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JOURNAL
OF THE
ASIATIC SOCIETY
OF
BENGAL.

INDEXED

EDITED
BY THE SECRETARY.

VOL. X.
PART I. JANUARY TO JUNE, 1841.
NEW SERIES.

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

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JOURNAL

OF THE

ASIATIC SOCIETY.

Abstract Journal of the Routes of Lieutenants A. BROOME and A. CUNNINGHAM, to the sources of the Punjab rivers.

The object of the journey which we performed during the rainy season of 1839, was to ascertain the sources of the Punjab rivers; and at the same time to collect every kind of information that we thought might be useful and interesting regarding the countries through which we were to pass.

The plan which we laid down for ourselves was to travel in company northwards from Simla as far as Tandee on the Chundra-bhága river; and there separating the one to make a detour to the east, and return to Simla by the Spiti river; the other to pursue a westerly course over the hills to Kashmeer.

The source of the Beas river having been visited before by three different travellers; Moorcroft, Gerard, and Henderson, all of whom crossed the Sutluj at Bulaspoor, and proceeded through the state of Mundee to Sooltanpoor, the capital of Kooloo; we determined to vary our route from theirs as much as we were able; and with this view we crossed the Sutluj at Rampore on the 19th of June, by a *jhoola*, or swinging rope, from which a loop is suspended in which the passenger sits. On the 20th we crossed the mountain spur separating the Koorpua Nullah from the Sutluj by the Gai Ghatee, or Cow's Pass, 7,093 feet in height, and descended through a rich cultivation to the bank of the Koorpua Nullah, which we crossed by a *sanga*, or spar laid across the stream on the 21st., and ascending the Chenáhee Nullah we passed a water-fall of one hundred feet, and

reached the village of Suroua, situated in a lovely little valley, where we saw wheat as fine as any in England. Above the village, the valley is a level meadow about three quarters of a mile long by half a mile in breadth, surrounded on all sides by thick woods of walnut, chesnut, apricot, peach, and cherry, with acacia, mimosa, cypress, cedar, and every variety of pine : amongst which were white and red roses, jessamine, a white flowering thorn like may, and a beautiful large iris, besides wall-flowers, forget-me-not, strawberries and poleantus, with flowers of all shades of red, brown, and yellow. There were three water-falls at the head of the valley ; the lowest and least pouring down in one unbroken stream over the rock, which is naturally hollowed into a deep recess, forming a very pretty, cool, and musical bower.

On the 24th of June we reached the top of the Pass at the head of the Suroan Valley, called Chaol Ghaut, 10,170 feet high, where we halted for the night. Snow was lying in a sheltered ravine on the northern slope of the mountain, which is part of the lofty range forming the shed-water between the Sutluj and Beas rivers. Several of the peaks in this range are 18,000 feet in height, and are covered with perpetual snow. From this we descended over a clayey soil, made dangerously slippery by incessant rain, to the village of Bédath, at the junction of the two torrents which form the Teerthun river, along whose banks we proceeded for three days to Larjee, where it joins the Syneja river, and where about 100 yards lower down the united streams fall into the Beas river, just at that point where the Beas after running for a long course southward turns abruptly to the west through a narrow gorge, the channel of the three united streams not being so broad as that of any one of them. We were much surprized to find that this remarkable junction of three large streams was not esteemed holy. We rested in a large cave excavated in the variegated marble rock by Munnee Ram, a former Wuzeer of Kooloo ; who, we were told used frequently to come to this place for many days together to escape from the cares of state ; but more likely he came to bathe at the junction of the three rivers, for a more sterile and inhospitable place could not be conceived.

We then ascended the course of the Beas river, which widened
Beas river.
 after a few miles into a beautiful large valley ;
 generally about half a mile across, and wooded
 down to the water's edge, with a broad winding stream variegated

with many islands. We crossed the Gomuttee river, a considerable tributary on the left bank of the Beas, by a rickety wooden bridge, and passed over the Beas itself upon inflated buffalo skins to the fort of Bajowra, where the road from Mundee, by which Moorcroft, Gerard, and Henderson had travelled joins the road from Rampoor. On the evening of the 29th of June we reached Sooltanpoor, the capital of Kooloo, and found lodgings ready for us in the house of the former Wuzeer of Kooloo. On the following day we paid the Rajah a visit of ceremony. He was the same Ajeet Singh whom Moorcroft had seen; but when we saw him he was completely at the mercy of the Sikhs, who lorded it over him, even in his own Durbar.

