the white of the vent and lower tail-coverts is in like proportion more strongly contrasted with the blackish vinaceous colour of the breast and flanks.

A similar relationship seems to hold between *Dicrurus leucopygialis* (p. 298 ante) of Ceylon, and *D. cærulescens* of continental India: the latter I have never observed to vary; but some specimens of the Cingalese bird have the corresponding portion of the abdominal region albes-

* This affinity is well exemplified by the general plumage of the females, and by the vertical carriage of the tail, as well as by the form of beak irregular number of spurs, &c. The *Polyplectron Northiæ*, of Hardwicke's 'Illustrations' is thus the female of *Galloperdix spadiceus*. *Ithaginis* of Wagler, with which Mr. G. R. Gray confounds these birds, is an allied, but very distinct division.

cent, which in the continental race is pure white; the upper-parts being also a shade blacker; and the bill (as previously remarked) seems always to be more strongly falcate at tip than in *D. carulescens*. The average dimensions, too, of the continental race are decidedly greater.

Pomatorhinus horsfieldii of South India has an analogous representation in *P. melanurus*, nobis, of Ceylon, which I shall describe with other species of this genus. Though approximating very closely, it is as well characterized as several admitted species of *Malacocercus*.

From these and similar instances, it would appear as if several species had a tendency to become more intensely coloured towards the equator; *Gallus bankinus* of Malacca is much deeper-coloured than that of India: and the difference of *Halcyon capensis* of India and of Malacca (pointed out in XIV. 190) is so marked that Mr. Jerdon proposes to call the Indian bird *H. brunniceps* (*Madr. Journ.* No. XXXI, 143;) but if considered distinct, it would bear the prior name of *H. gural*, (Lath.) Pearson, X, 633.* Our little tailor-bird of India (*Orthotomus longicauda*) occurs, but of a considerably darker colour, at Malacca, and together with two other species of its genus, *Orth. edela* and *O. cineraceus*. I could mention two or three more instances; but nevertheless, in the great majority of cases, examples of the same species from the most various localities are absolutely similar.†

(To be continued.)

Notes, chiefly Geological, from Seringapatam, by the Hegulla Pass, to Cannanore. By CAPT. NEWBOLD.

The geology of the country around Seringapatam I have already noticed.‡ Having passed its walls, my route lay westward over a strong, kunkerous, uneven, and rather sterile tract to Hussairpore (eighteen miles), on the banks of the Lachmi Thirth stream, a tributary to the Cauvery, where stands a ruined bungalow, built by the Hon. Arthur Cole.

Hussairpore.—The formation is a micaceous gneiss with veins of quartz, and beds of the same mineral, evidently interstratified with the layers of gneiss. These beds, on weathering, leave the surface soil

* The Malacca *H. capensis* is also smaller than its Indian representative.

† On the question of the very close approximation of numerous allied species, *vide* Agassiz, in the Edinburgh New Philosophical Journal, 1842, p. 97.

‡ Madras Journal, January 1840, pp. 129—33.

covered with their angular and rust-stained fragments. Glimmering hornblende rock, veined with milky quartz, and a pale flesh-coloured felspar alternate with the gneiss. The outgoings of two or three dykes of basaltic greenstone are passed on the roadside. The surface of the country from Seringapatam gradually rises as it approaches the ghauts.

Periapatam.—This place is twenty-five miles westerly from Hussairpore, and forty-three miles from Seringapatam. It stands on the rise of the western ghauts from the table lands of Mysore, on the frontier of the wild territory of Coorg. To the west the scenery is mountainous and clothed with forest; fifteen miles to the north rises Bettadapore to the supposed height of 6,000 feet, one of the loftiest summits of this part of the western ghauts: the elevation of Periapatam, barometrically calculated, is 4,000 feet above the sea's level.

The country between Hussairpore and the ghauts is a succession of rocky risings and falls of the surface, covered for the most part with reddish alluvial soil, over the face of which are scattered numberless angular fragments of the surrounding rocks; especially white and iron-stained quartz, and occasionally kunker. Some of these alluvia have not travelled far, since we often find the colour of the surface soil a true index to the nature of the rock beneath: viz. dark-red or coffee-coloured soil over hornblende rock and trap; light-red to sandy soil over gneiss and granite; light greenish-grey over talc-schist, and white, or what is nearly white, over felspar and quartz rocks.

The quartz beds, being usually harder than their neighbours, are written in white bas-relief characters over the face of the country. They never weather—like the felspars, hornblendes, and micaceous rocks—into clay, but usually break up into fragments by imperceptible fissures, into which water, impregnated with iron from the surrounding weathered rocks, soon insinuates itself and stains the rock. At length the particles, composing the fragments themselves, lose their cohesion, and break up into an angular gritty sand.

In the low grounds, intervening between the rocky swells, is a black or dark-coloured mould, which I should hesitate to call *regur*. It appears to me to be the result, first of vegetation produced by water resting there (like the oases of the desert), and finally of artificial culture, manuring, &c.

In these vallies flourish groves of palms and wild dates; and here the ryot carries on his simple process of cultivation.

At Periapatam itself, basaltic greenstone is seen in the bed of a nullah crossing the gneiss and hornblende rock, and veined with kunker. Large blocks of fine red granite are seen in the ruined fort walls, brought evidently from no great distance.

The ghaut line west of Periapatam presents a succession of round-backed hills and smooth knobs, which continue to Verajunderpetta in Coorg. Their surface is covered with dark vegetable mould, and shaded by a fine forest, the roots of which strike into the red loam or clay on which the vegetable mould rests. It produces excellent sandal wood for which Periapatam is a depôt. It was formerly the capital of Coorg, but fell under the Mysore Rajas in 1744, A. D. A little to the west, General Stewart in 1799, with two regiments of Europeans and three of Native Infantry, repulsed the Mysorean army under the personal command of Tippoo. The fort was blown up during the preceding campaign in 1790 by Tippoo, in anticipation of General Abercrombie's advance from Cannanore.

Verajunderpetta.—About eight miles from Periapatam the Mysore frontier is crossed into Coorg. The soil is so thick as to cover the rocks of the ghauts from observation in most part, and the dense forest adds to the difficulty of getting a good *exposé* of the strata. In one place I saw gneiss veined with a fine crystalline reddish granite. Both rocks rapidly weather from the moisture and heat of the climate.

A well, dug on the side of the road, exhibited a stratum of red clayey loam, about five feet thick, underneath which lay a bed of gravelly local detritus; about three feet below which, was gneiss with much silvery mica. The gneiss was penetrated by a large granite vein which appeared on the summit of the hill in blocks. This granite passed into pigmatite. Scattered blocks of hornblende rock, and basaltic greenstone also occur, the outgoings of dykes or beds.

Laterite.—About seven miles east of Verajunderpetta, I first observed laterite capping, and partially covering, a small round-topped hill. Its surface was bare, and cleared by the rains of the ochreous and lithomargic earths, which usually fill the cavities, and keep soft and sectile the weather-protected under-layers of this rock. It had almost the dark scabrous aspect of an iron slug in some parts, but in others, might be seen distinctly passing into the sectile lithomargic laterite, so much used in building. Like sandstones and other rocks, it varies in mineral composition even in the same mass—being, in one place,

argillaceous or felspathic; in another, quartzose; now, so ferruginous as to pass into clay ironstone; and at another time, presenting nothing but a bed of compact lithomarge.

The soil in the flats and vallies, where the Coorgs cultivate rice, is generally of a pale ochreous colour; and is clayey from the disintegration of the felspars which prevail now in the hypogene rocks. Fragments of quartz, iron, aggregated garnets, and quartz, mica slate, schorl and kaolin were picked up loose on the road.

Junction of laterite with granite.—The hill on which the Coorg Raja's palace stands at Verajunderpetta is of granite, capped with laterite. This granite is composed of a brownish felspar, resembling that of Mount Horeb, of quartz, black mica, and hornblende. The line of superposition is seen on the descent towards the Portuguese Chapel. The granite is hard and crystalline at the junction, and not in the least soft or friable, as it would have been had the mass of laterite, which caps it, been nothing more than its weathered (*in situ*) upper portions; as supposed by many theorists and speculators on the origin of this singular rock.

Quarries of laterite.—At a little distance are the quarries whence the blocks of laterite used for building are excavated. The laterite here lies under a thick layer of moist turfy earth, which keeps its surface from hardening under the sun's rays or atmospheric exposure, and is so soft and sectile as to be cut out with the Indian spade, like turf from a peat bog.

The town.—The palace of Verajunderpetta was built only two generations back, by the then Raja of Coorg, whose name it now bears. It is a large building, partly in the European style, on the top of a hill or rising ground to the west of the Pettah. The portico is supported by two elephants, twelve or fourteen feet high, constructed of stucco and brick, over iron frames.

The woodwork, glazed windows, roof, and every thing about the palace, is finished in a massive style; and convenient outhouses are enclosed, with the palace, within a high and massive wall.

The town is said to contain about 300 houses, inhabited principally by the Coorg Lingayet cultivators of the soil, a few Telingas, Bengalis, Mussulmans, and a flock of Roman Catholic Christians (about 100), under their Portuguese pastor. There are two *Jungum maths*.

The houses are neat, usually thatched, and shaded by a small verandah in front: all romantically situated in a sylvan amphitheatre, surrounded by mountain peaks and ridges.

It being market day, the bazar was so crowded that I could scarcely pass. Here were Mapillays groaning under bundles of odoriferous salt-fish from Malabar and Canara, and hundreds of bullocks laden with salt from Cannanore and Tellicherry, which is sold all over Mysore. Then came the Coorg market people from their sequestered villages, with bags of rice and paddy, baskets of eggs, fruits, fowls, &c. &c.

The clean, neat, white dress of the Coorg females is pleasingly contrasted with the gaudy dark petticoats of the wandering Brinjaris, who never wash or change this article of dress until it drops off, heavy with filth and vermin.

The Coorg men generally wear a sort of smock-frock, like the *Baju* of a Malay or Bedouin woman, and usually go armed with their peculiar knives which serve as weapons of defence, and also to clear the jungles they daily tread.

The larger of these knives (a sort of hatchet), is carried unsheathed in a brass socket, attached to the belt on the right side; the smaller is in front.

The Coorg does not differ much in feature from the Mysorean, but is invariably fairer, from the sandy forest and moist climate in which he lives. He is grave in manner, and in general studiously civil to Europeans. They are nearly all Lingayets, and I observed many of them worshipping the numerous images of the Indian Apis-Nundi, set up in the recesses of the forest.

Like the Malays, they usually live in separate campons, on the edge of the rising swells which divide the rice fields, and which are well shaded by cocoa, jack, and other fruit trees.

The Heggulla Pass.—From Verajunderpetta to the top of the Heggulla Pass, is about five miles of forest, ascent and descent, but rising on the whole to the edge of the pass at Bokerah.

Gneiss—in some places overlaid with laterite and penetrated by dykes of basaltic greenstone—massive hornblende rock, and glimmering hornblende schist, are the rocks seen both in detached blocks, and *in situ* at this watershed of the great line of elevation. The dense nature of the jungle and the rain which now began to pour down, were great obstacles to a full examination of the geological features of this

chain: a few angular blocks of a large grained, and a syenite, granite were also seen.

The descent to the foot of the pass is about six miles, and extremely steep. At its upper extremity I observed in a road section, first a thin layer of dark vegetable mould, then a thick bed of red clay, under which lay a stratum of laterite. Farther down in the pass, gneiss outcropped. Some of the cavities, in the laterite, contained a black bole.

Fragments of white quartz, imbedding large crystals of felspar, often pinkish, were picked up imbedding a silvery-white mica, in large plates.

Farther down the pass I did not see the laterite. Hornblende schist with garnets of a massive thick-bedded structure was the prevalent rock. This had often been blasted to improve the road; and the beds of clay, which covered it, had been removed, exhibiting the different stages of weathering which this rock undergoes.

Blocks of this kind not only often exhibit a concentric structure like that of granite, but still oftener a pseudo internal structure, from weathering internally in layers conformable to their exterior surfaces.

Fragments, several feet in diameter, are seen thus weathered; with nothing but a dark crystalline nucleus of the rock in its original state in the centre, to tell us what the variegated soft mass before us once was. Even the nucleus disappears before the ravages of this *maladie du granit* in due time.

This decay does not commence from the core, but from the exterior of the block, whence it sinks by successive phases from the circumference towards the centre.

The effect of these different stages of decay is to produce, in the substance of the block, differently coloured bands, one within another, (like the lines of agate) often arranged around a nucleus of sound dark crystalline hornblende rock in the centre. The first band around this nucleus is of a grey colour, from the felspar whitening, and the segregation, &c. of the iron, which coloured it. The hornblende crystals are little affected, and the felspar is often seen running among them in whitish reticulation.

The next band exhibits the rock in a state of greater decay. In this the hornblende crystals have commenced to oxidize; and, without mingling with the felspar, assume an orange-brown hue, still mottled slightly with dark specks. This band has a mottled appearance, and resembles a weathered granite.

The third stage shows the felspar reduced to a white clay, and the oxidated hornblende crystals losing their shape, spreading their colouring matter in irregular patches through the clay. Where nests of garnets occur, their disintegration imparts a crimson-mottled appearance, often seen in the white lithomargic earths of the ghauts. The faint violet, or lilac-coloured, spots result from the decay of amethystine quartz or other minerals, impregnated with manganese which imparts this beautiful colour: mica usually imparts a light bright-red.

Lastly, the whole of the colouring matter—iron, titanium, and manganese—become equally diffused through the clay, which is now either of a light ochreous-brown colour, or reddish-brown, according to the greater or less ferruginous character of the rock. Where quartz prevails the decayed mass is more friable and earthy, and the colours are in general lighter than in the clays resulting entirely from the disintegration of felspar rock; a fact probably to be attributed to the action of the alkali, contained in the latter mineral, on the metallic oxides.

The red variety of clay prevails most on the hornblendic rocks of the Heggulla pass: near the base of the pass it lies in a stratum twelve feet thick, imbedding angular blocks of hornblende rock, fast decaying.

It rests immediately on hornblende rock *in situ*, and is covered by a light brown earth, of mixed alluvial and decayed vegetable matter, intersected by roots of trees, shrubs and grasses, and three or four feet thick.

The roots of the larger forest trees descend into the clay bed, which is sometimes intersected by crumbly veins of white quartz, which may be seen continued into the substance of the clay from the subjacent bed of rock; proving the disintegration to have taken place *in situ*; and that these clay beds are not the result, in general, of aqueous transportation. Where much iron and quartz prevail, the clay is apt to become cellular, an appearance which must not induce observers to confound it with true laterite. The pass is much steeper than those of Devamunni, Hossamucki, and Bisly, farther north, but is nevertheless practicable for lightly laden bullocks. The Bombay army, in 1791, advanced towards Mysore by this route, and expended two days in dragging twenty light field guns up two miles, and three weeks to bring up fourteen battering guns with their tumbrils, none heavier than eighteen-pounders. Near the bottom of the pass, the true laterite

is found, which, from the base, covers the low hills and knolls westerly to Vyathoor.

Stony River : foot of Heggulla pass.—In the bed of this river lie large irregular blocks of massive hornblende rock with garnets, and a granite with both mica and hornblende, evidently rolled down (like those on the slope of the pass,) from the adjacent heights. The hornblende rock is usually crystalline, but there occur globular masses of compact basaltic greenstone, with needle-shaped crystals of augite shooting irregularly through its substance; those probably are from some large dyke in the vicinity. The garnet occurs both massive, dodecahedral, and semi-foliated; the last is the most common variety.

Vyathoor.—The Coorg frontier is crossed into Malabar, close to the Stony river, from which the first Malabar village, Vyathoor, is about five and a half miles distant, and about twenty-nine and a half miles inland from Cannanore. The adjacent country is rocky, and covered with jungle: laterite continues capping the granitic and hypogene rocks, principally granitic hornblende schist. The beds of the mountain-streams abound with fragments of garnet. I found none of the crystallized specimens of any magnitude. Magnetic iron-sand also is found in their beds in small quantities. The Moplay town of Ercoor lies about eleven miles farther, on a fine clear stream, called the Rokaat, which debouches near Mount Delli at Markaree. The houses have upper stories, are built of laterite, and have a remarkably substantial and neat appearance.

Cudully.—This place is about ten miles inland from Cannanore. The surface of the country is rugged and uneven, with low hills and cliffs of laterite, and still covered with luxuriant jungle. In many places the jungle has been fired, leaving the black precipitous tabular masses of laterite, which cap them, exposed. The hornblende schist is still seen in low situations. Black pepper, betel and rice, are extensively cultivated.

Cannanore.—Nearer Cannanore, passes are cut through high cliffs of laterite, and steps planed down the sides of the terraces, which descend towards the sea coast. Hornblende schist veined with quartz is still seen as the underlying rock. At Cannanore, the laterite terminates in high, sea-washed cliffs.

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On the Coins of the Independent Muhammadan Sovereigns of Bengal.

By J. W. LAIDLAY, ESQ., *Co-Secretary Asiatic Society.*

Some months ago, as most of the readers of this Journal are perhaps aware, the greater part of the collection of ancient coins belonging to the Asiatic Society was abstracted from the Museum, and along with these, a valuable gold medal, the gift of the present Emperor of Russia. About the time when this unfortunate event occurred, I was engaged in arranging a series of the coins of the independent Muhammadan sovereigns of Bengal, and had reason to believe, that with the assistance of the Society's cabinet, which contained many rare and unique specimens of that type, I should succeed in filling the gaps in my own collection, and render the series tolerably complete. As misfortunes, however, rarely happen singly, it occurred that just about the same time, my own little cabinet sustained a similar loss. At a moment of neglect,—for we have in general but our own negligence to blame for mishaps of this nature,—nearly the whole of my gold and silver coins, including many uniques, and almost all of the series now under consideration, a series which had employed many years and much labour to collect, were purloined from my cabinet, those of copper only being spared to me, as being of too little intrinsic value to be worth the labour of removal.

The coins which record the names of the obscure Muhammadan dynasties of Bengal have, it must be confessed, nothing in common with the high interest attached to the relics of ancient India and Bactria, which bring us in contact with times and persons of classical renown; or illustrate those dark but profoundly interesting periods in the world's history, upon which the light of tradition falls but dimly. Yet, even independently of their more important use in correcting or in confirming the narrative of the historian, they have an interest of their own in their very rarity, which is such, that it is far easier to procure the coins of Alexander or his successors, than those of the Sultans of Bengal, of whom indeed few other monuments, and scarcely even these, remain. Of Gour, or Laknauti, the once vast and magnificent seat of their government, the capital whose wealth and splendour claimed for it the title of the 'seat of paradise,' scarce a vestige is to be seen: over its entire site, once instinct with thronging multitudes, nature has resumed her quiet sway, and the last traces of the mighty city are fast disappearing under the peaceful labours of the husbandman.

It is with the view of preserving a few authentic memorials of a dynasty of kings, of whose history so little is known, that I venture to submit a series of such coins as escaped the disasters above alluded to, or were happily figured before them. Some of these are in less perfect preservation than is desirable; but let us hope, that such collectors as may be in possession of better specimens, will be induced to supply impressions of them, by means of which, these defects may be remedied on some future occasion.

The first of the Muhammadan rulers of Bengal who attained any thing approaching to real independence was Iliyas Shah, who successfully resisted the arms of Feroz Shah, and concluded a treaty of peace with that Emperor at Akdala, A. H. 757. He caused the coin of his kingdom to be struck in his own name, the least equivocal sign of independent sovereignty, without experiencing that immediate interference on the part of the Emperor of Delhi which attended all similar manifestations of his predecessors. In this respect, as well as in the permanence of his dynasty, Iliyas Shah must be regarded as the first independent Sultan of Bengal; for his predecessor Fakhar ud-din, who is generally considered so by native historians, had scarcely thrown off his allegiance to Delhi, when his unstable authority was subverted by Ali Mobarik, an

officer acknowledging the supremacy of the emperor, who put him to death and himself assumed the emblems of independence. His reign, however, if a short usurpation may be so designated, was soon terminated by Iliyas Shah, who assassinated Fakhar ud-din, and took possession of the kingdom, which he governed with vigour for sixteen years, and transmitted to his descendants. The coins Nos. 1 and 2 were struck by this prince; they bear no date, and their execution is sufficiently rude—

OBVERSE.

السلطان العادل شمس الدنيا والدين ابو المظفر الياس شاه
السلطان

REVERSE.

سكندر الثاني يمين الخلافة امير المومنين

He* died in A. H. 760, and was succeeded by his son Sekandar Shah.

This prince reigned, according to Ferishteh, for nine years and some months, maintaining by the prudent adoption of his father's policy, the independence and integrity of his kingdom, when the utmost efforts of Feroz Shah were once more put forth to reduce him to a state of vassalage. No. 3, is a coin of Sekandar. It is in good preservation, and was procured at Santipore, near Culna. It records the titles and paternity of this prince, but no date—

OBVERSE.

الواثق بتايد الرحمن ابوالمجاهد سكندر شاه ابن الياس شاه
السلطان

REVERSE.

يمين الخلافة الله ناصر امير المومنين عون الاسلام والمسلمين
خلد الله ملكه

The inscription on the margin is not legible. Sekandar Shah died, or according to some, was killed in an engagement with his son and successor Gheias ud-din, in A. H. 769.

Nos. 4 and 5, are coins of the last named Sultan. As usual with the coinage of that period, they bear no date—

* Before ascending the throne he was known as Haji Iliyas; he is said to have founded the town of Hajypore.

OBVERSE.

غياث الدنيا والدين ابولمظفر اعظم شاه ابن سكندر شاه ابن
الياس شاه السلطان

REVERSE.

ناصر امير المومنين عون الاسلام والمسلمين خلد ملكه

Gheias ud-din seems to have been a gay and accomplished prince. He was in correspondence with the poet Hafiz, who addressed an ode to him. He died according to Ferishteh A. H. 775, having reigned six years and some months.

His son Seif ud-din succeeded on the throne with the pompous title of Sultan Assulatin. I have not been fortunate enough to procure any coins of this monarch, but copy that figured No. 6, from Marsden's '*Numismata Orientalia*'—

OBVERSE.

سيف الدنيا والدين ابولمجاهد * * * شاه ابن اعظم شاه
ابن سكندر شاه ابن الياس شاه السلطان

REVERSE.

ناصر امير المومنين عون الاسلام والمسلمين

Historians ascribe to him a reign of ten years. He died in A. H. 785, and was succeeded by his son Shams ud-din Sani, the last of a dynasty unusually long in those times. The author of the *Tabqât-i-Akbari*, Nizam ud-din Ahmed, ascribes a short but prosperous reign to this prince; but Ferishteh describes him as young and inexperienced; from which we may infer, that he was most probably assassinated by his successor, a powerful Hindu nobleman, named Raja Kanis, (Ganesa?) No coins have been found of Shams ud-din Sani, who died in 787.

As Raja Kanis never openly embraced the Muhammadan faith, it is most probable that he never issued the coin of the realm in his own name. To have omitted the usual symbols of Muhammadanism would have been a perilous experiment on the forbearance of the bigoted followers of the prophet, and to insert them would have compromised the Raja with the adherents of his own faith. Either alternative was, perhaps, avoided by the issue of no new currency during his reign,

which lasted seven years. He died in A. H. 794, and was succeeded by his son Junmul, or Cheitmal. This prince avoided the perplexities of his father's anomalous position by summoning the nobles on the death of Raja Kanis, and publicly professing his conversion to Islam, which he artfully insinuated had taken place in his early youth, but had remained unavowed in deference to his father. He assumed with the emblems of sovereignty, the title of Jellal ud-din Muhammad Shah. There are, I believe, many of his coins bearing dates, according to Marsden, from 819 to 823, although the commencement of his reign is fixed by historians in 795 and its termination in 812. The specimens Nos. 7, 8, and 9, are very much defaced, and bear no date. The first two are taken from impressions presented to me by the late James Prinsep. The inscription upon the obverse seems the same in all—

جلال الدنيا والدين ابوالمظفر محمد شاه السلطان

and on the reverse in Nos. 7 and 9 ناصر امير &c. In No. 8, apparently the Kalmeh. This prince took much pains to improve and adorn the city of Gour, and there may be still some few remains of public buildings erected at his expence.

No. 10, is a coin of his son and successor, Ahmed Shah, who died according to Ferishteh and Nizam ud-din, in A. H. 830; but this coin does him the good service of prolonging his life to 836, which date it bears. His reign, however, must as to its earlier part be curtailed by the evidence of the dates on those of Jellal ud-din—

OBVERSE.

السلطان * * * شمس الدنيا والدين ابوالمجاهد
احمد شاه ابن محمد شاه السلطان

On the reverse, the Kalmeh and date :—۸۳۶

After an interregnum of a few days, during which, a slave of the royal household having usurped the throne, caused the sons of Ahmed Shah to be murdered, and was afterwards destroyed himself. Nasir Shah, a remote descendant of Iliyas Shah, the first of our series, was summoned by the nobles from the plough, to which the adverse circumstances of his family had driven him, to sit on the throne of his ancestors. Being

unable to record a royal paternity on his coinage, he seems to have contented himself with the simple repetition of his name and title—سلطان ناصر شاه in seven little circlets, occupying the obverse of his coin No. 11. The reverse is illegible. I have met with no other coin of this prince.

The next king of Bengal recorded by historians is Barbek Shah, whom they designate the son of Nasir Shah. But there is reason to reject this affiliation as incorrect; for Barbek Shah describes himself on his coinage as the son of Mahmud Shah, as does also Yusuf, the son of Barbek, as will be seen. The same Mahmud is also recorded on a subsequent coin of Fattah Shah. But historians make no mention of such a prince. Can it be that his reign has been entirely overlooked by history? or did Nasir Shah, at any period of his life subsequent to ascending the throne, change his name for that of Mahmud? There are great difficulties in either view of the matter, but it does not seem a very bold conjecture, considering the imperfect history of those times, that Mahmud Shah may have been omitted in the roll of princes that has reached us.* The remarkably long reign ascribed to Nasir Shah seems to afford room enough for the interpolation of another king; but on either supposition, I incline to ascribe to the father of Barbek Shah the coin No. 12; for an impression of which, I was indebted to the kindness of the late James Prinsep. The cufic characters on the reverse are not usual upon the Bengal coinage; but the small circlets, with the monarch's name on the obverse, seem to establish a relationship between this coin and the preceding one of Nasir Shah. The only words legible on the obverse are—

محمود شاه سلطان

On the reverse, the Kalmeh.

Of the coins of Barbek Shah, I have met with none; but to render as complete as possible the present series, I borrow that figured in plate No. 13, from Marsden's work—

* That there is nothing very extravagant in this conjecture may be inferred from the circumstance of the omission of one entire reign (that of the last Mahmud) by Ferishteh. The reign of Yusuf Shah is in like manner omitted in the *Tabqât-i-Akbari*; but this may possibly be the fault of the transcriber who made the copy in the Society's Library. Since the above was printed, I have met with a coin of Mahmud, which bears a strong family likeness to those of Fattah Shah in the Plate.

OBVERSE.

السلطان الاعظم باربک شاه السلطان ابن محمود شاه السلطان

REVERSE.

The Kalmeh and date 873.

The next, No. 14, is a coin of his son and successor Yusuf Shah. For this handsome specimen I am indebted to the kindness of my friend Mr. Maseyk of Junghipore, whose skill in the acquisition of these relics is unrivalled. This coin confirms the affiliation of Barbek Shah, and leaves no room to doubt that a prince named Mahmud Shah sat on the throne of Bengal; but whether identical or not with Nasir Shah, we have at present no monuments to determine. It is most singular, however, that no mention should be made of this name in the history of the times—

OBVERSE.

شمس الدنيا والدين ابوالمظفر يوسف شاه سلطان ابن باربک
شاه سلطان ابن محمود شاه سلطان

REVERSE.

The Kalmeh and date— ٨٨٤ خزانة

After the death of Yusuf Shah, a youth of the royal family was raised to the throne, with the title of Sekander Shah, but was, after a few weeks, deposed for incapacity, and was succeeded by his uncle Fatteh Shah. Historians do not mention the genealogy of this king; but his coins, Nos. 15 and 16, which are, as far as I am aware, unique, make him the son of Mahmud Shah, and consequently the brother of Barbek Shah. The inscription on these coins runs from reverse to obverse—

السلطان ابن السلطان حلال الدنيا والدين ابوالمظفر فتح شاه
ابن محمود شاه السلطان فتح آباد ٢ * * *

Fatteh Shah was killed according to Ferishteh, in A. H. 896, by Barbek, a eunuch, who usurped the throne under the title of Sultan

Shahzada, and reigned about eight months. He was, in his turn, assassinated by an Abyssinian, named Mulk Andiel, who setting aside the legitimate heir, a son of Fatteh Shah, assumed the royal authority with the title of Feroz Shah. We must not be surprised if there remain but few coins or other monuments of those barbarous and unsettled times, when, as the Persian historian naively remarks, "to have killed the murderer of the king was deemed in Bengal a sufficient title to the vacant throne."* Of Sultan Shahzada there are no coins extant: perhaps none were ever struck; but Marsden has preserved one of Feroz Shah, of which, to continue the series, I here give a copy—

OBVERSE.

تاج الدنيا والدين فيروز شاه السلطان

REVERSE.

* * * * السلطان العهد والزمان

Date on the margin of the obverse—۸۹۷, 897.

At the death of Feroz Shah, he was succeeded on the throne by Mahmud Shah, stated by Ferishteh to have been his son. Of this prince I have met with no coins; at least with none that can be, with certainty, ascribed to him. His reign was a very short one, and specimens of his coinage are not likely therefore to be numerous. Amongst the coins figured by Marsden, as those of the Patan dynasty of Hindoostan, is one of Mahmood Shah, so palpably that of a Bengal king, that it is difficult to imagine how it could be ascribed to any other. There is no date upon it to enable us to fix it with certainty upon the son of Feroz Shah; but the execution of the coin and the locale of coinage, فتجاہاد of which several letters are legible, leave no doubt of the class to which it belongs: and as there is no other Mahmud with whom he can be confounded, unless it be the apocryphal father of Barbek (for the coins of Mahmud, the son of Husein, are very distinct from this), I have little doubt that this is the appropriate place for it—

* سالی چند این رسم بنگاله بود که هرکه کشندهء حاکم خود را بکشد و آنقدر فرصت یابد که بجای او بر تخت نشیند. Feristeh.

No. 18. OBVERSE.

السلطان العادل ناصر الدنيا والدين ابوالمجاهد محمود شاه

السلطان

REVERSE.

الموید بتايد الرحمن فتحاباد

The reign of Mahmud Shah was a short one. In A. H. 900, he was murdered by Seddee Badr Dewaneh, who ascended the throne with the title of Mozaffer Shah. No. 19 is a coin of this execrable prince, which Marsden has erroneously ascribed, as the foregoing, to the Patan sovereigns of Hindoostan. In execution and other respects, it is so perfectly coincident with other Bengal coins, that there need be no hesitation in appropriating it to the present king, the only one of the name among those of Bengal—

OBVERSE.

شمس الدنيا والدين ابوالمظفر مظفر شاه السلطان خلد الله

ملکه فتحاباد

REVERSE.

The Kalmeh.

Mozaffer Shah reigned about three years, during which he rendered himself hateful to his subjects by his many atrocities. He suffered in turn the same fatè which he had inflicted on his predecessor; and Ala ud-din Husein Shah, a nobleman of distinguished but not royal rank, ascended the throne by the usual path of blood. This prince enjoyed a degree of authority and safety, which had not fallen to the lot of any of his recent predecessors. Of his coins numerous specimens are extant, bearing testimony by their number and variety, to his peaceful and prosperous government. Nos. 20 and 21, are two out of many that have passed through my hands. The inscription continues from the reverse to the obverse—

السلطان العادل علا الدنيا والدين ابوالمظفر حسين شاه السلطان

ابن سيد أشرف حسينى خلد ملکه * * * * * ۱۲ * * *

Husein Shah reigned twenty-four years, and notwithstanding some unjustifiable proceedings in the early part of his career, was deservedly beloved by his subjects, and respected by surrounding governments. The emperor Sekandar, who had subdued the province of Behar, marched against Husein Shah; but found it convenient to arrange a treaty of peace with so vigorous a prince, and withdraw towards Delhi, ere the commission of aggression on either side rendered a friendly adjustment impracticable. Ala ud-din died in 927 at Gour, where his tomb still exists. Many monuments of this reign are scattered over the country.

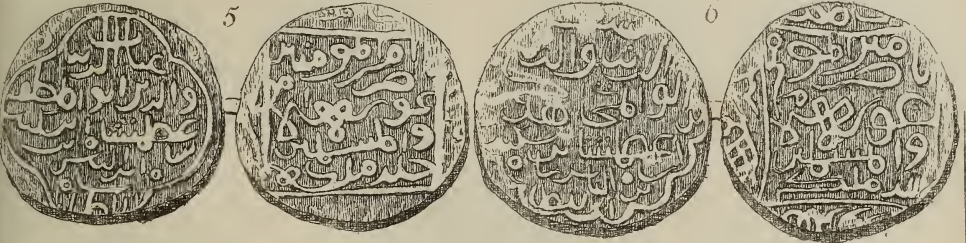
Husein Shah was succeeded by his son Nasrat Shah, or, as he is improperly styled by historians, Nasib Shah. From the accession of this prince may be dated the decline of the independent kingdom of Bengal. The chronology of his reign is involved in much perplexity, which unfortunately the dates upon the coinage of the times, do not assist in unravelling. Historians seem to have fused the events of two reigns, those of Nasrat Shah and his successor, into one; and notwithstanding their comparative recency, there is more uncertainty and confusion in the history of those times, than in that of the earlier periods of the kingdom. The coins Nos. 22 and 23, are two of several that have passed through my hands. They have no date, but their legend and the locale of their coinage leave no doubt as to the propriety of their ascription to this prince. The inscription reads from reverse to obverse—

السلطان ابن السلطان ناصر الدنيا والدين ابوالمظفر [فتحاباد]
نصرة شاه السلطان ابن حسين شاه السلطان حسيني خلد ملكه

Nasrat Shah came to the throne under the most favourable auspices, as far at least as regarded the internal condition of his government as bequeathed by his wise and vigorous father; but from his cruel and tyrannical disposition gave great disgust to his subjects and dependents. He was assassinated by his own servants after a reign, (according to historians) of eleven years. This would make the date of his death 938, (according to others it was 940 or 943,) but this does not agree with the date inscribed upon the next coin.

Nasrat Shah was succeeded by Mahmud Shah. This king is altogether omitted by the author of the *Tabqât-i-Akbari*, who ascribes all

Independent Muhammadan Kings of Bengal.



Independent Muhammadian Kings of Bengal.

13

14



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16



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18



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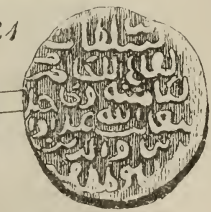
20

20



22

24



24

23



the events of his reign to that of his predecessor. Ferishteh briefly mentions Mahmud as a nobleman of Bengal; but he is correctly described in a Persian history of Bengal now before me, as the brother of Nasrat Shah. I have had several of his coins in my possession, but find room in the present plate for one only, No. 24. They are all distinguished by having a small circle on each face, concentric with the rim of the coin, containing what appear to be the words نذرشاهی

REVERSE and OVBVERSE read continuously—

السلطان ابن السلطان غياث الدنيا والدين ابوالمظفر محمد شاه
السلطان ابن حسين شاه السلطان خلد الله ملكه و سلطنه
۹۳۳

and on some of the coins the place of coinage *حنتاباد*. It is the date upon this coin 933, which is so irreconcilable with the chronology of written history. Mahmud died according to Ferishteh in 945, and with him was extinguished the independence of the kingdom of Bengal. The city of Gour was invested by the hostile armies of the emperor Homayun, who, on its capitulation, held his court there for some months.*

Sometime, however, elapsed ere the kingdom of Bengal was finally attached to the Moghul empire; for the different rulers, who were from time to time appointed to administer the government in the name of the emperors of Delhi, omitted no opportunity of seeking to throw off their allegiance, and occasionally to a considerable extent succeeded in doing so. The coins of these rebellious subjects, from Shir Shah, who usurped under Homayun, to Daud Khan, when the kingdom was finally absorbed by Akbar, as well as of those who attempted independence before the dynasty of kings which we have just been considering, may furnish an interesting subject of future notice; more particularly, if collectors who may be in possession of specimens, would be good enough to communicate impressions or drawings of them.

* For an interesting account of the state of Bengal at this period and the circumstances attending its conquest by Homayun, the reader may consult Joao de Barros' work, *Dos feitos que os Portuguezes fizeram no descubrimento e conquista dos mares e terras do Oriente*; fourth decade, ninth book.

*Description of a new species of Tibetan Antelope, with plates.** By B. H. HODGSON, Esq., Darjeeling.

RUMINANTIA.

CAPRIDÆ.

Genus.—GAZELLA ? CAPRA ? *New Genus.*—PROCAPRA MIHI.

Generic Character.—Horns in the males only. Nose ovine; no lachrymal or inguinal sinuses; interdigital foss small; mammæ two.

Type.—P. Picticaudata mihi.

Rágóá and Góá of the Tibetans.

Sp. Ch.—Goat antelope; with medial, elliptic, black horns, inserted between the orbits, and directed upwards and backwards with a bold curve and slight divergency; the tips being again recurved forwards but not inwards, annulated nearly to the tips; the rings being complete, separate, and 25 to 27 in number; short, deep head, finely attenuated; large eyes; long, pointed, and striated ears; very short, depressed, triangular tail, and long and delicate limbs. Pelage consisting of hair only, of medial uniform length and fineness, varying with the seasons like the colour. Above, sordid brown,† tipt with pale-rufous; below, with the lining of the ears, the entire limbs almost, and a small caudal disc, rufescent-white; no marks whatever; no tufts to knees; tail black. Length from nose to anus about three and a half feet. Height about two feet. Horns along the curve, thirteen inches; straight, eleven inches. Habitat: the plains of Tibet, amid ravines and low bare hills: not gregarious.

The above generic character, it will be seen, is drawn up in conformity with the system of Mr. Ogilby,‡ who, being the latest, is probably the least inaccurate investigator of the vast and heterogeneous group of antelopes. But the fact is, that by far too little is yet known of the real and intimate structure of the majority of the species of this group, to admit of any present arrangement of its contents into generic divisions being satisfactory. A long tract of time will be needed to perfect our knowledge of recorded species; and in the meanwhile, it seems better to distinguish generically new species whose organization cannot be reconciled with the results of existing systematic researches, than to go on loading the antilopine mass with additional discordant

* The plates are being coloured and will shortly be published with the title page and index of the present volume.—EDS.

† In summer.—In winter canescent-slaty, smeared on the pale surface with fawn. Internally the hairs slaty blue.