The capital of Kooloo, Sooltanpoor, or as it is sometimes called Rughoo Náthpoor, from the chief temple being dedicated to Rughoo-nath, could never have been extensive, and it was then daily becoming less. It is situated at the confluence of the Serbullee, a small stream, with the Beas river. It has but two streets, but they are paved with boulder stones, as are likewise all the lanes. The houses are built of stone and wood, but we saw none of any particular neatness. Goitre was prevalent, diseases of the eye common, and extreme dirtiness universal. The annual revenue was said to be 1,20,000 Rupees, of which the Sikh Government seized 70,000.

We left Sooltanpoor on the 3rd of July; but instead of crossing the river to the left bank, as Moorcroft did, by the two bridges immediately above the town, we proceeded along the right bank. The valley opened as we advanced, and the scenery became bold and beautiful. The islands were numerous and well wooded; and the banks were alternately gentle slopes covered with grass to the water's edge, and steep alluvial spurs overhanging the river, and covered with apricots, peaches, apples, pears, figs, and grasses all growing wild; further on, were the pine-clad slopes of the mountains on each bank, the nearest green, the more distant blue; and beyond all, appeared the lofty snowy peaks at the head of the river.

On the evening of the 4th of July we halted on a low bank, close to a hot well, called Seeta Koond. The well was surrounded by a square enclosure with a few stone figures of deities placed in the corners. The temperature of the water was 104°. of Faht. the spring has probably some connection with the hot wells at Biseshta-moonh, on the opposite

bank of the river, which were visited by Moorcroft, who however does not mention their temperature. In the morning we continued our journey, and after passing through a forest of noble cedars we reached the village of Booruwa. There the scenery was very picturesque. On the left and to the front were snowy peaks; but to the right there were steep cliffs of gneiss, resembling "castellated parapets," as Moorcroft described them twenty years ago. At two miles beyond this we passed Kothee, the last village in the vale of the Beas river, and proceeded to a very pretty level spot of ground called Ralha, surrounded by high cliffs, and steep green slopes, and where the Beas was so narrow that one might have jumped across it. In the morning we made a laborious ascent of two miles by an irregular flight of steps, built about 25 or 30 years ago by a Brahmin, who had charge of the custom house opposite the village of Koshee. The road was then tolerably level for about a mile; after which it continued ascending for two miles, crossing all the ravines on hard snow beds, which even then, 7th of July, had not melted, until we reached the head of the Pass, where from beneath an enormous block of mica slate, the infant Beas had its birth at a height of 12,941 feet. On the top of this block we built a pile of stones, and in the midst erected a slab on which we inscribed our initials. The crest of the Rotung-joth, or pass, is a little higher than the mica slate block, or just 13,000 feet, from which it slopes gradually to the north for about a mile over a hard bed of snow. The heat and glare reflected from the snow were intolerable, and our faces were completely blistered. From this the view of the snowy peaks of Tartary, the land of undissolving snow, was extensive and beautiful. Three thousand feet beneath us rolled the Chundra river, which even there was a deep stream, 100 feet wide; and on all sides was dazzling snow, from the midst of which towered the gigantic mountains,

—— Whose lofty peaks to distant realms in sight,
Present a Siva's smile, a lotus white.

One of the peaks, about twenty miles higher up the river, appeared like a mighty natural obelisk against the cloudless blue sky. It is called *Indr-sar-deo-ka-thán*, or "the abode of the supreme deity, Indra."

The descent was steep and rugged for about three miles to the bank of the Chundra river, which we crossed by a suspension bridge made of

birchen twig rope, having a span of 106 feet, and a height of forty feet above the stream. We halted at Koksar, the first village in Lahul, and the highest on the bank of the Chundra, at an elevation of 10,053 feet. There was not even a bush to be seen as far as the eye could reach, although the vegetation around the village was rich and luxuriant, the whole ground being covered with strawberries, dwarf irises, hyacinths, and pinks ; there was also one primrose in blossom on the 8th of July.