‡ Proceed. Zoological Society for December, 1836.

materials. Having said thus much in apology for bringing forward a new genus, I should add in explanation of my lengthy specific character, that a necessary regard to precision must render a dispensation with the canons of Linneus indispensable, so long as innumerable, vague, and shadowy species shall continue to be the plague of Zoological science. The exceedingly graceful little animal, which is the subject of our present description, is called by the Tibetans Rágóá, or Góá simply, and they allege that it is found generally throughout the plains of middle and eastern Tibet. But those plains, it must be remembered, are, for the most part, broken by deep ravines or low bare hills, and it is in such situations more especially, that the Góá dwells, either solitarily or in pairs, or at most small families, never in large flocks. The species is said to breed but once a year, and to produce ordinarily but one young-one at a birth, rarely two; and it is added, that it browses rather than grazes, preferring aromatic shrubs and shoots to grass, of which latter, indeed, its habitat is nearly void. I have not heard that the Góá is ever tamed, but it is killed for the sake of its flesh, which is esteemed excellent, and is free from all caprine odour, even in the mature males. In size, proportions, and superficial aspect, our animal bears considerable resemblance to *Antelope africana* and to *bennettii*; but not to *gutturosa*, with which last named species Mr. Blyth supposed it to be identical, upon inspection of a female transmitted last year by Dr. Campbell to the Asiatic Society. But the following description and drawings will serve clearly to distinguish it from all those species. The Góá is in size equal to *bennettii*, and is remarkable for the same exquisite grace and delicacy of form. The head is short, compressed, deep towards the horns, and thence much attenuated to the nose, which is neither bluff nor bristly, as in the Dseren and Chirú, but smooth and fine. The nostrils are narrow, nor do they, or the lips, show the least trace of a nude moist muzzle: the chaffron is straight; the eye very large, and (I am told), dark; the ears long, narrow, pointed, and striated. The horns, which rise between the orbits and are of medial size, larger considerably than in *africana* or *bennettii*, proceed upwards and backwards with a bold ibex-like curve, the last inch and a half only being somewhat recurved, and the divergency moderate and gradual, increasing almost uniformly from a basal interval of half an inch to a terminal one of four and a quarter inches. In young specimens the tips of the horns incline inwards as well as forwards, and as the backward arcuation of the horns is in them much less than in maturity, the horns of the young thus come to possess the lyrate form, which is hardly, or not

at all, noticeable in the mature animal. The horns are equally rounded to the front and back, compressed considerably on the sides, so that their basal outline is elliptic, and the compression and annulation extend to within one and a half inch of the tips. In a very perfect specimen now before me, there are twenty-seven rings, which go entirely round the horns, each ring being separate and distinct, and the longitudinal striation too faint to impair the continuity of the annulation. In the younger specimen, the compression of the horns is very trifling, and the rings, larger in front than elsewhere, are only six or seven in number; the animal being rather more than a year old. To proceed with the description of the mature male of the species, I may next note that the neck is rather thin, the body short and compact, the limbs long and exquisitely fine, the low hoofs compressed anteriorly, wide and rounded posteriorly, and that the false hoofs are large, but obtuse and adpressed. The tail is a mere rudiment, depressed, broad, triangular, entirely nude below, and furnished with radiating hairs, about one and a half inch long, on the sides and tip. The pelage or fur offers no peculiarity, consisting of hair only, neither fine nor very coarse, and of equable length of about one and a half inch. The skull presents the Cervine and Antelopine, not the Ovine and Caprine* form. There is no trace of suborbital, of superorbital, of maxillary glands or pores, nor of moist muzzle, nor of inguinal pores; and the interdigital pores, though distinct, are small. The females are hornless, and have only two teats, which are perfectly developed in the males also. There are no tufts to the knees, nor any of those marks upon the face, flanks, and limbs, which are so frequent among the antelopes. In regard to colour, my two specimens, which were brought here in November, and killed, no doubt, in summer, exhibit above and laterally, a dull and somewhat purpurescent-brown, freckled with hoary, owing to the pale fawn tips of the hairs, and below rufescent-white, which colour likewise is extended all over the limbs, over the insides of the ears, the back parts of the head (in the old animal), and the postea! margin of the buttocks, whence it spreads like a small disc round the tail, becoming also more rufous there; and thus the tail, which is black itself, assumes that contrast of colours that has suggested the specific name—*Picticaudata*. Dr. Campbell's specimen of a female is paler in colours than my males, the superior surface being hoary-blue or canescent-slaty; and as such, is the winter hue of so many other Tibetan ruminants; it is probably also that of the *Góá*. I have said that the limbs are entirely colourless; but there is, especially in

* See Journal Asiatic Society of Bengal, No. 111, for 1841.

young animals, a faint list of colour passing down their outsides to the hoofs. This species is said to be totally void of caprine odour in the living state. The skins certainly are so. The small testes are lodged in a neat hairy scrotum, and all the adjacent parts, including the groins, are entirely clad in hair, there being no trace whatever of those sinuses in the groin which are so highly characteristic of the most typical genera of the antelopes, that is to say, *Antilopa et Gazella* of the moderns. Still the Góá, in my judgment, is closely and essentially affined to the antelope group, by the extreme delicacy of its form; by its manners; by the cervine shape of its skull; by its black, round, and ringed horns;* and lastly, by the absence of caprine odour, notwithstanding that its structure, according to modern views, is caprine, not antelopine: and, in fact, it is throughout structurally a true *Capra* of Ogilby, save that the females are hornless. This character, together with the others just mentioned, forbid me, however, to class the delicate graceful Góá with the goats proper, whilst the ovine nose, and the want of suborbital as well as of inguinal sinuses, renders it impossible to range our animal with the proper Antelopes or Gazelles, though it is more nearly affined to the latter than to the former. The ovine nose seems to me a very important character; and Mr. Ogilby, when he classed the antelopes proper, typed by *Cervicapra*, in a family characterised by '*Rhinaria nulla*,' ought apparently to have given them as a subordinate and generic mark '*Rhinaria parva*,' because the nude moist muzzle is a material diagnosis, very decidedly forthcoming in the Antelopes, less so in the Gazelles. Col. H. Smith considers that Mr. Ogilby has laid undue stress upon the interdital pores as a generic character; and yet Mr. O's. most accredited predecessors in classification had insisted upon the presence or absence of *this* character, *together with that of the suborbital pores*, as constituting the distinctive marks of *Ovis* and of *Capra*. True, they were in error in this instance, for goats *have*† interdital, though not lachrymary, pores, and consequently Mr. Blyth's suggested genus *Ammotragus* is based on misconception, though accidentally true to nature, at least in my view of her, and without reference to systems. But, however falsely used heretofore, still it does not follow, that each of these characters (the pores) is not of importance, and there can be no doubt that either of them may be rationally presumed to be so, and to affect the conditions of existence, the habits, and economy of the animals; whereas, several of

* The form of the horns is rejected from modern definitions of genera, and wisely so *quoad* the particular flexure. But still I incline to the older notion that round, black, and ringed horns, as opposed generally to grey, angular-keeled, and nodose horns, serve well to indicate Antelopine or Caprine tendencies.

† Mr. B. expressly says *not*, and thereon founds his genus. Let him look at nature instead of books, and he will see his error.

Col. Smith's proposed diagnostics of genera have no pretensions to be so regarded.

With regard to the specific distinctness of the Góá, there must remain some doubt, until its essential and trivial characteristics, as above given, have been compared with those of the species it most resembles. Books cannot well be trusted on this head, and the whole of my collections have been deposited in the British Museum. The size and proportions of the Góá are quite those of *bennettii*, and both species are alike distinguished by black tails and horns of somewhat similar form. But the difference of habitat, of pelage, of colour, the inguinal pores, knee tufts, and females horned of *bennettii*, not to mention differences of detail and of size in the horns and tails, sufficiently distinguish this species from the Góá. *Antilopa arabica*, or the Ariel, has (like *bennettii*?) the structure of a true Gazella of Ogilby, which at once suffices to prove its distinctness from our species, not to dwell on diversities of colour, manners, habitat, &c., all very obvious. Lastly, *gutturosa*, or the Dseren, is a much larger animal,* with much smaller horns; and its suborbital pores, its knee tufts, its protuberant larynx, and glandular preputial bag, are all marks impossible to be mistaken, and not found in the Góá.

The following are the dimensions of a fine old male of the Góá :

Snout to rump,	3 7
Height at shoulder, ..	2 0
Head to occiput,	0 8
Head to base of horns, ..	0 6
Tail,	0 0 3-4
Ears,	0 5
Fore-leg, top of cannon-bone to end of hoof,	0 9 1-8
Hind-leg, ditto ditto ditto,	0 10
Horns, length by curve, ..	1 1
Ditto ditto, straight,	0 11
Ditto, greatest divergence,	0 4 3-10
Ditto, basal interval,	0 0 4-10
Ditto, terminal interval,	0 4 3-10
Ditto, periphery of base,	0 †

On the Wild Sheep of Tibet, with plates.

CAPRIDÆ.

Genus.—OVIS.

Species.—O. AMMONOIDES MIHI.

In No. 111 of the Bengal Asiatic Journal for 1841, I have described two species of wild sheep belonging to the Himalaya and Tibet. Having recently received a splendid specimen of the male of one of these species, I recur to the subject with a view of more fully fixing the characters of this animal, whose close affinity to the Argali of Pallas renders

* The Dseren is 4½ feet long, and 2½ feet high. Horns 9 inches.

† Sic in MS.—EDS.

it somewhat difficult of satisfactory discrimination. To Dr. Campbell's kind arrangements in my favour, I am indebted for this specimen, as well as for the Góá, which were all received in November and killed in the summer, and hence exhibit the summer dress of the animals.

The present specimen of the *Ovis ammonoides* is that of a male of eight years, and having the scull and members complete, and being otherwise in perfect condition; it displays the characteristics of the species in a most satisfactory manner.

This magnificent species of sheep measures from five and a half to six feet in length, exclusive of the tail, and from three to three and a half feet high at the shoulder. My undistorted specimen, as laid simply on the table, gives the former dimensions, and the latter, with a slight degree of tension. The head to the occiput (straight) is seventeen inches, and twelve inches to the base of the horns. The tail is but two and a half inches long, or three and a half with the hair; and the ears are four and a quarter inches. The horns, by the curve, are above three feet, and they have a basal girth of fifteen inches; the age of the animal being eight years, as marked on the horns. The stately and rather large head, has great breadth, and still greater depth at the insertion of the horns, and is thence gradually narrowed to its fine nasal extremity. The forehead is concave,* exhibiting a considerable dip from the crest of the frontals to the fore-angles of the eyes. The chaffron is straight, or arched only in the slightest degree. The nostrils of the ordinary ovine shape, have their mere margins, and a confluent stripe down the front of the upper lip, nude. The eyes are of medial size, and beneath them are the usual lachrymal sinuses, deep but immobile, and of good size, but hid by hair which clothes them inside and out. The ears are small, narrow, pointed, and striated. The massive horns are inserted obliquely on the top of the head, considerably behind the orbits and in contact. They are triangular and compressed, having nearly twice as much depth as breadth at the bases. Their frontal aspect, which is presented directly forwards, is flat, and is extended nearly to their tips with gradually diminishing breadth. Their dorsal aspect is in general, cultrated, but widened roundwise towards their bases. Their lateral aspects or sides are, the inner one, nearly flat, or somewhat concaved, and the outer one more plainly convexed; and thus, though the trigonal form of the horns is decided, it is not perfect; the outline of the base being ovoid.

* Cuvier says, *Ovis* has a convex, *Capra* a concave, forehead; and he even makes generic marks of these peculiarities. But in Cuvier's day, genuine wild specimens of either genus were too rare to admit of just discrimination and definition of generic characters.

The transverse wrinkles are very numerous and conspicuous, exhibiting on the frontal surface a succession of large ridges and furrows: on the sides of the horns they are much less developed, particularly on the inner side, and they gradually diminish from the bases of the horns to the tips, the last five inches being void of them. The curvature of the horns describes a fine backward and outward sweep, and thence downwards and forwards, so as to complete about two-thirds of a circle, when there is a second retroversion, leaving the points directed forwards and outwards with an inclination backwards, as though, in old age, there would be a second spiral curve. The neck is rather thin, the body full, and somewhat elongate; the limbs elevated, clean, and strong. The hoofs, which are very fine, hard and black, are less deep and perpendicular than in tame sheep, and rest on longer laxer pasterns. The hoofs are compressed and scooped beneath anteriorly; broad, full, and rounded posteriorly, or in the position of the *frog* of solid ungula. The false hoofs are large, but not salient or pointed, being blunt tubercles rather. All the four* feet have interdigital pores of good size, in which some cerous matter is lodged. The small stag-like tail is cylindric-conic, clad beneath towards its tip, and scantily furnished with hair, which seems as though it had been rubbed off.

The pelage, or vesture, consists entirely of hair, without a trace of wool beneath it. The hair is of the usual coarse, brittle, quill-like, and internally wavy character, and on the body generally is only three-quarters to one inch long; on the under-surface of the neck two and a half inches, and on the limbs and head is close and fine, with not half the length it has on the body. The elongation of the hair on the abdominal surface of the neck, extends from the throat to the chest, and is distinct upon close examination, but not otherwise, for there is no appearance of a pendant mane. The colour on the dorsal surface of the animal is saturate dull-brown; on the flanks, entire head and neck, and fronts of the limbs, the same, but mixed largely with hoary, so as to create a pepper-and-salt hue almost; on the belly, insides of the limbs, margins of the buttocks, tail, and a large disc round it, rufescent-white. There is no black or dark stripe down the vertex; but the highest part of the body is the darkest, and is nearly black, the colour being extended in a line to the tip of the tail, so as to divide the white disc and tail in a

* I am thus particular as to this organ, because there is much yet to be learnt about it in regard to all the Ruminants: for example, the Mantjac of the Sub-himalayas (*Cervus ratwa*) has these digital pits only in the hind-feet, and the Saumer (*Cervus aristotelis*) is devoid of them entirely, though the best books say otherwise. I speak by virtue of old memoranda, having no specimens of these deer now to refer to; but those I examined were *alive*, and I think I noted carefully.

notable manner, though the disc itself be vaguely defined. Such is the summer garb. In winter the dark hues are much paler; the back and flanks being slaty-blue internally, but canescent-fawn on the surface. The female of this splendid species is worthy of her mate, being little inferior to him in size, and provided with a fine pair of horns. I possess two good specimens respectively, of eight and nine years old; and, as a very slight degree of tension applied to the skin of the larger, (which is not distended in the curing) gives five and a half feet for the length, and three feet for the height of the animal, I apprehend that the male cannot be less than six full feet long, and three and a half high, and consequently, that six and five and a half feet, and three and a half and three feet, may be safely assigned as the respective sizes of the sexes in length and height. These females were killed, like the male, in summer,* and they resemble him in colour and aspect so closely, that it becomes only necessary to add to the subjoined details of dimensions a notice of the female horns. The horns, then, have the same characteristics as those of the male, but softened and exhibited on a smaller scale. They are, in fact, about half the size of the male's horns, but being less curved, they make a greater longitudinal show in proportion to the size than his. Their thickness, like their length, is about half that of the male's horns. They are very much smoother, and by their diminished thickness, they are separated at the bases. Their flat frontal aspect is not extended far up, owing to the greater compression of the horns; but that aspect, being presented directly forwards, as in the male, is very palpable towards the base of the horns, which ascend with a sickle-like bend upwards and outwards, greatly divergent, but not describing more than a half of the concentric or circular curve. Thus their points are bent down with yet a faint indication of the second retroversion, so that there is a slight obliquity outwards of the blunt downward tips. The suborbital and interdigital sinuses are very distinct in these females, but the caudal disc less so than in the male. Their tails are *very* short, and the chaffron of the females is perfectly straight, from the setting on of the horns to the nose. The teats are two.

The following are the detailed dimensions of both sexes:—

	<i>Male.</i>	<i>Female.</i>
Length from nose to anus,	5 8	5 4
Height at shoulder,	3 2	2 10 $\frac{1}{2}$
Head to occiput,	1 5	1 2
Head to base of horns,	1 0	0 11

* One of the females still retains enough of the winter garb to show that the winter colour of the species is slaty-blue, overlaid on the surface with fawn, or pure fulvous. In the summer garb the dark or black-brown of the upper-parts is extended very low on the flanks, behind the elbows; and the dark list down the limbs is very palpable, though much mixed with hoary.

Head, width of, between the outer margins of orbits, .	0 8	0 7 $\frac{1}{2}$
Head, depth of, from frontal crest to lower edge of jaws,	0 9 $\frac{1}{2}$	0 0
Head, length of, from nose to fore-angle of eye,	0 9 $\frac{1}{4}$	0 8 $\frac{3}{4}$
Fore-leg, top of cannon-bone to tip of hoof,	1 2 $\frac{1}{2}$	1 0 $\frac{1}{2}$
Hind-leg, ditto ditto,	1 4 $\frac{1}{2}$	1 2
Ears,	0 4 $\frac{1}{2}$	0 4 $\frac{1}{2}$
Tail only,	0 2 $\frac{1}{4}$	0 1 $\frac{1}{4}$
Tail and tuft,	0 3 $\frac{1}{4}$	0 2 $\frac{1}{4}$
Length of fore-hoof,	0 3 $\frac{1}{4}$	0 3
Breadth of ditto,	0 2 $\frac{1}{4}$	0 2
<i>Horns.</i>		
Length by curve,	3 1	1 7 $\frac{1}{4}$
Basal, depth of,	0 6	0 2 $\frac{3}{4}$
Basal, width of,	0 3 $\frac{3}{8}$	0 1 $\frac{1}{2}$
Basal interval,	0 0 $\frac{1}{4}$	0 1 $\frac{3}{8}$
Terminal interval,	1 8 $\frac{1}{2}$	1 3 $\frac{1}{2}$
Circumference of base,	1 3 $\frac{1}{2}$	0 8

Remarks.—No great while ago only two or three species of wild sheep were recognised by men of science. But Mr. Blyth has all at once produced a splendid cornucopia of species,* founding many of them however, upon an inspection of the horns solely. I question the possibility of so establishing species or genera in this group; and, as a proof of the necessity of examining carefully the *entire structure* of the animals, I need merely refer to Mr. Blyth's signal error, already adverted to, in reference to the organization of *Capra* or the domestic goat, and to an oversight equally important to be mentioned presently. A strong conviction of the necessity of extreme caution in the examination of the *Capridæ*, while it must serve as an apology for the tediousness of the present paper, will, I trust, by its results, enable those who are in possession of Pallas' *Ovis ammon* and Dseren, to determine whether I have, or have not, justly made out the distinctness of my *ammonoides* and Góá. In further proof of the necessity of extreme caution and of research carried into the entire structure of the *Capridæ*, I may mention that my *Ovis nahoor* is, like *Tragelaphus*, devoid of the sub-orbital sinus, whether in the skull or skin. In drawing up my original description of this species, I too easily presumed that these organs were forthcoming; but in my amended description I noticed the absence of all trace of them in the skull, though still without advertence to the skin. Further conversancy with nature has, however, since then given me a greater distrust of books, and, having recently procured a fine specimen of the Nahoor, I ascertained beyond a doubt, that the animal, though possessed of interdigital, is entirely devoid of suborbital, pits. Simultaneously I obtained two specimens of Mr. Blyth's *Ovis barhal*, and found them also provided with interdigital, but wanting suborbital, sinuses, as in the Nahoor, from which species I now incline to regard

* Proceed. Zool. Society, August, 1840.

the Barhal as distinct. And, as these round-horned sheep, void of the lachrymal pits, unmaned, and furnished with a well developed tail, appear to form a natural group, distinct from the Argalis, and from *Tragelaphus*—also a separate type apparently, however misdiscriminated by Mr. Blyth,—I beg leave to suggest for this group the generic appellation *Pseudois* ($\psi\epsilon\upsilon\delta\omicron\varsigma$ et $\omicron\iota\varsigma$) lest, as has too frequently happened to me, some closet systematizer, who never was at the pains to examine nature for himself, should step in “to name and classify” (the work of a moment, *as ordinarily done*.) my discoveries. The Argalis and *Mouflons* (not to mention the *Tragelaphi*) seem to form two striking groups among the wild sheep: our Nahoor is a complete *Moufflon*: hence it occurs to me to ask, if the Corsican animal is, like the Himalayan, devoid of suborbital sinuses? This query may seem presumptuous; but any one who will refer to the Proceedings of the Zoological Society for March 8th, and November 8th, of 1836, may satisfy himself that this sort of analogical inference led me justly to determine, without having seen it, the structure *quoad hoc* of an animal (*Cambing útan*), which the learned of Europe had long been in possession of, and yet had mis-stated that structure. To come nearer to the point, Mr. Blyth, a professed naturalist, even while writing a monograph on *Ovis*, and insisting on the distinctness of his *Ovis barhal*, has entirely neglected to notice that striking structural peculiarity, the absence of the suborbital sinus. Should the Barhal and the Nahoor prove to be distinct species, and I now think they may, we shall have, already, two types of *Pseudois*, and I suspect the *Moufle* will make a third. Mr. Blyth’s industrious researches indicate at least, if they do not prove, the existence of many wild species, which, if substantiated, will doubtless be found to present several peculiarities of organization of generic or sub-generic value. That gentleman is still sanguine as to the discovery of more new species: but I cannot agree with him, when he insists that none of his numerous wild species can be regarded as the type of the tame animal, *because* all varieties of the latter exhibit long tails. Now the several varieties of the tame sheep in the Sub-himalayas and Tibet, six in number, as known to me,* have all of them short deer-like tails, and some of them in the form of their horns resemble *ammonoides*; and all, like *ammonoides*, possess the feet and eye pits. The Highlanders have such a horror of long-tailed sheep, that they will not even let them graze in their fields! Wherefore, Mr. Blyth has not far to look for tame sheep with short tails.

* The Húnia, the Pélúk, the Silingia, the Barwál, the Cágia, the Hálúk.

Notice of the Nicobar Islands, by the Reverend P. BARBE.

The Nicobar Islands, lying between the sixth and tenth degrees of north latitude, have for sometime attracted very much the attention of the public in India, not so much on account of the productive qualities of their soil, but because of the Islanders having committed repeated murders on the crews of several vessels under the British Flag. Vessels sailing from the Coast or from Penang have, for a long period of years, touched there during the NE. monsoon to take a cargo of coconuts, as do also large China junks, Malay prahus, and Burmese boats from Bassein, Rangoon, and the Tenasserim Coast. Not a single year has passed without hearing of some vessels or boats being lost. But as no one suspected the Islanders to be capable of piracy, the loss was always attributed either to bad weather or to the incapacity of the captains. It is but a few years since Government has been convinced, that the Nicobarians, although destitute of real courage and bravery, have been guilty of the greatest crimes, in murdering peaceful people, who could not suspect that the natives, whose appearance is so simple and timid, would ever conceive and dare to execute such treacherous designs. So there is very little doubt now, that a great part of the vessels which were supposed to be lost in the Bay, have been cut off and plundered by the natives of these islands, and their crews found there a watery grave.

The various islands forming the group of the Nicobars are Chowry, Teressa, Bompka, Tilhanchong, Karmorta, Nancowry, Katchall, Car-Nicobar, the Little Nicobar, the Great Nicobar, and some other smaller islands. The SW. monsoon begins in the latter part of May and lasts till October. During that period, rain falls in great abundance, and the wind blows hard: there is a heavy swell, and it is dangerous to approach the islands. Few vessels touch there during that monsoon; but in the NE. monsoon, vessels, and Burmese, Chinese, and Malay boats are seen there taking a cargo of coconuts, betelnuts, and collecting birds' nests, trepan or sea-slug, ambergris, tortoise-shell, &c. They give in barter black and blue cloths, coarse handkerchiefs, red cloth, cutlasses, Burmese daws, silver or German silver spoons, ardent spirits, tobacco, red woollen caps, old pantaloons and jackets, black hats, &c. When a vessel reaches the place, the people of the village contract for supplying a cargo

in so many days, and they seldom fail to fulfil their engagement; they take in advance generally the goods given in barter.

The Nicobarians are not very expensive in their dress: a small piece of blue cloth, from three to four inches broad, and four or five feet long, tied round their loins, is the covering of a man; sometimes they encircle their heads and loins with young branches or grass. When the headmen of the villages go on board the vessels, they are more decently clad; they have a black hat or red cap, coat, jacket, pantaloon, &c. The women in opposition to the custom of persons of their sex in other countries, shave their heads, wrap round their loins grass tied with a string, about a cubit broad; and on great occasions a piece of blue cloth over the grass. When they appear in public, they generally cover their breasts. Men and women use so large a quantity of betelnuts, lime, and betel leaves, that their teeth are as black as ink; and the space between them, being filled with that matter, they appear as a solid piece, much like the horn invested in the jaws of the tortoise.

It is very difficult to have an accurate notion concerning the origin of the Nicobarians. They have projecting cheek-bones, flat visages, flattened nose, scanty beard, straight black hair, and Chinese eyes. Their complexion is dark-olive; they are corpulent, muscular, and well-made; but their legs are rather short in comparison with the trunk; the lower extremity being more developed than the upper one. Their general size is from five feet to five feet two inches. But the inhabitants of Chowry are of a darker complexion, more muscular, and have an air of independence, which is one characteristic mark of the Burmese. I saw some men and women at *Teressa* belonging to Chowry, and judging by them, the general height of these Islanders must be from five feet five inches to five feet ten inches. Although these people appear to hold some relation to the Malays on account of the resemblance of many of their features, yet the shape of their eyes, their manners, religion, language, and many characteristics are so different, that they must be considered as a particular race. The Malays having not settled there, the Nicobarians have preserved the pure blood of their ancestors. I am not far from thinking that they belong to the same race of people who formerly lived on the sea-shores of Sumatra. When the Malays settled in the island, they took possession of the whole of the level country, and compelled the *Battas*, the original inhabitants, who would not mix with

them, to take refuge in the interior of the island, so that race is now master only of the mountains.

There is a tradition amongst the Nicobarians, that the first stranger who came to their island, seeing something moving on the sand, perceived small persons of the size of an ant. He took care of them till they attained the common size of men, so began the origin of the Nicobarians. According to another tradition, a man sprung out from the ground, and taking a bitch for his wife, had two children, who, in the course of time, peopled the island. A man murdered was buried, and from his head sprung the first cocoanut tree; sometime after all the inhabitants were destroyed by an inundation, with the exception of one man and one bitch, who again peopled the island. In the course of time a vessel having a prince for captain, visited Teressa, who on his landing was murdered by the inhabitants; his wife was taken on shore, and treated with the greatest respect, but the spot on which was shed the blood of her husband, being always before her eyes, she was very unhappy. On one night she was advised in a dream by her mother to remove that bloody spot from Teressa: she did so, and then Penboka was separated from that island.

The inhabitants of Teressa believe that the people of Nancowry are the descendants of Malays, who, visiting in their fishing excursions that island, lost their boats and settled there. The Car-Nicobar people are, according to them, descendants of the Burmese, who in a revolution which took place in their country, were obliged to run away from the Tenasserim Coast, and landed at Nicobar.

The dialects spoken by the Islanders differ more or less; and the difference does not arise only from pronunciation, but from a great many words which are not the same; so that the inhabitants of one of the islands can scarcely make themselves understood by the inhabitants of another.

The Islanders having no written language, the few words to be found at the end of this letter, have been therefore orally communicated to me. I wrote them as the sounds occurred to my ear; without presuming to say that I have succeeded in representing them correctly.

The Nicobarians shew great skill in the building of their houses and boats. Their dwellings are strongly built: they are supported by large posts, and are elevated above the ground from eight to nine

feet. The flooring, which is made of planks, has a circular form, and the roof, which has the shape of a bee-hive, is covered with grass called Lalung by the Malays, about a foot thick. They are without windows, nor have they any partition. The entrance is from below: these houses will last from ten to twelve years without repairs; and there is no other furniture but earthen pots, cocoanut-shells to carry water, a round piece of wood which they use for a pillow, spears, knives, swords, and the ika, which is their general food.

Their boats vary in size from six to twenty feet long, and from two to four feet broad, having an outrigging: they are generally safe: two or three poles support their sails. It is a pleasure to see how well these natives manage their canoes when meeting the surf.

These Islanders are lazy and inactive, cowardly, treacherous, drunken, and I am sorry to say, that crimes against nature are not unknown to them. Every evening the villagers meet in one of the houses, and there they spend part of the night in drinking, singing, and dancing. Like children, they desire every thing they see, without troubling themselves whether the object be useful or not. When a vessel arrives, the headman of the village in his best dress goes on board, accompanied by some other persons, whom he always calls his children. They offer to the captain young cocoanuts, yams, and plantains. If asked what they wish to have in return, their answer is—*Hahekienten man*, which means, 'You are my father.' Although they seem to have no wish for all that they see, yet they expect to get drink or something else. The headman then hands the certificate he has received from former captains. It is impossible to avoid laughing when the high sounding names of Byron, Smith, Rodney, Nelson, &c. are given to the bearers of the certificate. If a captain treat some of them very kindly, and make to them some presents, he is sure that some of the Islanders will be called after his name. In the year 1832, I saw at Rangoon two persons from Car-Nicobars; they paid a visit to the Italian Bishop who was there, and they were so much pleased with some trifle they received from him, that the old man told him, 'My name being Captain John, I cannot take your name; but my son not being Captain yet, he shall be henceforth called Captain Bishop.' The Nicobarians have different names. If they go on board an English vessel, they take an English name; if on board a junk, they take a Chinese name, &c.

The Nicobarians appear to have a great facility for learning languages. I do not mean to say, that they speak the languages very well; but they are able to make themselves understood in many. The Portuguese, spoken in Mergui, is their favourite language; and the respectable people of the different islands are more or less acquainted with it. The Malay is well understood by some of the people of Nancowry, and the Great and Little Nicobars; some of the people can speak a little English, Burmese, Chinese, Hindustanee, &c. &c.

In mentioning the character of these people, I have stated that they are treacherous, and as a proof of it, I shall relate the following facts:— In 1833, a Cholia vessel was cut off in the false harbour of Nancowry, and every person on board murdered. In 1839, the pilot of a Whaler being anchored at the same spot, the captain, some of the officers, and the greater part of the crew, were slaughtered by the natives. In 1844, Captain Ignatius Ventura, from Moulmein, commanding the *Mary*, anchored on the north side of Teressa, at two o'clock in the afternoon: one hour after, the captain and crew were murdered. In the same year, Captain Law met the same fate at Karmorta. Another vessel, three years ago, after having taken part of her cargo at Katchall, sailed to the false harbour of Nancowry to complete her cargo, there also the captain and crew were slaughtered by the natives. The headman of Katchall, who had given a part of the cargo to the above vessel, related the fact to me. He spoke in the highest terms of the captain of the said vessel, as likewise of Captain Ventura. I was well acquainted with the last mentioned person; he was most kind and honest, consequently incapable of provoking any person. But it appears that it was not so with the vessel first mentioned, they highly exasperated the natives by their conduct.

It does not appear that the Nicobarians have any exact idea of a Supreme Being. They say, it is true that there is a great spirit, whom they call *Reos*. But I suspect that this word they have received from the Christians of Mergui, who have been visiting these islands during the last two centuries: the words *Deos* and *Reos* are so nearly alike, that the one appears to be a corruption of the other. They admit the existence of spirits to whom they attribute sickness, death, and scarcity in the crops; they offer them pigs, fowls, &c. to propitiate them. Once in the year, and sometimes when great sickness prevails, they build a large canoe, and the Minloven, or priest, has the boat carried close

to each house, and there, by his noise, he compels all the bad spirits to leave the dwelling, and to get into the canoe; men, women, and children assist him in his conjuration. The doors of the house are shut; the ladder is taken out; the boat is then dragged along to the sea-shore, where it is soon carried off by the waves with a full cargo of devils; those malignant spirits are effectually prevented from taking their abode again in the village by a screen made of pieces of cloth, which keeps out of their baneful sight, the place where the houses stand. This feast, which takes place at the end of the SW. monsoon, is called by the Nicobarians *Kew Hivee*. In the beginning of the NE. monsoon, all the women are obliged to fast for three or four days. During that time, they dress as mad persons, and go from house to house singing and dancing. The Nicobarians have also in their houses idols of the most ugly shape, representing men and women; some with European dress, and some with the scanty dress of the natives. They have short and thin legs, and a large belly, and from their necks hang spoons, cocoanuts, &c.

The Nicobarians have such a high idea of the power of Europeans, that to them they attribute the creation of their islands, and they think it depends on them to give fine weather, nice breezes, &c. They are convinced that the *Minloven*, can cure every disease, make people sick, and also deprive them of life. Should any one be suspected of causing death, the villagers would immediately kill him: this has been the case several times. When the French Missionaries were living at Teressa, the villagers went to them on several occasions, saying: 'Senhor Padre, give us some rain if you please; our yams are dying, we know you can do it if you like.' And on one occasion, the priests were threatened to be murdered if there was no rain. On the following day, fortunately, a strong shower fell during the night, and the people thanked them most cordially. One of the clergy, being on board of their canoe in his way from Chowry to Teressa, the crew told him—'Senhor Padre, some breeze if you please': sometime after, the wind blowing a little fresh, '*basta*,' cried they, 'it is enough, do not give any more of it, otherwise the boat will be capsized.' One day, Gold Mohur, who is the most respected man of the Laxis, a village situated at Teressa, went to the Missionaries, telling them—'You think perhaps that the inhabitants of this place are bad people. I will convince you of the contrary; to-morrow I will

take all the inhabitants to you, and by examining their hands, you will see that there is not a single murderer amongst them.' When I was at Katchall, speaking to some of the people about the murder committed on board of vessels, every one of them showed me the inside of their hands, saying, 'Is there any spot of blood on them?' These people are convinced that Europeans, by looking into their hands, know if they have been guilty of some crime.

The population of the Nicobar Islands is from six to seven thousand souls. The whole of them live on the sea-shore : their villages, which are surrounded by cocoanut and betelnut trees, are small ; seldom more than three or four houses are seen on the same spot. The men have only one wife with the exception of those of Chowry island. The women enjoy the privilege of divorcing when they think proper ; so, should another man captivate their heart, they send away the first husband, and associate with the man who has been fortunate enough to please them. Not having children being considered as a curse, in that case the separation always takes place. I saw at Teressa, a woman who had been married on that account nine times. It is the custom for young people to live one year as husband and wife before the marriage ceremonies take place. Should they live on good terms, and be happy during that period, then the couple is united in the presence of the villagers, and of the Minloven. A feast is given to all the friends and relations ; large pigs are killed ; those that are invited daub their faces with the blood, &c. Should the husband die, the wife is seldom married again.

The women during their course, daub the whole of their body with the blood of pigs and fowls ; and they drink freely the water in which they have infused several roots. When *enceinte* dancing and singing are not allowed in their village ; nor can the relations sell pigs or fowls to make curry. When a child is born, it is a great rejoicing amongst them : they feast for several days. When a person is sick, they hang to his neck young cocoanuts, a spoon, and small carved figures, to amuse the spirit ; small baskets filled with betel leaves are suspended to the trees, and the Minloven is sent for. He never gives any medicine, but excites friction on the different parts of the body : he binds the members of the sick in different directions ; claps his hands, and makes a great deal of noise. He gives orders to the relations to cut some of the trees, and to tie to the posts of the house some of their

branches, with young cocoanuts. Should the person be in his last extremity, the Minloven gives a song of farewell. Friends and relations never cry at the death of a person : their mourning is in the shaving of their heads : the villagers go to the house where the corpse is, and there they drink till they are intoxicated. A coffin is made of a boat cut in two, and some hours after the death, the body is carried to the grave, on which they put cocoanuts and plantains ; the Minloven, taking wooden poles, goes to the sea-shore, and fixes them in the sand in such a manner, that when left to themselves, they fall ; he then takes them again and throws them in the sea : when he reaches the village, he makes a great noise, and the villagers throw out immediately the ashes they have in their houses. If the dead be poor, a few days after the burial the corpse is taken out from the grave ; they bring it to all the houses of the village, and from thence to the place where are the bones of the persons who died before him. They hang the coffin between two trees, six or seven feet from the ground : when the string is rotten, the coffin falls, and the bones are partly eaten by the pigs. Should the dead be one of the captains, the corpse remains in the grave for three or four months. Some people in their best dress go to call relations and friends from the other villages to remove the bones ; the pigs of the largest size are killed, and singing, dancing, and particularly drinking, are kept up for several days. When a person dies, the villagers cannot go on that day to the jungle, fearing to be killed by the Hivie or spirit : they abstain also from the food to which the deceased was partial.

The Nicobarians give credit to dreams ; and are much addicted to superstition. They will not cross a jungle carrying any box, nor will they use nails in the construction of their houses. They never bathe alone ; nor will they go to the burial ground ; nor will they cut large trees in the forest, before offering to the spirit, who resides there ; nor will they eat at the same meal, pork and turtle. When in their boats, after drinking the water of young cocoanuts, they are very careful not to throw into the sea, the shells. Before they build a house, the Minloven is called to choose the spot, and by different ceremonies, he compels the Hivie to leave the place. When a new canoe is to be launched, a fire is lighted round it to compel the spirit to quit the boat. These people have the idea, that some have it in their power to cause a person's death merely by thinking of it ; and should a villager dream

that such a one is doing so, there is no other means to escape but by going immediately to another island. The greatest part of persons seen in islands where they are not born, have been compelled to leave their own on this account. If the dreamer mention his dream to no one but to the heads of the village, the sentence is passed, and the eaters of men, as the Nicobarian call them, are taken and fastened to a tree close to the village, leaving them to perish by hunger: no friend, no relative, would give them any thing to eat. Some years ago, a young woman of *Teressa* was starved on that account, and it was but on the seventh day that death put a stop to her sufferings.

The Nicobarians never use any thing taken from a vessel on which a murder has been committed, before the *Minloven* has, by prayers and supplications, purified the articles; being under the persuasion, that if they did not resort to such expedients, the spirit of the murdered person would inevitably kill them.

In *Nicobar*, every one is his own master, even children. Persons who have been in foreign countries, are respected, and have some authority over their countrymen. Such is the case also with aged people, and persons who have a great number of cocoanut trees and many pigs. But there is not a single person in all the *Nicobars*, who has it in his power to exercise controul over, I will not say one of the islands, but even a single village, should a person be guilty of a grievous offence, or of repeated thefts, he is compelled to leave the island. Some years ago, a person who had been sent out of *Teressa* for robbery, returned thereto; and as he was following again his old trade, he was stabbed to death by the order of the head people of the village. I think that such occurrences are very rare, as it appears that there is a general good understanding and union amongst them.

The prevailing food of the Nicobarians are pigs, poultry, turtle, fish, cocoanuts, yams, *ika* and fruits.

The pigs, which appear to be derived from the Chinese breed, being fed on cocoanuts, are very fat, and their flesh is of a superior flavour. Although they are to be found in every island, *Teressa* is the place where they abound. Some of the villagers of *Laxis*, have as many as sixty or seventy. They are let loose in the jungle; the owner calls them every day by striking on a plank with a stick; on their hearing the noise, they run instantly in the direction of the shed where the cocoanuts are

kept. After they have fared on the allowance, which consists of two cocoanuts for each, they return to the forest. Although there are many sheds to which the pigs are called in the same manner, those brutes, however, never mistake the place where they have to look for their food. This mode of living, gives to those animals the appearance of wild pigs. I saw some of the young ones variegated, reddish, and whitish. A large pig is sold for four or five rupees; but if cloth or knives are given in barter, then it may be had at half that amount. White pigs are very scarce. I saw two at Teressa, and the owners would not part with them on any account. Should the authors of culinary books require a new system for cooking meat, I will gratify them with a receipt on that *imvigor* in use amongst the Nicobarians. Having killed the pig, daub your face with its blood, cut the animal in pieces, put it on the fire for one or two minutes, until the hair is burned off, then take off instantly and eat.

The fowls are scarce, and if bought with silver, they give but two or three for a rupee; but the same number may be had for a common table knife, old or new.

Although there is plenty of fish about the islands, the natives having no nets, catch but very few. Their only mode of fishing is with a basket and harpoon. Great skill is displayed both by old and young in using this instrument; seldom missing their aim. A part of the fish caught is generally eaten raw on the spot, and the remainder is taken home to the family to be eaten in the same plain manner.

Different species of turtle are found at Nicobar; amongst them is the imbricated turtle which furnish the tortoise-shell: the flesh being unwholesome, cannot be eaten. But it is not the same with the green turtle, whose flesh supplies good food, and whose eggs are fine eating: they are particularly common at Car-Nicobar. The natives take advantage of the time when the turtle deposit their eggs in the sand during the night, they approach them slowly, and turning them on their *carapans*, they leave them in that position till next day, when they carry them home. These turtles, lay about one hundred eggs at a time.

The group of the Nicobar seems to be the land of cocoanut trees. I have never seen any country where they grow so well and in such abundance; the water of the young cocoanuts is superior in flavour to any I have tasted elsewhere. If Providence had not provided those

islands with these useful trees, I know not what would become of the inhabitants ; and I am sure, that the greatest punishment which could be inflicted on them, would be the cutting down of these trees, on which they mostly rely for their subsistence. Having no rice, the nut is its substitute ; and the cocoanut water is their general drink. Being very lazy, they never climb up the trees to get the ripe fruit, but let them fall of themselves, leaving them at the foot of the tree till they are wanted. The only thing which can induce them to climb up, is to get the young cocoanuts, in order to obtain the water to drink or the toddy, which, when fermented, is an intoxicating liquor ; there is no house without a supply of it, and the first thing that is offered to a visitor, is a cocoanut filled with that stuff. Men and women indiscriminately climb the trees, except at Chowry, where none but persons of the fair sex enjoy that privilege.

The Nicobar yams have a particular taste and flavour, which they lose in part when transplanted in other countries. Although very little trouble and care is necessary for their growth, yet the Nicobarians, through carelessness and indolence, allow themselves to be deprived of that wholesome root, during six months in the year.

The *eka*, or *ika*, or *milor*, as it is called by the Portuguese, is a fruit of the size and shape of the jack ; weighing from ten to fifteen pounds. It grows on a tree which is from twenty to thirty feet high, the trunk is *funili formis, foliis pinearis*. The fruit being boiled, the edible part is separated from the filaments with a shell, which, for greater convenience (the women alone perform that work) is held between the toes. This being done, they make it into loaves, weighing from ten to twelve pounds each ; it will keep for several months. When the natives take their meals, they cut a slice of it, which being mixed with the kernel of the cocoanut, affords them substantial food. This bread resembles much in taste and colour the sweet potatoe. These trees grow in all the Islands.

The fruits the most common are plantains, papayas, and jacks. I have seen some oranges and sweet lime, but of an inferior quality. There is scarcely any marked difference in the soil of the various islands of the group ; and therefore what grows in one of the islands would equally be found growing in the other. To certain islands, however, is allowed by natives the privilege of growing certain articles, which is

denied to the other : thus Nancowry is the only island in which paddy can be sown, &c. These restrictions extend not only to planters but affect also tradesmen : for instance, boats are to be built at Nancowry : earthen pots are to be manufactured at Chowry : lime is to be burnt at Car-Nicobar. The Islanders are obliged to have recourse to the above mentioned places for those articles. This practice seems to be the result of a rather sound policy, the object of which is to establish, and keep up an uninterrupted intercourse between the people of those various islands. Who would have suspected the Nicobarians capable of so wise a political institution !!!