From Koksar we proceeded along the right bank of the Chundra for five miles to the village of Tehling, where we saw on both sides of the river a few poor withered looking yews ; snow was lying in all the gorges and ravines ; and even in the bed of the main stream there were large masses forty and fifty feet thick on each side, which had only recently been cut through by the current and undermined. In two days we reached the village of Gooroo Guntall, twenty miles below Koksar, at the junction of the Chundra and Bhaga rivers, whose united streams form the Chundra-Bhaga, or Chenab river, the Sandabal of Ptolemy the geographer. There we halted as the birchen bridge over the Bhaga river had been swept away ; and on the following morning we ascended the left bank of the Bhaga for about four miles, and passing through the large villages of Gwajun and Kardung, we reached a wooden bridge, forty feet span and forty feet in height, by which we crossed the stream, and then descended it for four miles to Tandee, the chief village of Lahul, which is exactly opposite to Gooroo Guntall, the village from which we had started in the morning. The only trees about Tandee are yews and pollard willows. On the banks of the Bhaga however there were pines ; and we found plenty of wild gooseberries of which we made very good puddings : some of these gooseberries that we bottled with snow water remained perfectly good after a journey to Simla, where they were cooked and eaten. We saw some yellow roses too on the banks of the Bhaga, and some columbine near Tandee. The crops consist of buck-wheat, common wheat, and barley ; of which buck-wheat is by far the most common. The crops frequently fail either through the backwardness of the warm season, or through the early setting in of the long winter ; indeed for three years before our arrival at Tandee there had been no good crops of wheat or barley. The natives however attributed this failure to the displeasure of Provi-

dence on account of the conquest of the country by the Sikhs, and the expulsion of the Raja of Ludákh.

At Tandee we heard of the death of Runjeet Singh; and it was currently reported that we had been sent to take possession of the country: this indeed we might easily have done, for our party mustered about one hundred people; and the natives of Lahul are so cowardly that Moorcroft relates they on one occasion, when invaded by a small party, buried their swords and fled to the more inaccessible parts of the mountains. Here we parted company on the morning of the 15th of July; the one to ascend the Bhaga river and to return to Simla by the Spiti river; and the other to follow the Chundrabhaga and to proceed through Burmawur on the Boodhil river to Chumba, and from thence to Kashmeer.

On Lightning Conductors to Powder Magazines. By W. B. O'SHAUGHNESSY, M. D. Assistant Surgeon, Bengal Medical Service.

The paper now published by Prof. O'Shaughnessy is in continuation of his paper on Lightning Conductors, which appeared in No. 99 of this Journal. The positions contained in that former essay having been arraigned in a contemporary publication,* the Professor put forth a rejoinder to the exceptions taken against his views and statements by the writers above alluded to, and then placed his rejoinder in my hands for publication in this Journal, as a necessary sequel to his original essay. The circumstances under which the paper now published was written, give it of necessity a certain controversial tone, which I have felt myself bound to account for, while laying before my readers a paper, without which the essay on Lightning Conductors, already in their hands, would be incomplete.



To the Editor of the Calcutta Journal of Natural History, &c.

Illness and absence from Calcutta have prevented my sending an earlier notice of the article which has appeared in your last number relative to the attachment of lightning rods to Powder Magazines.

The only point in the article in question, which I feel myself called upon to notice in your pages, is the attempt of your correspondent to shew that I had falsely described the spear-head of the Britannia on

* Dr. M'Clelland's Quarterly "Journal of Natural History."

Government House, as having been partially fused by lightning, on the occasion of the building being struck on the 29th of March 1838. Your anonymous correspondent accuses me of such shameful falsehood, on grounds which I shall take up in the order he gives them.

1st. That he examined the identical piece of iron, which he states now forms the point of the spear on the Britannia, and that he could observe no evidence of fusion.

As the marks of fusion I saw and described, were not larger than the size of a grain of duck shot or a small pea, and as the iron (supposing the piece to be identical, which I shall presently shew strong reason for doubting) must have been exposed to the weather for two years and ten months, an impartial writer should rather have concluded that the marks had been effaced by the exposure, than that I had stated what was untrue.