The Great Nicobar is remarkable for the height of its hills, rising in succession, and covered with thick jungle. The inhabitants are few in number, and for their having an almost continuous intercourse with the Malays, some of them are tolerably acquainted with their language. The captain of the Steamer *Ganges* paid a visit to that island, and having anchored his vessel in the bay on the south-east side of the island, proceeded in his boat to survey the river as far as twenty miles up. The soil appeared to him to be very rich, particularly on the left side. He saw some deserted huts and a few plantations of cocoanuts. In some places the river was very wide, and he never found less than two fathoms of water. He reached a place where there was a fence, about two feet high. A shed was erected inside, but the inmates having, it appears, heard the noise of oars, had all fled : on the fire was *ika* half-boiled, not in earthen pots, as used by the Nicobarians, but in the broad and thick leaves which surround the betel-nut, made in the shape of a pot. In the same enclosure were also pigs and fowls.

The interior of this island is inhabited by a race of people distinct from those of the Nicobars. It is said that this tribe is barbarous, and much inclined to warlike excursions to the great annoyance of their neighbours ; they are of a dark complexion, and have curled hair. It is a great pity that we know so little about a people, who having had hitherto no intercourse, nor the least communication with any other race, and being left to their own resources, could give us an idea of what man is when he has no other guide for his conduct, but the dictates of his vitiated nature. This tribe, with a dark complexion and curled hair, whether they are Papawans or Andamans, is a question

which no one could answer, except a person who had seen them both. Some persons have been brought from the Andamans to Penang, and no doubt has ever been entertained, but they are unquestionably of African extraction. I had occasion to see at Nancowry a man from Mozambique, who had seen several times persons from the Andamans, and who assured me that they were people belonging to the same race as himself. It is not to be supposed that the above mentioned person could have confounded two races so distinct as are the Africans and the Papawans. The hair of the last mentioned race grows in small tufts, each having a spiral twist. The forehead rises higher; the nose is more projecting from the face; the upper lip is longer; the lower projects forward from the lower jaw to such an extent, that the chin forms as it were no part of the face. This description given by Sir Everard Home, forms a striking mark of the dissimilarity between the two races.

* The Little Nicobar has a beautiful anchorage; the Steamer *Ganges* anchored opposite to a sandy beach, close to Pulo Beloo, at a short distance from the sea-shore. There is between the hills a beautiful valley, irrigated by a small river running from the south to the north; at the mouth of that river is a cave, in which numbers of the *Collocalia fuciphaga* build their nests: the bottom of the cave is filled several feet deep with guano. Coal has been found towards the northern point of the island; but it appears that the product would not pay the expenses of working it. The hills, which cover the interior of the island, may be estimated from one thousand to twelve hundred feet high. The sea-slugs called *trepan*, which is such a delicacy for the Chinese, abound in the harbour.

The beauty of the harbour, the safety of the anchorage, and the fertility of the soil, induced the Danish Government to choose this island for their head-quarters. The Steamer *Ganges*, which was bought for the use of the new colony, went in December last to Penang, in order to procure coolies; of the forty Chinamen taken on board, a part of them were unfortunately opium smokers; the consequence was, that when the supply of that drug which they had brought from Penang, was exhausted, being unable to procure any at Nicobar, they had no strength to go on with their work: after lingering for sometime, they fell victims to the deadly effect of that most pernicious habit. The remainder of the Chinamen have been employed in clearing

a place for the stores, and making roads; they have planted samples of sugar-cane, coffee, nutmegs, &c. It appears that the luxuriant growth of these plants exceeds the planter's expectation.

I entertain very little doubt, that the Danes will finally succeed in colonizing the Nicobar Islands; but great patience is required, and much money is to be expended for clearing the land. The fever, which attacks the natives, and particularly foreigners trading thereto, especially when they sleep on shore, is to be no doubt attributed partly to the dense thick forest covering the ground. Of the four French Missionaries who lived at *Teressa*, one of them died of fever soon after his arrival; a second one, after having been laid up with the same disease for more than a year, breathed his last at *Mergui*. The two surviving are still lingering under the same complaint, although they have left *Teressa* almost two years since. The natives of *Car-Nicobar*, when attacked with fever, rub themselves all over before a fire with hogs' lard. I do not know how far this remedy, which affords relief to those Islanders, would succeed with foreigners.

Should the Danish Government wish to go on with the colony, the best plan in my humble opinion would be, to employ Malays or Siamese to clear the forest; they are the people most fit for that purpose; the Chinese are most certainly the best cultivators amongst the Asiatics, but not being accustomed to the clearing of jungle, their work in that line would not compensate for the high salary which they receive. They, being accustomed to live on a good and abundant food, would certainly prove a heavy burden on a new settlement, such as the *Nicobar*, where provisions are, with so great a difficulty, to be had. The planters of *Penang*, having been annoyed by the importunities of the Chinese labourers, who are never satisfied with their present condition, have partly employed labourers from the *Coromandel Coast*; these coolies are a hard-working people, receive low wages, and are not impertinent towards their employers as the Chinese commonly are. It would be very easy for the Danish Government to procure labourers from the *Coromandel Coast*: rice and salt-fish being their food, they would be a lesser burden to the colony. Should Government take a couple of hundred Malays about the end of October, they would be able to cut down a considerable extent of the forest before the end of January: then their services might be dispensed with. In March or April fire could be set to the

wood, then fully dried up; this being done, the planting could commence. There is very little doubt, but the clearing of the jungle will put an effectual stop to the Nicobar fever. When the English took Arracan from the Burmese, that place was for some years called the grave of the troops; but the jungle having been cleared up to a considerable distance from the station, it is at present as healthy a place as any station in Bengal.

Province Wellesley, on the western coast of the Malayan Peninsula, was so unhealthy twenty years ago, that a European would not venture in the interior without being almost certain of catching the jungly fever; but the province having been in part cleared of jungle, it is considered by Europeans to be as healthy as Penang Island.

To colonize the Nicobars, a good manager is absolutely necessary, and much money must be expended at the commencement, and as all depends on the beginning, so the Government should be prepared to supply the settlement with means adequate to the undertaking. Should the establishment be properly managed at first, there is no doubt but the Malays and Chinese would go and settle there with their families, and cultivate the ground on their own account, as they do in English settlements; but on the contrary, were the Danish Government to go on slowly to the work, then the present settlement will be a failure, as was their first one at Nancowry. Nothing is to be expected from the natives; they are too lazy; they will never work except by compulsion.

The Nicobarians are averse to Europeans settling in their islands; this I heard from the most respectable of the Islanders, and but lately they gave a proof of it by making an attempt on the Government establishment. The natives being without courage, and not having among them a person who could succeed in forming them into one compact body and direct their united efforts, little fear is to be entertained about their future desultory attacks.

The sight of the south-west entrance to Nancowry harbour, affords a magnificent spectacle, and inspires the soul with emotion and pleasure. The passage which is about one hundred feet wide, has on each side a bare and rugged rock, having in the centre an opening much resembling the side gates of a citadel; these rocks lie adjacent to the hills rising from two to three hundred feet above the level of the sea, and are covered with a fine and ever-green vegetation; on entering the harbour,

which appears as a large basin, the eye meets with some hamlets surrounded by cocoanut and betelnut trees; many of the houses are built like the Malay huts, and some have the shape of bee-hives. The whole circumference of the harbour is lined with hills varying in shape, size, and height: some rising in the form of inclined planes, some towering perpendicularly; and some having several escarpments; these hills, from four to five hundred feet high, are covered with luxuriant vegetation. In vain the eye seeks for cultivated ground to embellish the scenery; nothing is to be seen but the savage grandeur of a vigorous vegetation, which characterises this part of the world. The harbour communicates with the sea by another entrance towards the east, which is the general passage for vessels to get in: there stands a village called Malaca; when vessels anchor close to it, both of the passages may be seen.

The inhabitants of this village, which has ten or twelve houses, are far from making a favourable impression on the visitor. By their features the Nancowry people resemble the Malays so much, that they appear to have some of the Malay blood in their veins; and there is no doubt, that if they rightly deserve to be considered as the wickedest amongst all the inhabitants of the group, it is owing chiefly to their frequent intercourse with the Malays. Some days previous to my arrival at Malaca, a young East Indian, William Goldsmith, who had resided there several years, died in that village. On enquiring about the particulars of his death, I was far from being satisfied with their contradictory, and on all respects, unsatisfactory answers. This young man must have known a great deal about the doings of the natives: it is not therefore improbable that his death had been hastened by the suspicious Islanders who feared he might make known their mischievous deeds. In the same village an African Christian, named John, who speaks tolerable Portuguese, and was employed as gunner by the Danes when they were in that island, came on board dressed with a miserable rag which the natives wear around their loins, he had for a neckcloth a fine pantaloons, which he received a few days before from one of the Danish officers. I put several questions to him concerning the inhabitants, but in vain; he only told me that the natives were very good, with the exception of the inhabitants of the False harbour.

The first Danish settlement was at Karmorta, opposite to the village of Malaca; the remains of a few brick houses may be seen still on a

rising ground. I do not think that the spot was well chosen for an European settlement, the harbour being surrounded on every side by hills with the exception of the two entrances. This site must have proved unhealthy to the settlers; the low ground is very sandy, and the soil appears to be inferior to that of Nicobar.

Teressa Island appears to be ill adapted to be the head-quarters of a colony; the south of the island being an open place without a harbour, is too much exposed to be a safe anchorage, the surf is tremendous, and the only place for landing, is a small passage amongst sweeps. The breakers in the NE. monsoon are also terrific. The northern part of the island is partly protected by Bombaka, a small island, distant two miles from Teressa, the hills of which rise suddenly from the beach; but that side being exposed to an easterly gale, the anchorage is not safe. The low ground of Teressa is very sandy, and although the hills are composed of red clay, they are covered in part by a coarse grass called *Lalan*, and the vegetation does not appear to be so strong as in some other islands. *Lackshee* is the largest village in the island: it is situated towards the south, and contains seventeen huts, numbering one hundred and four persons. It is in that village that the French Missionaries dwelt, living in a native hut. The Islanders would not allow them to build a house, although they had brought the materials from Penang; being under the ridiculous impression, that if a house were built different from theirs, they would all inevitably die. The Car-Nicobarians have not those prejudices, having allowed the Missionaries to build a house in 1836 in any shape they thought proper.

The Missionaries entertained at first great hopes of converting the natives; the Islanders visited their houses frequently, and though they did not appear to take much interest in their instructions, it was thought that this might be attributed rather to the unsteadiness of their character than to any determined aversion to their becoming Christians.

The priests on becoming better acquainted with their character, found that the trifles they had brought with them to the Nicobars, were partly the cause of the seeming affection shewn to them at the beginning. A school was opened by the Missionaries; as children do what they please, and parents having no controul over them, the school was attended only by a few, and that for a very short time, so that not a single boy could derive any benefit from it.

The Jesuits, about two hundred years ago, were the first who brought to those Islanders, the light of the Gospel: their exertions were crowned with success at Car-Nicobar, but these Missionaries being anxious to give the same benefit to the other islands, went thither on that purpose. Their zeal was rewarded with the crown of martyrdom. The neophytes being left to themselves, fell again into their former paganism.

In the beginning of this century, an Italian clergyman was sent from Rangoon to Car-Nicobar, his zeal, charity, and simplicity of manner in his living, gained him the hearts of the natives; several of them were baptized; and there is very little doubt, that the whole island would have been converted, had he not caught the fever, in consequence of which, he had to return to Rangoon, where he died shortly after his arrival.

In 1835, two French clergymen were sent by the Bishop of the Straits to the same island. The natives were shy at first, but after a few days of intercourse, they shewed a more friendly disposition, and allowed them to build a house. The Missionaries found that their frequent communication with foreigners was far from having improved their manners. They were no more that simple, innocent, and harmless people as they were formerly represented to be. When the natives became more acquainted with the missionaries, they paid them frequent visits; bringing with them trifling presents, such as yams, fowls, &c., some of them being anxious to learn the Christian religion, went every evening to their house to be instructed: after a few months' residence there, the priest had gained so much the affection of the people, that their house was crowded every day; and they were permitted to visit all the parts of the island without excepting even their inland establishments, where they keep their most valuable articles: a privilege which had never hitherto been granted to any foreigner. Every thing went on prosperously, until the arrival of a Cholia vessel, whose *Nakoda*, by misrepresenting the character of the priests, withdrew from them the confidence of the natives. He told them, that the Missionaries were English spies sent there, for the purpose of enquiring into the produce of the country, and that in consequence of the information furnished by them, that Government would soon take possession of their islands. The Nicobarians having given credit to this tale, would hold no more communication with them nor sell them any provisions: two of the natives who

continued faithful to the Missionaries, told them that the people were so exasperated against them on account of these false reports, that if they remained any longer, there was no doubt, but they would become victims to their rage. As the Missionaries could not succeed in convincing the Islanders of the untruth of the report, and seeing that any further stay among them was useless, they quitted the place, having remained in the island about a year. It is impossible to form an adequate idea of the hardships which the Missionaries underwent during their stay in the Nicobar Island. They were deprived of every comfort of life ; their food frequently consisted of nothing but cocoanuts and yams. The Rev. Mr. Lacrampe, who spent the SW. monsoon at Chowry, had no rice to eat during his stay ; and had it not been for a native who brought him one yam every other day, and which he was obliged to share with a servant boy, he would have starved. This gentleman being attacked with fever, cocoanut-water was the only drink he could procure to quench his burning thirst. The Rev. Messrs. Chopard and Borie, soon after their arrival, were taken ill at Teressa, and so seriously, that they could not render each other assistance : both were lying on mats in the same place, without remedy, and receiving no assistance from the natives, but the hand of Him who had guided their steps in that foreign land, supported them amidst such trying afflictions. At last Mr. Borie, though of a strong constitution, fell a victim to repeated attacks of fever. On that very day, in the evening, Revd. Mr. Chopard was so very ill, that he was not at first aware of the death of his companion. On the following morning, having recovered his senses, he then only found that his friend was but a corpse lying by his side. On the same evening the natives removed the mortal remains to the grave they had prepared : and he, though scarcely able to creep along, attended the funeral. A worldly-minded person might mistake this pure zeal of the missionaries for blind fanaticism ; but their conduct cannot but be admired and praised, when we consider and reflect on the fact, that these missionaries were led by no possible earthly motives, but guided solely by the earnest desire of making known the saving truths of the Gospel to their fellow-creatures. Nothing but a belief grounded on the strongest evidence, and deeply rooted in their souls would have led them to the field of their labours, and supported them through the severest trials.

Chowry Island, seen from the east, presents a rugged and abrupt rock, resembling the walls of a citadel or old castle. The other part of the island is flat. Although cocoanut trees grow well there, the quantity is not sufficient for the support of the inhabitants; in consequence of which, many are obliged to proceed to other islands. The emigrants being generally men, it follows, that the female sex are more numerous; I suppose this is the cause why the privilege of having several wives is allowed in that island. No fresh water is to be had at Chowry; the inhabitants therefore have no other drink but cocoanut-water. Vessels or boats touch seldom at Chowry, because there is no safe place of anchorage; in consequence of which the natives are the poorest among the Nicobarians; and when they have to buy or sell any articles, they go to the other islands where the vessels are lying.

In all the group of the Nicobars are found, more or less, birds' nests, trepan, ambergris, and tortoise-shells. The first vessel that touches there, when the SW. monsoon is over, might make good bargains with the natives, provided the purchasers be well acquainted with the quality of the articles brought to them.

The *Collocalia fuciphaga* is smaller than the common Swallow, brown above, and whitish below. The nest is a whitish gelatinous substance, arranged in layers and secreted by the salivary glands of that species of Swift. These birds, common in the Archipelago of Mergui, the Nicobars, &c. build their nests in the cavity of the rocks, where it is most difficult and perilous to have access. The nests are of six qualities; the first, of a fine whitish colour, is obtained by taking the nest before the Swift has layed its eggs. This quality is sold at Penang from forty to fifty dollars the katee. The second quality of a brownish colour, is obtained by taking the nest when the bird has layed her eggs. It is sold at Penang at from twenty to thirty dollars the katee. The third quality is of a dark colour, mixed with blood and feathers, it is obtained by taking the nest when the young birds have flown; the price of this sort is very low. The Chinese say, that when the nest is taken before it is completed, the Swift makes another but of an inferior quality; and it appears that the bird exhausts itself in building the second; the next being spotted with blood. The manner in which the Chinese prepare the nest is to steep it in water during one night; then with great trouble they clean it; this being done, they boil it in water to which

they have added some sugarcandy, till the whole forms a jelly: one nest prepared in this manner, is sufficient for one person.

Birds' nests being very dear, the wealthy Chinamen only can enjoy this delicacy. The rich opium smokers take in the morning a cup of it, for the purpose of refreshing and strengthening their debilitated frames. Persons attacked by consumption, are advised by the Chinese physicians to take these nests; they prescribe the same to those who are reduced by a protracted illness; and I have seen several persons, who, having made use of this remedy, declared that they found a temporary relief from this refreshing and nourishing food.

Formerly, both Malays and Burmese, procured at the Andamans a considerable quantity of these nests: collecting them themselves, or receiving them from the Islanders in exchange for their tobacco, &c. I was told by an old Caffrey, who is still living, that when young he had been several times at the Andamans; that the inhabitants were then a harmless people; that they brought on board, trepan, birds' nests, &c.; taking in exchange several articles. The above person attributed the change in their manners to the misconduct of some Malays and Burmese, who taking advantage of the time in which the natives were on board their vessels, tied them up and carried them off as slaves. It is a fact, that several persons at different times have been brought to Rangoon as well as to Penang. How could it be expected that the natives after such treatment, would keep the least intercourse with foreigners. At present their antipathy to strangers has risen to such a degree, that it is most dangerous to approach their shores. It is said, that the Andaman people are Cannibals; but the assertion is hitherto destitute of unquestionable proof: and it would appear rather strange, that a people, who are reported to have been harmless forty or fifty years ago, could have fallen into such a state of barbarism in so short a time: be that as it may, it is certain, that peaceful persons who have called to their island, to procure a supply of water, have been murdered by the natives without provocation.

Ambergris is found in all the group of the Nicobars; and some years in such quantities, that this article is scarcely of any value in these islands. In the various islands I visited, the natives brought me ambergris for sale; but its having been mixed with the wax of a small bee, which establishes itself in the trunk of decayed trees, it was of a very inferior

quality. The genuine amber is sold very dear at Penang. The Chinese and Burmese use it for medicinal purposes.

The trepan, or bichoo-de-mar, is a leech-like animal, from fifteen to twenty inches long, to four or five inches broad. Some are of a reddish-brown, and some of a dark-brown colour. These animals lay in the sand or coral rocks, without shewing any appearance of animation. The Malays have two ways to catch them; first by spearing, and second when the water is not too deep, by diving and taking them with their hands. The Malays are, I think, the only people who prepare the trepan. They start for the Nicobar Islands in November and December, and remain there till the end of April. The way of preparing these leeches for the market, is to boil and dry them in the sun or at the fire: they are then packed up with lime, brought to Penang, and sold to the Chinamen, who are the only people, I think, fond of that *delicacy*. The price varies according to the quality; some trepans are sold at the rate of thirty dollars per pecul, some at a lower price. The Chinese alone have the skill to find out a difference between the various kinds of trepans. A Malay boat made last year, fifteen hundred dollars by merely collecting trepans.

Having been in the different islands for a short period of time only, I could not ascertain what are the different species of trees growing there, but judging by those I saw, I think they are, with a few exceptions, of the same species as those growing at Penang; the dammer tree particularly, is very common. The overseer employed by the Danes at Little Nicobar, says, that teak is found on the island, but I am inclined to believe that it is a mistake.

The soil on the sea-shore of the Nicobars is sand, coral, lime, and vegetable mould, more or less thick. The hills are red clay, as the Penang hills: the rocks are limestone, sandstone, clay and slate. As rain seldom falls in the months of December, January, February, and March, I do not know how far the plantation of spices would succeed.

When at Nicobar, I collected different species of birds which were sent to the Calcutta museum. I saw at Katchall and at Little Nicobar monkees of the species *Macacus cynomolgus*. The natives told me that several species of snakes were found in the islands, some being very venomous. The *boa constrictor* is found also in the islands, particularly at Teressa.

The shells which I collected were the following : ammonites virginea, conus generalis, cypræa, exenthama, cassidaria chiasphora, ceritheum, murx tenuispina, pteroceras scorpio, anodon dipsus, cardita caliculata.

Before concluding this notice, I beg to return my most sincere thanks to Captain R. Ashland, commanding the Danish Steamer *Ganges*, for having afforded me, with the utmost kindness, the means of visiting several of the islands above-mentioned, as also for the unceasing kindness shewed to me when on board of his vessel, both by him and his officers. I was seventeen days in the group, and I am indebted for the foregoing detailed accounts, partly to the natives themselves, but chiefly to the Reverend Mr. Lacrampe, who accompanied me to the Nicobar Islands. As this clergyman had previously resided for more than one year on these islands, and was tolerably well acquainted with the language of the natives, I have unhesitatingly relied on the information he so readily gave me.

It is as well to add, that in mentioning the harbours, their entrance, &c., I may have mistaken with regard to their exact position, but I beg the reader to bear in mind, that I am not a seaman, and therefore no one can expect from me that exactness in such matters, which can be furnished but by persons brought up to that profession, and who are supplied with the requisite instruments.

SMALL VOCABULARY OF THE NANCOWRY LANGUAGE.

Man,	Inconhay.	Chin,	Inknan.
Young man,	Maial.	Beard,	Boyalkiah.
Woman,	Ungcan.	Neck,	Kolalah.
Girl,	Uiah,	Belly,	Uhian.
Wife,	Incam.	Hand,	Kanathoi.
Head,	Koi.	Thigh,	Bhoolo.
Hair,	Inkoi.	Leg,	Anhnan.
Ear,	Nan.	Foot,	Huphala.
Nose,	Moi.	Sea,	Kahmala.
Forehead,	Lail.	Water,	Rak.
Eyes,	Olmat.	Rice,	Aroos.
Lips,	Mahnoey.	Cocoonut,	Gnhuat.
Teeth,	Kanap.	Ambergris,	Kampeï.
Tongue,	Kealatat.	Birds' nest,	Akai.

Moon,	Khaha.	Eat,	Hookgnok.
Sun,	Han.	Drink,	Phim.
Star,	Lomalay.	Go,	Ahochoo.
House,	Hnee.	Come,	Kathara.
Fire,	Hahoha.		
1. Hing.	4. Fuan.	7. Hakiat.	10. Lam.
2. Hahoo.	5. Thanin.	8. Infuan.	20. Hingian.
3. Looha.	6. Thafool.	9. Inhatta.	30. Loohagian.

Notes on the Fauna of the Nicobar Islands. By E. BLYTH, Curator of the Museum of the Asiatic Society.

The Vertebrated Fauna of the Nicobars, to judge from the collection with which Mr. Barbe has favoured the Society, and also from a nearly parallel series of specimens collected and presented to the Society by Capt. Lewis, would seem to be remarkable for the paucity of terrene species; while a large proportion of such as do occur are apparently peculiar to the locality.

MAMMALIA.

Of this class, I have examined four species only, of which three are Bats.

Macacus cynomolgus: which is also an inhabitant of the Tenasserim Provinces and Malayan peninsula, but in Arracan is represented by the allied *M. carbonarius*. I have been presented with two living specimens from the Island of Timor, which do not appear to differ from those of Malacca; the species being everywhere subject to some individual variation.

Pteropus edulis: *Pt. javanicus*, Horsf., &c. &c. Three specimens are alike remarkable for having the throat and front of the neck black, the head blackish, the nape dull reddish-brown, the back shining black, flanks and vent dull black, and the rest of the under-parts dull reddish-brown, much paler in the centre.

Cynopterus marginatus, (B. Ham.) Inhabits India generally, as also the countries eastward of the Bay of Bengal to Malacca, and the great eastern archipelago.

Hipposideros murinus, (Elliot): vide *J. A. S.* XIII, 489. Identical with specimens from Southern India, and from the Malayan peninsula.

In addition to the above, Capt. Lewis informed me of a large Monkey, evidently a *Presbytis* (vel *Semnopithecus*) from his description, of which he vainly attempted to obtain specimens, from its remarkable wildness; also of a large Squirrel, distinct from any in the Society's Museum, and therefore probably new, considering the locality.

Capt. Lewis likewise obtained, in the immediate vicinity of the Nicobars, an example of *Delphinorhynchus rostratus*, F. Cuv., as identified from its skull which he has presented to the Society, and which entirely accords with that of a specimen captured in the Red Sea.

Sus — The Nicobarian Pigs appear to have been derived from the Chinese domestic species, turned loose upon some of the islands.*

It can scarcely be doubted, however, that several additional species of mammalia remain to be discovered, as particularly Bats, with probably more Squirrels, and at least two or three species of small *Carnivora*, and perhaps *Insectivora*.

AVES.

Palæornis caniceps, nobis, ante pp. 23, 51. Capt. Lewis obtained a living specimen of this bird, with the wings and tail mutilated by its native captor. Dr. Cantor has another and very fine specimen, evidently a female, with black beak, from the Malayan peninsula.

P. erythrogenys, nobis, ante p. 23. Specimens of this bird were procured both by Mr. Barbe and by Capt. Lewis; and a living male was given by the latter gentleman to Mr. Halfhyde, of the Preventive service, who, when it died, presented it to the Society. This individual was in far more beautiful plumage than the specimens previously examined: it measured eighteen inches and a half in length, of which the middle tail-feathers were ten and a half; expanse of wings twenty-two inches and a half; and closed wing seven inches and five-eighths: irides dull greyish. The cheeks and ear-coverts, continued forward to the beak,

* It may be here remarked, that Capt. Lewis has himself turned a pair of *Cervus axis* loose, in a locality where they are likely to propagate.

are of a beautifully bright cherry-red, devoid of the lake or "peach-blossom" tinge prevailing on the same parts of *P. malaccensis*, and which, in the latter species, is continued round the nape: the crown also is not of the deep emerald-green of that of *P. malaccensis*; the occiput and nape incline to light straw-yellow; and there is a well defined black line from the nostril to the eye: all which combine with its superior size, and other minutiae that might be pointed out, as the absence of red above the ear-coverts, to distinguish it from *P. malaccensis*. Indeed, it holds much the same relationship towards that species, which *P. Alexandri* does towards *P. torquatus*; and *P. caniceps* stands in the same position towards *P. pondicerianus*; *P. schisticeps*, also, towards *P. cyanocephalus*.—*P. erythrogeus*, so far as we are yet aware, is peculiar to the Nicobar Islands, where it occurs abundantly.

Bulaca seloputo, (Horsfield): *Strix pagodarum*, Tem. Capt. Lewis informed me of a very beautiful Owl which he obtained, but the specimen was lost through the carelessness of a servant: he could not recognise the species among the fine collection of Owls in the Society's Museum, but identified it positively from a Malayan specimen belonging to Dr. Cantor. The present species has been much confounded with its Indian representative; which latter has been referred, not very satisfactorily, to *Strix sinensis*, Lath. A very large white Eagle was also shot by Capt. Lewis, but he could not succeed in penetrating the very dense jungle into which it fell: this was probably *Blagrus dimidiatus*, (Raffles.)

Todiramphus occipitalis, nobis, ante pp. 23, 51. Peculiar, so far as has been yet observed, to the Nicobars.

T. collaris, (Scopoli and Swainson): *Alcedo chlorocephala*, Gmelin. Nicobarian specimens of this bird are remarkably brilliant, with much less of the green tinge than usual upon the crown and back.

Merops philippinensis. Found also throughout India, and in the Malayan peninsula and archipelago.

Collocalia fuciphaga, (Thunberg), vide p. 22, ante.

Gracula javanensis, vide p. 31, ante. Inhabits the southern Islands only.

Sturnia erythropygia, nobis, ante p. 34. Hitherto observed only upon the Islands.

Calornis affinis, A. Hay, ante p. 36. Upon the average, this bird is less brightly glossed than *C. cantor*, of the Malayan peninsula and archi-

pelago. It was observed by Capt. Lewis in the central and southern Islands.

Nectarinia pectoralis, Horsfield : *N. eximia*, Temminck (nec Horsfield). Inhabits also the Malayan peninsula and Java, but in the Tenasserim provinces and in Arracan is represented by the allied *N. flammaxillaris*, nobis.

Zosterops palpebrosus, (Tem) : *Sylvia annulosa*, var. A. Swainson. This species inhabits the hilly parts of India, from the Himalaya to Ceylon inclusive, and also those of Arracan and Tenasserim : but I have never seen it from the Malayan peninsula, and it is represented in Java and the Philippines by *Z. flavus*, the *Dicaeum flavum*, Horsfield. The specimen described as *Z. nicobaricus*, J. A. S. XIV, 563, would seem to be merely the young ; though I have never seen an Indian specimen in corresponding plumage. The Society has, however, subsequently received Nicobarian specimens in the ordinary dress of *Z. palpebrosus*.

Oriolus macrourus, nobis, ante p. 46. A very distinct species, observed only in the central Islands. I may here remark, that since my Synopsis of this genus was written (*loc. cit.*), I have discovered that females of *O. melanocephalus* very commonly assume the plumage which is generally thought to be characteristic of the adult male ; and I greatly suspect that the same obtains in the various other species of Oriole.

Hypsipetes virescens, nobis, vide p. 51, ante. Inhabits the central Islands.

Geocichla innotata, nobis, MS. (described in the sequel to my 'Notices and Descriptions of New Birds'). Both Mr. Barbe and Capt. Lewis procured what I infer to be a female of this well marked species ; and Dr. Cantor's Malayan collection contains what I incline to regard as the male. The colouring is considerably more intense than in *G. citrina*, and there is no white upon the wing-coverts ; the presumed female only has a white throat, and the scapularies and interscapularies are olivaceous.

Dicrurus balicassius, (Lin.) A specimen of this common Malayan species was obtained at sea, by Capt. Lewis, when nearing one of the Islands.

Tchitrea — ? A species of Paradise Flycatcher, or *Shah Bulboul* of the natives of India, was observed but not obtained by Capt. Lewis.

Myiagra cærulea, (Vieillot). Common.

Treron chloroptera, nobis, XIV, 853. A very distinct species, hitherto only observed upon the southern Islands.

Carpophaga sylvatica, (Tickell). Nicobarian specimens seem invariably to differ from those obtained throughout the eastern coast of the Bay of Bengal (from Arracan to the Straits), and also from Java, Sylhet, Assam, &c., all of which are quite similar, in the green of the upper-parts being wholly unmixed with bronze, and the ash-grey of the head, neck, and under-parts having no tinge whatever of vinaceous; the primaries also are devoid of the grey tinge; and the lower tail-coverts are much less deeply tinted with dark vinaceous. Hence the *ensemble*, when several specimens of each are examined together, is conspicuously different. This species occurs in the central group of Islands.

C. myristicivora, (Scopoli): *Columba alba*, Gm.: *C. littoralis*, Tem. Both this and the preceding species are very common.

Calenas nicobarica. Found also in the Andaman and Cocos Isles, in the Mergui archipelago (according to Helfer), and in the Malayan peninsula. Two young ones procured by Capt. Lewis have the tail greenglossed black, whereas in adults the tail is pure white. The elongated nuchal hackles do not exist in the garb of juvenility.

Chalcophaps indicus. This differs from the Indian race in the deeper ash-colour of the nape, and bluer vinaceous hue of the under-parts; while the bands on the rump (so conspicuous in the Indian bird, and also in its Australian near ally, *Ch. chrysochloros*,) are very indistinct. It abounds in the central Islands.

Macropygia rufipennis, nobis, *n. s.* Most closely allied to *M. phasianella* of Australia, but rather smaller in all its proportions, and best distinguished by the uniform bright rufous hue of the entire under-surface of the wings, which occupies the whole of each feather except towards its tip. The primaries are also externally somewhat broadly margined with the same. There is really no other difference: but another species, *M. amboinensis*, of Java and the Moluccas, differs only from *M. phasianella* in its much inferior size. Specimens of all three are in the Society's Museum, and there can be no doubt of their distinctness. I have also a living specimen of *M. phasianella*, caught at sea about sixty miles from the Australian coast. It is kept in an aviary with a variety of other birds, and prefers plantain to any other food: so eager is it for this fruit, that of a morning it will alight on a bunch of plantains as the latter is carried into the aviary, and when the

plantains are hung up, it combats with the different species of Hurrials (*Treron*) and other birds, in a singular manner, to obtain undisturbed possession of the fruit. Its manner is to hover round them, and not exactly to strike with its feet, but to push with them the intruder off its perch, and this it will sometimes repeat two or three times in succession without alighting. It never descends to the ground, except to feed on fruit that may be lying there; yet, though so fond of this aliment, it was fed, when on board-ship, exclusively on maize, and in default of fruit will thrive on rice and other grain. This bird is chiefly active in the morning and evening, and scarcely moves from its perch during the day. Its coo is hoarse, deep, and subdued, a sort of croaking sound, only audible when very near, and resembling 'o-o-o-o-ah' repeated several times successively.* *M. rufipennis* was observed only in the Southern Nicobars.

Turtur suratensis, (Lath) : *Columba tigrina*, Temminck. Common to India and the Malayan peninsula and archipelago.

Megapodius nicobariensis, nobis, ante p. 52. Of this very interesting bird, Capt. Lewis obtained the egg and chick, and Mr. Barbe an adult pair, with also two eggs, which latter are noticed in my description of the species. That procured by Capt. Lewis was uniformly tinged with reddish-brown, which still further bears out Mr. Gould's description of *M. tumulus* of Northern Australia, the eggs of which he describes to vary somewhat in hue, according to the soil in which they are deposited.†

Demigretta concolor, nobis, n. s. This Demi-Egret was long ago forwarded from Arracan by Captains Phayre and Abbott, and I am assured that it also occurs in Assam. In the central Nicobars it would seem to be not uncommon. From *D. asha*, (Sykes,) it is readily distinguished by its shorter legs; the tarse measuring but three inches instead of three and three-quarters: wing eleven inches, or eleven and a half, in adults; about an inch shorter in the young: bill to forehead three inches and a half, and to gape four and a quarter: middle toe and

* This bird is since dead; its plantain diet by no means agreeing with it so well as the maize on which it was kept formerly. As for its mode of fighting, I lately saw a pair of Doves (*Turtur suratensis*) on the ground, which repeatedly flew up and attacked each other much in the same way.

† Mr. Barbe informs me that this bird is common on all the Islands; but that he never saw it perch, as Mr. Gould represents *M. tumulus* to do, in the back-ground of his plate. The pair he shot were together, upon a hillock, and upon his shooting one, the other did not make off, upon which he killed it with his second barrel.

claws two inches and three eighths, the claws short and much curved. Colour uniform dark slaty throughout; some specimens having a white line on the chin and throat. Adults have narrow lengthened plumes on the back and breast, similar to those of *Ardea cinerea*: the occipital plumes also are somewhat lengthened, as in Herons generally; but I have seen no defined occipital crest, and doubt its ever possessing one. Beak mingled dusky and dull yellowish; and the legs appear to have been olive-green.

Nycticorax griseus, (Lin.): *Ardea nycticorax*, L.

Streptilas interpres, (Lin.) Common along the coasts of the Bay of Bengal; and the Society has received a specimen from the Mauritius. One of the most universally distributed of birds.

Totanus hypoleucus, (Lin.) Excessively numerous in the Bengal Soonderbuns; and the Society has also received it from Chusan. Of very general distribution throughout Europe and Asia.

Thalasseus bengalensis, (Lesson). Nearly allied to *Sterna velox* and *St. affinis* of Ruppell (nec *St. affinis*, Horsf.), to which it would seem intermediate. *St. cristata*, Sw. (nec Stephens), is also closely allied, but remarkable for its very pale colour. From the European *Th. Boysii*, (Pen.), which it also greatly resembles, this species differs in having the bill wholly yellow, and the tail uniform grey with the back. Another allied species, which was procured by the late Dr. Helfer in the Tenasserim Provinces, agrees with the description of *Sterna poliocerca*, Gould, and is perhaps the *St. cristata* of Stephens. *Th. bengalensis* is not uncommon in the Bay of Bengal.

Sterna (?) melanauchen, Tem.: figured in Gould's 'Birds of Australia.' This species breeds abundantly in the Nicobars.

Another species common in the Bay, is the *Melanosterna anasthætus*, (Scopoli), v. *Sterna panaya*, Lath., *St. infuscata*, Licht., and *St. antarctica*, Lesson: and allied to this is a species which is perhaps *St. grisea* of Horsfield, and which was obtained by Prof. Behn, of the Danish expedition, as he was approaching the mouth of the Hoogly. If new, I am enabled by the politeness of that naturalist to subjoin the accompanying description of it.* *Anous tenuirostris*, (Tem.), is also a

* *Hydrochiledon grisea* (? Horsfield): n. s. ? *H. marginata*, nobis. Resembles *H. nigra* in winter plumage, except in being much larger, and in having the nape (surrounding the black of the occiput) pure silky white, as are also the entire under-

marine species of Tern, which I have obtained in the Bengal Soonderbuns.*

Phaëton æthereus. The only Tropic-bird, (or "Bo'sw'n-bird,") I have seen from the Bay of Bengal. *Ph. candidus* abounds near the Mauritius, and *Ph. phænicurus* towards Australia.

Pelicanus philippensis. The smaller Indian Pelican, which seems to be the predominating species throughout the Malay countries.

It thus appears, that of thirty-two ascertained species of birds, procur'd either upon, or in the immediate vicinity of the Islands, (which number includes *Bulaca seloputo*, *Dicrurus baliassius*, and *Phaëton æthereus*,) as many as eight are peculiar to the locality,—so far, of course, as has been hitherto ascertained; for it is likely that most of them inhabit also the northern part of Sumatra, and perhaps the Andamans, and the province of Mergui and its vicinity. These eight comprise several remarkable and conspicuous species, and are as follow:—*Palæornis erythrogenys*, *Todiramphus occipitalis*, *Sturnia erythropygia*, *Oriolus macrourus*, *Hypsipetes virescens*, *Treron chloroptera*, *Macropygia rufipennis*, and *Megapodius nicobariensis*.

parts, including the sides of the breast: the mantle is also much paler, and the tail more deeply forked and differently coloured. Length, to end of middle tail-feathers, ten inches and a half, or to the outermost a foot; wing nine inches and a half; middle tail-feathers two and three-quarters; bill to gape one and seven-eighths; tarse three-quarters; middle toe and claw an inch; the webs of the toes more developed than in *H. nigra*. Bill reddish-dusky, redder towards base of lower mandible; the interior of the mouth apparently coral-orange; and legs, toes, and membranes, the same, with black claws. Colour above pale ashy, with sullied whitish margins to the scapularies and wing-coverts; a defined blackish band, half an inch broad, extends along the outside of the radius, bordering the upper-part of the wing anteriorly, as in the winter dress of *H. nigra*: crown and occiput black, embracing the orbital region; towards the forehead the feathers become gradually more deeply margined with white, and the forehead and entire under-parts are pure white, extending on the nape: the great alars are silvery-ash externally, except the first, which has its outer web, and half the breadth of its inner web, with the tip, black, tinged with ashy towards the tip and on the inner web; the extent of the dark ashy tip increases successively on the other primaries, the shorter of which have a narrow white border to their inner webs; while the secondaries are tipped externally with the same: the lesser coverts of the primaries, with the winglet, are mostly dusky: middle tail-feathers pale grey, with a whitish tip; the rest white on their inner webs, and successively darker till they become blackish on the outer: underneath the wings and tail appear margined externally with blackish-grey.

* The Society's specimen of this bird is not a very good one; and I can distinguish it neither from *A. melanops* nor *A. leucocapillus*, figured in Gould's 'Birds of Australia.'

Four others exist as varieties, more or less marked, of species met with elsewhere : viz. *Todiramphus collaris*, *Collocalia fuciphaga*, *Carpophaga sylvatica*, and *Chalcophaps indicus*.

Of those which are not peculiar to the Islands, twenty-one are known to occur in the Malayan peninsula (including *Palæornis caniceps* and *Geocichla innotata*, which were discovered in the two localities about simultaneously) ; and the remaining three inhabit Arracan, and probably Tenasserim—certainly as regards *Zosterops palpebrosus*, the others being *Calornis affinis*,* and *Demigretta concolor*. It is probable, indeed, that the whole twenty-four occur in the Malayan peninsula, with also some of the remaining eight, which appear to have been hitherto observed only on the Islands.

Of the species found likewise in India, the majority are more or less aquatic, belonging chiefly to the Zoology of the Bay and its vicinity : such is *Todiramphus collaris*, which abounds in the Bengal Soonderbuns, and along the whole eastern shore of the Bay, but is very rare on the Coromandel coast of the peninsula : but *Merops philippinensis*, *Zosterops palpebrosus*, *Myiagra cærulea*, *Chalcophaps indicus* (Ind. var.), *Turtur suratensis*, and even *Carpophaga sylvatica*,† are inland species, which are pretty generally diffused—though the last is much more common in the countries eastward (as Assam, Sylhet, Arracan, and Tenasserim). *Dicrurus baliassius* I have only seen from Nepal, it being the *Buchanga annectans* of Mr. Hodgson : and the remaining species included in the *Fauna Indica* are *Nycticorax griseus*, *Strepsilas interpres*, *Totanus hypoleucos*, *Thalasseus bengalensis*, *Phaëton æthereus*, and *Pelicanus philippensis*.

Hence, the data supplied by the highly interesting Ornithology of the Nicobars, (so far as we have yet the means of judging,) connect those islands with the Malayan Zoological province, as their position on the map would indicate : at the same time that they possess several peculiar and remarkable species, not hitherto discovered on the neighbouring lands.

* I have unfortunately retained for the Museum no Tenasserim specimens of *Calornis*, not having suspected the distinctness of *C. affinis* from *C. cantor*, until Lord A. Hay called my attention to the fact. *C. cantor* is common at Penang : and I may add that Mr. Barbe has just assured me that the Tenasserim species is *C. cantor*, and not *C. affinis*.

† The very small specimen mentioned in XIV, 857, proves to have been from the Neilgherries ; but whether the race of Southern India is constantly thus diminutive, I am not yet aware.

REPTILIA.

My materials for illustrating this class are rather scanty, although it would appear that the Nicobars possess many species, more especially of *Ophidia*.

Of the *Testudinata*, Mr. Barbe mentions two, recognizable portions of both of which were brought by Capt. Lewis: viz.—

Chelonia virgata; the edible Turtle of the Bay of Bengal: and
Ch. imbricata; the “Tortoise-shell” Turtle.

Of the *Sauria*, Capt. Lewis collected four species:

Monitor salvator, (Laurent): *Tupinambis bivittatus*, Kuhl; *Varanus bivittatus*, Dumeril and Bibron, *Hist. des Reptiles*, III, 486.

M. nebulosus, Gray: *Varanus nebulosus*, Dum. and Bibr., *Hist. Rept.* III, 483.

Both of these species inhabit the Malayan peninsula, and the first occurs abundantly in Lower Bengal. According to M. M. Dumeril and Bibron, the second also was sent from Bengal by M. Belanger; but I have never succeeded in obtaining an Indian specimen.

Calotes ophiomachus, (Merrem), Dum. and Bibr., *Hist. Rept.* IV, 482. This agrees sufficiently well with the description cited, save that the terminal four-fifths of the extremely long tail are white, instead of being annulated with white. I have no Indian specimen with which to compare it. If truly identical with the Indian reptile, the analogy of other Nicobarian species that occur also in India, renders it probable that it likewise inhabits the mainland forming the eastern shore of the Bay.*

C. mystaceus, Dum. and Bibr., *Hist. Rept.* IV, 408. The authors cited found this species upon a single specimen received from Burmah. One from the Nicobars accords with their description in all respects as regards structure; but the specific name does not apply. As far as can be judged from the example before me (preserved in spirit), the brilliant colours of which are now little more than indicated, it would seem that the entire head and throat, if not also several of the anterior dorsal spines, had been bright red, or the throat and lower jaw may perhaps have

* Referring to Merrem's figure, *Hist. Nat. des Rept.* III, 361, I cannot hesitate in considering the Nicobarian species to be the same.

been orange-red ; while the body has evidently been vivid green : colours which probably depend partly on season, over and above the changeableness of hue which these reptiles exhibit at all seasons. The Nicobarian specimen is a male, in apparently the full brilliancy of its colouring indicative of the season of propagation, when no doubt it had the mishap to be secured.

Of the *Ophidia*, I can only enumerate three species.

Python (probably *P. Schneideri*). This was observed both by Mr. Barbe and Capt. Lewis ; but I have seen no specimen.

Trigonocephalus Cantori, nobis, n. s. A typical member of this genus, having 169 abdominal plates, and 214 subcaudal scutellæ. Length of one specimen thirty inches. This large one was much injured when it was killed, and appears to have shrunk considerably from drying before it was put into spirit ; from which causes it is not easy to describe its markings, but it seems to have been curiously blotched with red—which colour is not observable in a young specimen, fifteen inches and a half long. Both have a distinct lateral whitish line, bordering the abdominal scutæ and ceasing at the vent. Scales slightly imbricated. The young appears to have been dull olive-green above, mottled throughout with a double series of dusky blotches, semi-alternately disposed, with smaller spots and blotches on the sides, below which occurs the whitish lateral line : underparts greyish, from a freckling of minute dusky specks on a pale ground : on the head the markings tend more or less to be obsolete ; but a whitish band proceeds backward from below the eye, and in the young is continued upwards almost at a right angle, and there is also a whitish patch posterior to the broad angle of the jaws, but unconnected with the lateral line of the body. The adult appears to be further variegated above, by scattered white spots composed of one, two, or rarely three scales each. The young is proportionally much more slender than the adult, and the triangularity of its head is less strongly marked.

Pelamydes platurus : having a much greater portion than usual of its tail banded ; the bands diminishing to festoons anteriorly, until they are gradually lost.

The few *Reptilia* here enumerated, do not require any comment : three of them are marine species, viz. the two Turtles and the *Pelamydes* ; but the former are, I believe, more nearly connected with the Islands by depositing their eggs upon the shores of them.

PISCES.

The marine Zoology of the Nicobars being properly that of the Bay of Bengal, it would scarcely be worth while here to supply a catalogue of well known inhabitants of the Bay, even if I possessed sufficient materials for the task. The freshwater species would possess more interest in the present instance; and of those I have not seen any, either vertebrate or invertebrate, or any land *Mollusca*. Capt. Lewis, on nearing the Islands, took a flying fish, which is *Exocætus Commersoni*; and in a native hut he found a rudely prepared skin of *Balistes conspicillum*, Schn. (*B. bicolor*, Shaw); he obtained also a fresh specimen of *B. rectangulus*, Schn. (v. *medinilla*, Quoy and Gaynard, and *fasciatus* of Shaw); also a beautiful wholly green Parrot-fish, allied to *Scarus gibbus*, Ruppell, Cuv. and Val. *Hist. Poiss.* XIV, 231, upon which Mr. Swainson founds his *Chlorurus*, 'History of Fishes, &c.' II, 227 (in Lardner's Cyclopædia). Capt. Lewis brought also a few specimens, chiefly small fry, from the myriads which, (like the *Scarus* last mentioned,) resort to the coral-beds: and among these the *Dascyllus aruanus*, (L.), Cuv. and Val. V, 325, would seem to be particularly common.

Lastly, he procured three species of saltwater Eels, which I have submitted to the inspection of Dr. M'Clelland, whose valuable labours on the very difficult group of apodal fishes require no eulogy from me; and that gentleman has favoured me with the following result of his examination of them:—

"Two of them are known species, I think; namely, *Dalophis geometrica*, (Ruppell), 'Fishes of Northern Africa,' pl. XXX, fig. 3, and *Cal. Journ. Nat. Hist.* V, 213,—and *Thærodonis reticulata*, M'Clelland, *C. J. N. H.*, V, 216, and pl. VII, fig. 1. The third is, I think, a new species, of which the following will be a sufficient description.

"*Thærodonis maculata*, M'Clelland. Two rows of distinct dark spots on either side, of an oval or somewhat oblong rounded form, and placed transversely, the rows extending from the head to the caudal extremity; also a row of more elongated spots on either side of the dorsal and anal fins, parallel with the rays.—OBS. This species bears some resemblance to *Dalophis tigrina*, v. *Muraena tigrina* of Ruppell, 'Fishes of N. Africa,' pl. XXX, fig. 2; but is more robust, and the spots are without an areola as in that species, and differently placed."

INVERTEBRATA.

The only terrene species pertaining to an invertebrate class, which I have yet seen from the Nicobars, is the common *Scolopendra morsitans*. Of marine species, Capt. Lewis brought a *Loligo*, and various species of *Testacea* common in the Bay : also two species of *Asterias*, and specimens of *Fungia patella*, *Tubipora musica*, and a few other common corals. Of *Crustacea*, he preserved the claws of an extraordinarily large specimen of the common edible crab of India (*Lupa tranquebarica*), with examples of one of the species confounded under *Matuta lunaris*, and a small crab which accords perfectly with the figure and description of *Grapsillus dentatus*, Macleay, in Dr. A. Smith's 'Zoology of S. Africa;' also a *Pagurus*, and a fine specimen of *Palinurus ornatus*, and one of *Thenus orientalis*; with a small *Alpheus*, and one or two other minute *Palemonidæ* which are probably undescribed.

(To Mr. Barbe, the Society is further indebted for numerous specimens of mammalia, birds, &c. from Penang, and from the Tenasserim Province of Ye; also from the interior of the Tipperah hills. Among the Tenasserim specimens are a new Monkey (*Presbytis humeralis*, nobis), three new Squirrels (*Sciurus chrysonotus*, *Sc. melanotus* and *Sc. Barbei*, nobis,—the last being allied to *Sc. insignis*, *M'Clellandii*, and *trilineatus*),—fine specimens of *Ampeliceps coronatus* (p. 32, ante), *Treron viridifrons* (XIV, 849), and various other species of much interest, including several that had only previously been obtained further to the southward, in the Malayan peninsula and Islands.)

Notes, chiefly Geological, from Koompta on the Western Coast (S. India) by the Devamunni and Nundi Cunnama Passes, Easterly to Cumbum, and thence Southerly to Chittoor; comprising a notice of the Diamond and Lead excavations of Buswapûr. By Captain NEWBOLD.

Koompta is a sea-port on the coast of North Canara, in latitude N. $14^{\circ} 26'$, about 119 miles travelling distance, northerly from Mangalore. It stands at the mouth of a river of the same name; into which, from the shallowness of the narrow passage through the bar which blocks its embouchure, vessels of more than five corges burthen pass with difficulty. It is a depôt for the produce of Sircy, Yellopur, Hoobly, Darwar, and much of that part of the Balaghat.

Laterite here forms the surface stratum: the fundamental rocks are gneiss and hornblende schist.

The town itself contains about 400 houses, inhabited chiefly by Gou-ras and Halipaiks, Concani Brahmans, Hurkunters, Karins, Gaveets, and Mussulmans. The Haiga Brahmans live usually in *désams* scattered about the country.

The trade is chiefly in cotton, cotton cloths, rice, betelnut, dried cocoanut, cardamoms, black-pepper, sandal wood, coir-rope, salt, salt-fish, and cashew-nut.

Near this the river cuts through a bed of rich reddish alluvium, mingled with decayed vegetable matter, evidently a fluviatile deposit from the western Ghauts, and from the intervening low jungly country through which the river passes. This stratum covers an almost flat, highly cultivated plain, bounded on the north and south by long, low ranges of laterite hills, which have apparently formed the ancient banks of a great stream, which is now confined to a small space in its centre.

The cultivation is chiefly rice, sugarcane, betel, and cocoanut trees.

We landed at Oopenputtun, a salt depôt, about 4 miles from the foot of the Ghauts. Here the lateritic banks had closed in towards the river.

Laterite continues to the foot of the Devamunni pass, shaded by thick jungle.

The temperature of the water in the Oopenputtun river was 78° Fah., which was about the temperature of rain water. Temperature of air in

shade, at noon $79^{\circ} 6'$. Temperature of sea water on the coast at Koompta, $78^{\circ} 5'$.

The temperature of the soil, eighteen inches deep, was $78^{\circ} 8'$, which, according to Boussingault, would be the approximate mean temperature of the country. The temperature of most of the streams at the base of the Ghauts I found to be from 78° to 79° .

The month in which these observations were made was August.

The enormous quantity of 144 inches of water is supposed to fall in Lower Canara, from the end of May to the middle of October.

The Devamunni pass.—This pass in the western Ghauts, from Lower to Upper Canara, is about three and a half miles from bottom to top. The formation is much similar to that of the Hossalmucki pass, described in the paper 'On the Falls of Gairsuppa.' The stratification is similarly confused and contorted, and the dip irregular. At the base of the Ghaut, the strike is N. 20° E.; the dip 35° E. 20° S. Near the top of the Ghaut, the strike is N. 5° W., and dip nearly vertical, E. 5° N.

The vallies, at the bottom of the Ghaut, run W. 15° S. towards the sea, while those on the top have a SSE. direction; but the transverse vallies by which they are crossed and drained, run in a NE. direction, from the great watershed of the Ghauts to the table lands of the Balaghat, where the course of drainage is again modified by the physical contour of the country, but following generally the easterly slope of the peninsula to the Bay of Bengal, where the rivers disembogue.

The contour of the Western Ghauts at the top of this pass, as well as to the southward, is not that of an escarpment facing to the westward, and gently sloping off to the table lands of the Balaghat, as supposed by many, (a feature which is in fact confined to the more northerly portion of the ridge where the overlying trap affects their configuration,) but is a series of broken peaks, and ridges running generally in a S. by E. direction, and crossed by high transverse vallies, the descents of which are, however, shortened and most abrupt to the western coast, though rarely precipitous as at Gairsuppa. The height of these passes, on the line where the abrupt descent to the western coast commences, is rarely greater than that of the general level of the adjoining table lands from which they lead; and, in some cases, I am inclined to think, even lower.

The elevation of the top of the Manantoddy pass, determined barometrically by Mr. Babington, is $2,732\frac{1}{2}$ feet above the sea. That of the Devamunni Ghaut, taken approximately by myself, (boiling point) 2,498 feet. This observation was taken at Manjugong, which is probably a little lower than the true anticlinal line. At the falls of Gairsuppa, a little below the summit of the Hossamucki pass, a similar observation made the elevation 2,235 feet.

The extreme height of the table land of Mysore, at Bangalore, reaches (roughly) 3,000 feet; at Seringapatam 2,412 feet; Colar $2,732\frac{1}{2}$ feet; Mysore 2,695 feet; Baitmungalum 2,435 feet; Bellary 1,500 feet; Belgaum 2,500 feet; Poonah 2,500 feet. While the insulated granitic masses on these table lands frequently vie with those of the Ghauts, Sivagunga, in Mysore, is calculated at 4,600 feet, and Betrosson, at the slope of the Ghauts, 6,000 feet. These are only excelled (as far as known) by the Ghaut peaks of Bonasson, 7,000 feet, and that of Dodabetta 8,700 feet, and some others of the Neilgherry and Koonda cluster.

The passes of the eastern Ghauts, as might be expected, have a lower level than those in the western sierra. One of the highest is that of Naikenhairy, 1,907 feet. That of its neighbour, the Moogly pass, from Palamanair to Chittoor, is only $1,635\frac{1}{2}$ feet. (The foregoing measurements are taken chiefly from Dr. Babington's and General Cullen's observations.)

The height of the Heggulla has not, as far as I am aware, been ascertained: it is probably of considerable elevation, since Periapatam, which stands on the western slopes of the Ghauts, two marches east of it, has an elevation of about 4,000 feet.

Munjuguny.—Between this place and Devanary, which is usually considered the top of the pass, the Beni river is crossed, which I was assured be the natives is identical with the Oopenputtun river, below the Ghaut. If this be the case, the watershed must be east of Devanary, and probably between it and this place. The stream, swollen by the rains, was unfordable, but is crossed by a rude bridge, called a *sar*, constructed of trunks of trees bound together by leaves, and supported on piers of large rough stones piled up, and secured from being washed away by cases of strong hurdle work thrown round them. The stream was

about thirty paces broad, and running towards the south with great rapidity.

Granite is seen in this vicinity outcropping from the laterite.

The black exterior of the rocks I found to be occasioned by a thin coating of mixed vegetable and ferruginous matter.

The jungle still continues, but is lower than below the Ghauts. The cinnamon tree is abundant: the natives here class it into two species, viz. the male and the female: the former they distinguish by the greater size of its leaf, and the less aromatic and more bitter taste of the bark.

From the top of the Ghauts to Sircy.—The hypogene schists, principally gneiss and hornblende, and a coarse-grained felspathic granite, appear occasionally from beneath the laterite. The low hill, on which the ruins of the old town of Sircy are still to be traced, is covered with a thick stratum of laterite imbedding angular fragments of quartz. The laterite is here used extensively as a building stone; and the quartz is pounded into an excellent sharp sand for mortar.

The indented and more abrupt features, which distinguish the anticlinal line of the Ghauts, are here softened down into smoothly swelling hills, with round tops, in general thickly covered with wood, and vallies in which, and on the hill sides, the cultivation of cardamoms, black-pepper, and the areca nut, is carried on with great success, chiefly by the Haiga Brahmans. The areca trees are planted in rows on strips of ground five or six paces asunder, and separated by channels of running water, two or three feet deep. The pepper vine entwines its clinging tendrils around the tall stems of this graceful tree, covering it thyrsus-like, with its foliage; while the long, flag-leafed cardamom shoots out its string of aromatic seeds along the ground shaded by groves of plantains, which form a sort of underwood beneath the tall arecas. These gardens of spices growing in the midst of forests still uncleared, have a unique and very beautiful appearance. The extreme fertility of the reddish-grey vegetable mould, (in spots where the woodman's axe has not yet been felt,) shows that much still remains to be done.

Sircy is a place of considerable traffic, and a depot for the cotton and other produce of the Southern Mahratta country, ceded districts, and part of Mysore, on its way to Koompta on the western coast, whence

it is shipped for Bombay, &c. It is sent down the Ghaut on loaded bullocks; the pass not being practicable for bandies.

The present town of Sircy comprises between 5,000 and 6,000 inhabitants; principally Lingayets and Concany Brahmans. The chief bankers and merchants are of these different sects: about 800 Mussulmans, Mahrattas, and a few Jains. The custom-house and betelnut depôt are the principal public buildings. There are three distinct bazaars, with one or two broad but dirty and badly-drained streets (1839). The better class of houses are tiled, and often double-roofed.

The ruins of an old but small fort, said to have been built by the Rajas of Soonda, and of a still more ancient one, the work of the Jaina Skeri Rajas, still remain. On the rising ground in this vicinity, foundations of houses and numerous wells attest the former existence of a large and populous town. There is a temple to Virabhadra, and one to the goddess Mariama, whence a snake, patronized by the Brahmans, is said to make its appearance twice a day, probably to be fed. I had not an opportunity of testing this story; which however is by no means unlikely. I have often seen offerings of milk and plantains before the holes of the Cobra, which is held in superstitious veneration by most classes of Hindus. This is the veneration born of fear, which induced the Egyptians to worship the evil principle Typhon,—produced the Devil-worship of Ceylon,—and compelled the poor foresters of the Eastern Isles to make offerings to Thunder and Lightning. Hence the ancient ophitic worship which prevailed so extensively in Southern India, the emblems of which may still be seen piled up carved on rude stones round the walls, or under the trees which shade the older and more secluded pagodas.

From Sircy to Savanúr and Lakiswar.—The face of the country is undulating and interspersed with low, rounded hills to Savanur, in the Southern Mahratta country, about forty-four miles NE. of Sircy. The Canara boundary is crossed about thirteen and a half miles NE. from the latter place. The country is more open; the Ghauts are left behind, and the table land of the Southern Mahratta territory fairly entered on.

The intervening rocks are chiefly the softer members of the hypogene series, as seen at Darwar, viz. argillaceous slate clays, white and vari-

ously tinted with oxyde and hydrate of iron, and earthy chloritic schists. Some of these schists are highly ferruginous. Farther south they pass into the soft, talcose, and chloritic schists, west of Bangalore. Dykes of basaltic greenstone, with beds of kunker, become more frequent as Savanûr is approached. The latter mineral fills up seams in the subjacent rocks.

The breadth of this band of soft schists extends easterly to the town of Lakiswar, and from its northerly strike is evidently the prolongation southerly of similar strata at Darwar already described. The dip at Savanûr was 40° easterly.

Régur was first observed a little to the west of Bankapur; near which town the vegetation, peculiar to the Ghauts, terminates abruptly.

From Lakiswar to Gudduck, granite, gneiss, and hornblende schist are the prevalent rocks, and easterly to Bellary, in the ceded districts; but, as the geology of the country between Gudduck and Bellary, has already been noticed, I shall not dwell farther upon the subject here, but proceed at once on our easterly journey from Bellary towards Cumbum.

Bellary to Davankonda.—Gneiss is the principal rock between Bellary and Davankonda, (a distance of fifty-three miles) basing a plain sloping northerly towards the Tumbuddra, the surface of which (with a few interruptions of reddish alluvial patches) is covered with a thick bed of *Régur*.

The Hogri river is crossed about twelve miles from Bellary, at the village of Moka. It is here about 700 yards broad: its bed is now (May) a dry extent of sand, and its banks barren with the heaps, and hills of drifted sands. The prevailing westerly winds, cause the dunes to march in an easterly direction, north of Auspari. The next march from Moka, the granite is seen bursting through the gneiss in a low ridge: oxydulated iron replacing the mica in grains and nests: east of Auspari a large trap dyke is seen running ESE.

Davankonda is situated at the base of one of the granitic outbursts, on the borders of the Andhra kingdom. Telinghi is much mixed here with the Canarese, or Karnâta, of Bellary.

The soil at the base of the granite is reddish, and sandy to a certain distance round the base: at the edges of this upper layer the *régur* will be found underlying it; and below the *régur* either the gravel result-

ing from the weathering rock, or a bed of kunker. Actynolite, colouring both compact felspar and quartz in drusy crystals in pegmatitic veins of red felspar and quartz in the gneiss, is of common occurrence.

Kupputral.—Is a polegar stronghold, formerly of great notoriety in this country, which bristled with polegar fastnesses and strongholds. The granite rises here into steep bosses, cliffs, and tors, of no great height however.

On the summit of a rocky shelf, crowning the rock, and insulated by a broad fissure in the granite cliff, is perched a small watch-tower, whence there is a good prospect of the surrounding country, the features of which to the south and east are savage and rocky. The nearest approach from Bellary is by rocky ascents and descents, and by defiles not practicable for a cart. On the ascent I picked up a fragment of a very beautiful rock which may be termed actynolite porphyry, being composed of a bright green actynolite felspar (compact), imbedding red felspar crystals.

About a mile east of Kupputral the granite is overlaid by sandstone, which forms the range of Cowilhutty, supporting a flat cultivated table land. I had not an opportunity of examining these rocks at their junction line. A greenstone intersects the granite in the plain.

Codamoor.—At Codamoor, direction SE., fragments of altered sandstone abound: the next march the country is a wide plain, watered by the Hendri river, and studded with bare granitic rocks in small piles and clusters. Gneiss, basaltic greenstone in dykes, and a porphyritic granite are the prevalent rocks. A little north of the town runs one of these singular abrupt beds of compact reddish quartz rock, which evidently belongs to the hypogene series by position, interstratification, and conformable dip. It forms a short abrupt ridge, apparently about 100 feet high, and passes into a coarse jasper, penetrated with numerous veins, strangely contorted, of a whiter quartz, with iron glance in nests. It is also veined with siliceous earth, of a grey or bluish tinge, imbedding crystals of felspar, and is often porphyritic in structure.

A thin purplish-black *enduit*, which coated some of the fissures, gave evident traces of iron, and faint traces of manganese on being fused with borax before the blow-pipe.

On the western flank of this range, which runs nearly north and south, a dyke of basaltic greenstone intersects the plain; and near it, one of a

dark chloritic felspar porphyry, which is seen in a section afforded by a well about 40 feet deep, at the south extremity of the ridge. It is overlaid by a stratum of kunker ten feet thick, which has evidently been deposited by water, charged with lime, rising through fissures in the subjacent rocks, which are often encrusted with kunker.

The Hendri river is forded about a mile to the west of Codamoor. It is 220 paces broad; banks and bed of silt and sand, imbedding tufaceous concretions of carbonate of lime, which encrust the roots of grasses, &c. The shallow water in the channel of the river had a temperature of $71^{\circ} 5'$ Fah., which is a little lower than the average temperature of rain water in this part of the ceded districts. The temperature of the air in shade at the time of observation was 81° . The great evaporation going on from the wide, flat, sandy bed, may have diminished the temperature of the shallow stream which slowly trickled along its centre. At Codamoor, the temperature of a brackish well, sixteen feet deep, was 81° ; that of a sweet water well, of similar depth, 84° ; and that of a third slightly brackish, and thirty feet deep, 83° .

Kurnool.—From Codamoor to Kurnool, at the junction of the Tum-buddra and the Hendri, extends a plain covered with little interruption, by régur. In this plain the diamond limestone and sandstone formation meet with and overlie the hypogene schists; over which we have so long been travelling. The sandstone is seen in the low hills, about one and a half miles south of Perla, which lies ten and a half miles westerly from Kurnool; near this are numerous dykes of basaltic greenstone and deposits of kunker.

A little to the NE. of Peddapa, five and a half miles westerly from Kurnool, the limestone was first observed *in situ* as a slightly elevated bed, crossing the Kurnool road, running in a southerly direction, and dipping towards the east at an angle of 35° ; while the hornblende schists, on which it rested unconformably, were nearly vertical.

The limestone is of a reddish-brown colour externally, but internally of a purplish-red; structure, schistose. It effervesces feebly with acids, and fuses into a light greyish-green enamel, leaving a white calx of caustic lime. It passes into cream-coloured, dull yellow, and green varieties, which were analysed for me by my friend Dr. Macleod, Inspector General of Hospitals, and found to contain so much magnesia

as to give them the character of dolomite. It often contains translucent nodules of a siskin green nephrite. In some places, elliptic and tubular cavities are observed in the massive varieties: the more exposed of which are generally empty; while others are seen filled with a ferruginous clay or earth, which is magnetic after exposure to heat. The elliptic cavities often occur in strings.

A bed of ferruginous sandstone is seen in the limestone, a little further eastward.

The hornblende schist has evidently been greatly waterworn near its contact. Its surface, to the depth of several inches, is much weathered, and has sometimes crumbled into a dark-green sandstone, cemented by calcareous matter from the superincumbent limestone; at others it assumes the aspect of a rust-coloured siliceous schist, impregnated with calcareous matter. Many of the loose blocks of hornblende schist have been much corroded, apparently by aqueous action.

As the edges of the limestone are left behind, and as we advance soon towards the centre of its area, the disturbance and dip become less, till near Kurnool, as seen in the banks of the Hendri and Tumbuddra, the beds are nearly horizontal. Another change of dip, from the nearly horizontal to the vertical, may be seen in the space of a few yards in the limestone beds to the right after entering the western, or new gate of Kurnool fort.

The colour of the limestone at Kurnool is generally a light bluish-grey, which passes into a deep blackish-blue. Near trap dykes, it often becomes crystalline, magnesian, and cream-coloured; or speckled and variegated with green bands, like some varieties of serpentine.

It usually abounds with iron pyrites; and to the right of the western gate in the fosse of the fort, may be seen to imbed a fine layer of red jasper, often reticulated by bluish quartz, and calcedonic veins. This jasper also runs in veins, and occasionally in nodules. Near this, the limestone strata have evidently undergone plutonic disturbance, being elevated with waving and bending of the layers into a nearly vertical position as before mentioned.

From Kurnool to the Eastern Ghauts.—After having forded the Hendri to the eastward, low rugged hills, the outgoings of a great dyke of basaltic greenstone, having a westerly direction, are crossed, altering

the limestone and its associated purple shales in a singular manner. The latter are converted into a compact jaspideous rock, and the former loses its carbonaceous colouring matter, and becomes siliceous, or magnesian, or both, and is often coloured, with green bands and specks. The portions nearest to the dykes sometimes break, when struck by the hammer into fragments with smooth sides, marked with dendritic delineations.

Beyond these hills, the head of the central sandstone range of Kurnool, is rounded to the broad and almost flat valley of Nundial, based on the limestone and its shales, which are generally of a chocolate and reddish hue, with thin seams and layers of faint green. The surface soil is for the most part *régur*: on a sub-soil of limestone debris, or on beds of kunker, a poor pisiform iron clay is sometimes found, mingled in the lower portions of the *régur*.

Eastern Ghauts.—Having crossed the valley of Nundial, the eastern Ghauts are approached at Gazoopilly, a pleasant village at their western base. Their outline is apparently pretty level, continuous, but broken now and then, by a hog-backed ridge, or the rounded frustrum of a cone, rising above the general elevation of the central anticlinal range, which may be about 1,000 feet above the plain; though few of the highest peaks attain the elevation of upwards of 3,000 feet above the sea. The base, sides, and most of the summits, are clothed with jungle infested by tigers.

Lead Mines and Sulphate of Barytes.—After ascending the Nundi Cunnama pass, about three miles, and crossing the first chain of hills, we turned from the bullock-road into the jungle on our right, and ascended a steep rocky hill. The descent on the other side brought us on the Mahdeopur wood cutters' tracts, along which we proceeded 4 or 500 yards easterly, passing a small, rough, stone enclosure, formerly used for washing the diamond alluvium. We now again turned into the jungle on the right of the path, and passed up the dry channel of a brook, which ran westerly in a deep defile. After a few minutes' walk, two jungle-covered hills rose on each bank from the brook's margin. The one on our right was covered with clumps of bamboos, and rugged from top to bottom with choked up excavations. I traversed an area thus broken up, upward of half a square mile in extent. These excava-

tions are of irregular shape and size, and vary now from five to fifteen feet deep.

The formation is the shales and schists of the diamond limestone and sandstone, here of a dull greyish-blue, and green hue, argillaceous in character, and veined in all directions by white quartz and chert. These veins are the matrix of the galena and sulphate of barytes. The former new mineral occurs in nests and strings of great brilliancy and purity, but I did not observe any thing like a continuous lode. The sulphate of barytes is in large masses, nodules, and short veins, associated with a dull-green crystallized mineral, calc spar, a white mineral like calamine, iron pyrites, and a faint reddish mineral, sometimes compact, and sometimes approaching saccharine in texture; which, Mr. Piddington, after analysis, has pronounced to be that rare mineral, carbonate of cerium. The quartz composing these veins is often honey-combed, and its cavities lined with an orange-brown coloured dust, as we see in the vein stuff of European mines. The excavations are overgrown with brushwood, and apparently have long been deserted. They are about six miles east of Gazoopilly, and within a short distance of the principal coast communication of Nellore with the table lands of the ceded districts by the Nundi Cunnama pass; and the jungles yield a cheap and never-failing supply of fuel; but until the discovery of a continuous lode, it would hardly be advisable to enter deeply into any mining speculation in those plumbiferous tracts. However, there can be no doubt, that these localities have not yet been fairly tested by European practical skill and experience.

Buswapúr Diamond Mines.—The diamond pits of Buswapúr are still nearer to Gazoopilly, extending from about quarter of a mile NW. from the present village of Buswapúr, easterly towards the base of the eastern Ghauts, and covering an area of certainly two square miles. They are even more overgrown by jungle than the lead mines, and have evidently been given up at a more ancient date.

About three-quarters of a mile SE. from the modern Buswapúr, near the ruins of the old village, are about twenty other excavations overgrown with thicket, like the rest; and ten more midway between them and Gazoopilly, a little to the south of the foot-path to the pass. These excavations vary from two and three yards to fifteen yards in

length, and from one to four or five yards in breadth: their present depth (much choked up by rubbish) is from five or six feet to sixteen feet. The only stratum cut through is a thin layer of reddish alluvial soil, into a bed of gravel of unknown thickness in some parts. The pebbles composing these gravels have evidently been derived from the limestone and sandstone hills of the Ghauts, at the western base of which they immediately lie, and consist principally of cherts of various colours, quartz, compact sandstone, and a few of basanite. Layers of sand are occasionally interstratified.

Some of the pebbles are as large as a cocoanut, but the generality not larger than an orange or walnut; most of them rounded, and lying on their flat sides, having the major axis in an east and westerly direction. I cannot find that the rains of present monsoons add to some of these gravel beds, many of which are situated far from the reach of present torrents, and through which the streams often cut deep channels; but am rather inclined to believe, that some of them must have originated during the elevation of these mountains from the bed of the ocean.

Nundi Cunnama pass.—This pass lies in the direct line of commercial communication from the coast and ports of Nellore, Masulipatam and Ramapatam, with Kurnool, the ceded districts, and Southern Mahratta country. It is steep, and can only be traversed like the Hegulla pass, by bullocks lightly laden, but is susceptible of great improvement. Yet with the exception of those of Sidhout, Jungumrazpilly and Yeddedgoo, the Nundi Cunnama is the most practicable, and certainly in the most direct line. Loaded bandies are compelled to take the circuitous route of Cuddapah and the Yeddedgoo pass.

The improvement of the Nundi Cunnama into a road practicable for bandies, would much improve the trade of the districts to the west of it. In 1836, from information obtained on the spot, about 1,000 bullocks pass over from the eastern coast laden with its salt and cloths, and returning with iron for ploughs, the produce of hill furnaces, and cocoanuts, betelnuts, and teak and other timber. Remnants of wells in the forest, and a small ancient temple to the Bull Nundi, (hence its name) attest the antiquity of this channel of commerce. The formation is similar to that described around the lead mines: but the higher ridges are capped with sandstone. That singular aboriginal race, the Chen-

suara, act as a hill police. I have given an account of them elsewhere. They may be seen usually at Metta and Pacherla, two police stations in the forest.

The pass itself is not much more than two and a half miles, but the breadth of the hilly and jungly tracts from Gazoopilly to Kistnashetty-pilly, on the eastern side of the range, cannot be less than twenty-three miles.

Cumbum.—Cumbum is nineteen and a half miles to the eastward of Kistnashetty-pilly. The hills near the bund of the large and beautiful tank, are of sandstone. This fine sheet of water is about five miles long by three or four broad. It is nearly surrounded by picturesque hills, and several rocky islets stud its bosom.

From Cumbum to Budwail.—We shall now turn southerly, down the Cummum or Budwail valley, which is chiefly based on the shales of the diamond sandstones and limestone formation running southerly, and containing veins, and large beds of white quartz. Near Yelmacul a mass of porphyritic syenite is seen rising abruptly through the shales at its base. A pagoda built on its summit renders it conspicuous. The wells near its base exhibit the fissures of the shales, encrusted with carbonate of lime. This is the case also farther south, in the valley at Poormáwala, when the quartz veins frequently imbed iron pyrites. The summits of the range running down the centre of the valley from Poormáwala by Budwail to the Pennaur, I found capped with compact sandstone, in almost tabular masses, associated with arenaceous schists. The lower parts and base are composed of the shales or slates.

From Budwail to the Auripoya pass.—From Budwail, southerly to the Auripoya pass, the shales prevail, and become softer and lighter coloured. The soil is chiefly reddish, light, fertile, and generally well watered. Subsoil—a bed of kunker, nodules of which and fragments of quartz, often honey-combed, are scattered over the surface of the lower part of the valley.

Auripoya pass.—This is a rugged pass, about eight miles long, through the Sidhout ranges into the transverse valley by which the Pennaur passes, through the Ghauts to the maritime plain of Nellore. Here sandstone and arenaceous schists prevail; angular blocks of which, and fragments of a white and a grey smoky quartz, encumber

the bottom of the pass ; till, at length, it debouches on the sandy bed of the Pennaur, a little to the east of Sidhout fort.

Sidhout.—The blue limestone is said by the natives to be found under the sands of the river ; and it is seen in blocks in the walls of the fort ; but the hills, which I had an opportunity of examining, were all of sandstone, and sandstone conglomerate.

A beautifully variegated variety of sandstone is quarried near this. The Hindu pillars in the fort gateways, which are carved out of it, have the appearance of an elegantly veined wood. The tints are often waved, or acutely angled bands of different shades of brown, resembling on a large scale those in agate.

Diamonds, I was informed, during the rule of the Patan Nawabs of Cuddapah, who often made Sidhout their place of residence, were dug at Durjipilly, and, at another place among the neighbouring hills.

The Pass of Sidhout.—The pass of Sidhout is a transverse valley, as before stated, through which the Pennaur flows from the table lands of the ceded districts, through the Eastern Ghauts to the Coromandel Coast. There does not, however, appear to be any great or sudden lowering of level to the coast-land, as we find that the height of Cuddapah, 507 feet above the sea (Cullen), hardly exceeds that of the plain at the eastern base of the Ghauts. The course of the Pennaur, therefore, at Sidhout, from the little inclination of its bed to the eastward, is not more accelerated than when winding its way over the gently sloping table lands. The general direction of this transverse break in the Ghauts is easterly ; though, like that of Gundicutta, it makes considerable angles. It is about twenty-four miles long, and about two and a half miles broad at Sidhout. I have not had an opportunity of examining its eastern exit near the Someswar pagoda ; where, I understand, the river is confined between two rocky ridges, about half a mile asunder.

From Sidhout to Cuddapah.—The road lies along the valley of the Pennaur, which opens out to the westward into the horizon-bounded plains of Cuddapah. The rock seen in the lowest situations, is a bluish and rather grey crystalline limestone, bounded on either side by the high sandstone ranges of the easterly ghauts. The limestone is veined with quartz and calcspar, and imbeds cubic crystals of iron pyrites. A few

miles from Cuddapah, it crosses the valley of the Pennaur in a well defined ridge, across which the road lies by a small pass, called the Bundi Cunnama. The ridge to the south I found to be capped by sandstone. The limestone here has an external scabrous aspect, owing to the less rapid weathering of the veins of chert which run through it, and which project in relief from its surface. At the eastern foot of the pass the rock has been excavated for the sake of the dark flint-like chert it imbeds, which was formerly used for gun-flints by the armies of the Cuddapah Nuwabs, and by those of Hyder and Tippoo; but the material is too brittle to make good flints. It is veined with quartz which often forms a perfect network of cells, lined and stained with an orange-coloured ochre.

Cuddapah.—The limestone formation in the vicinity of Cuddapah and the sandstone ranges to its south, have been described in notes from Madras to Goa. The latter range I crossed to Govincherroo, in the plain on the other side, by the Bankrapett pass.

Govincherroo to Rachooty.—At Govincherroo granite is seen in low bosses and large blocks, *in situ*, at the base of the sandstone range; and is thus occasionally seen in tors and logging stones, and in the beds of nullas, in the plain to Rachooty, about thirty-four and a half miles south from Cuddapah. Near Rachooty, it often passes into pigmatite; actynolite and chlorite are seen in its veins. This granite formation evidently extends to the eastward to the bases of the sandstone ranges of Chendorghirry and Tripati, which are seen in picturesque outline, flanking the plain and bounding the view to the right.

The drainage lines of this part of the plain from Punganore, converge in a N. by E. direction, to the singular gaps of Mandasir and Cheyair, in the chain through which they find their way northerly to the bed of the Pennaur near Sidhout, which we have lately left. It might be worth while to examine the configuration of these gaps, and the sections afforded by them. Dykes of basaltic greenstone are occasionally seen in the granite.

Rachooty to Chittoor.—The road lies over a flattish valley between irregular clusters of granite rocks on either side, which occasionally approach and recede, and sometimes disappear for a while, appearing again at irregular intervals. Spurs of the rocks occasionally cross the valley or

plain; and also dykes of basaltic greenstone, which were numerous south of Peelair.

About ten miles from Peelair, and six from Damulcherry, a short and easy pass in the granitic ridge to the left, leads the traveller almost insensibly over the great line of elevation, by the village of Damulcherry, into the plains of the Carnatic. About seven miles north of Damulcherry, runs the modern boundary of Cuddapah and Arcot, precisely on the ancient position of the Andhra and Dravida regions. At Damulcherry both Tamul and Telinghi are spoken, and the latter language I found much in vogue at Chittoor.

At Peelair, gneiss and hornblende schists appear more frequently near the bases of the granite hills; and, at Damulcherry, the same rocks, with a leptinitic gneiss veined with eurite and small grained granite, are the prevailing rocks.

From Damulcherry to Chittoor the floor of the break in the Ghauts, is an undulating bed of gneiss and hornblende schists. The more abrupt and peaked elevations on the north and south of the break, appear to be of granite.

About ten or twelve miles WNW. from Chittoor the descent to the last is palpable, but easy and gradual, very unlike the abrupt and high pass of Naikanairy farther south. The country is open and free from jungle, which is confined to the ravines and sides of the lofty hills of gneiss. The latter in their bold, rounded contour, and partially wooded sides, reminded me of the Pyrenees near Rosas.

In the distance to the north of the foot of this descent, is seen the high columnar rock of Pillyconda, (Tiger's hill) a striking object on the horizon.

Chittoor.—Chittoor stands in the plain at the northern and western base of a granitic range which runs south-westerly towards the Javadic ranges, which skirt the eastern flank of the Amboor valley. The granite composing the rocks, close to the travellers' bungalow, contains large crystals of foliated hornblende, sometimes curiously interlaminated with olive-green mica. The crystals of felspar are usually white, with red and faint green crystals interspersed. The felspar is occasionally translucent, and assimilates albite in external characters.

The exterior of many of the large masses of granite, which cover the hill, abounds with little cavities, from the size of a pea to that of a wal-

nut, occasioned by the weathering and falling out of the nests of mica and hornblende just mentioned.

Actynolite, chlorite, and pale rose-coloured garnet were the other minerals observed in this granite.

The range of hills, having a north and south direction, and though a break in which the Chittoor river runs easterly to the Poni river, I found to consist of gneiss often highly contorted and penetrated by granite in large dykes. Some portions of this gneiss are granitoid, and, in hand specimens, would be set down as granite; dykes of basaltic greenstone also penetrate both granite and gneiss.

Before closing this paper I must remark, that the soil from the plain of Rachooty to Chittoor, has been generally of a reddish and sandy nature, evidently the alluvium of granitic and hypogene rocks.

The great sheets of régur end abruptly near Cuddapah, their barrier to the south in this direction appears to have been the Bankripattah hills.