Accordingly your correspondent asserts, *secondly*, that he obtained testimony of the individual by whom the repairs were executed; who gave negative evidence to any alteration having been made in the point.

In justice to myself, I am bound to protest against such evidence being for one moment attended to—"Anonymous" No. 1, charges me with falsehood, and adduces the testimony of "Anonymous" No. 2, to corroborate his case—and this in a simple matter of fact. *Opinions* or arguments are as strong in every respect, though expressed anonymously as when authenticated by the writer's name. But on questions of *facts*, personal testimony must ever preponderate. Why does not your correspondent come forward in his own name? His papers are highly creditable to his abilities, and his testimony would then be of value as to any fact he asserts.

But receiving the case on internal evidence alone, it might be that no alteration was made in the point during the repairs; it might be that the spear-head is the same as that struck, and nevertheless it is but the natural consequence of the corrosion of an iron point by the influence of climate, that the appearances I *saw* may have been entirely obliterated.

Thirdly. He accuses me of error in speaking of the spear-head, when I should have called it the spear-point. This is not worth rejoinder. Nothing but the mere spirit of hyper-criticism could condescend to such trifling.

Fourthly. He asserts that the lower portion of the wooden spear shews no evidence of the lightning having passed through it. Neither should it, as it never was touched.

The lightning first fell on the point, the concussion shivered the spear, and the arm of the statue; from the point it struck the copper of the dome, and thence by three divisions it entered the house, as described in the accompanying report.

Fifthly. The writer states, "there is no evidence of a direct or lateral discharge on the spikes with which the head of the figure is covered." These may or may not have been affected, there was no examination made of the spikes at the time, as I had no fancy to climbing the scaffolding for the purpose, and as far as their having been struck or not affects the question of the point, those who know the freaks and antics which lightning displays in its course, will readily admit that one metallic point may be struck close to another, without this being interfered with in the least degree.

Lastly. He dwells emphatically on the circumstance that neither Captain Fitzgerald nor his Assistant Mr. Barnes, the overseer, have in any way publicly confirmed my statement, although they are both in Calcutta, and could have been appealed to.

On this I have to observe, that the writer is (perhaps better than any other person) aware of circumstances which rendered it difficult for me to appeal to Capt. Fitzgerald or Mr. Barnes on this subject—nor did I then, nor do I now, feel the necessity of such an appeal. I described what I saw. My character for veracity must stand or fall by the correctness of my statement; had the gentleman alluded to, or his assistant publicly contradicted me, it would still be a question with every impartial man, which statement was to be believed implicitly; and most observers would probably conclude, that it was more likely that the marks of fusion I described had escaped the attention of these individuals, than that I had wilfully and falsely described that which had no existence.

I contend, too, that it can never be admitted that a writer's statements are invalidated in the least degree by the silence of any persons he refers to. The writer cannot force these persons forward in his defence, and many reasons may exist, too deep for the world to penetrate, and too powerful to allow the parties to act with perfect candour,

towards one with whom they may have been placed in disagreeable relations. I speak of course generally, and solely with reference to the hardship of being expected to force forward the testimony referred to.

Throughout his remarks, the writer attaches much more importance to the question of the spear-point being struck or fused, than it in reality deserves; but as he admits, (p. 492, last paragraph) that had it been so struck, the fact would have been "fatal to his pre-conceived opinion as to the course of the lightning on that occasion," I am warranted in adducing some further evidence in support of my statement.

On the morning after the accident, I was invited by Captain Fitzgerald to visit Government House, and offer him suggestions as to the repairs required, and the re-arrangement of the conductors. I went there in the evening and met Mr. Barnes, who shewed me the broken articles, and the course of the explosion. Captain Fitzgerald I now recollect was not present on that occasion. I wrote to Captain Fitzgerald next day, and among other suggestions I especially dwelt on the necessity of replacing the wooden spear by one of metal, connecting this with the copper of the dome, and this lastly by metallic straps, with four additional conductors to be erected adjacent to the dome. Captain Fitzgerald's report, hereunto annexed, shews that my suggestions were carried into effect. On this I have here one remark to make. If this report be correct, if my suggestions have been followed, if the metal spear has been erected, what becomes of your correspondent's assertions that the identical point has been replaced, and that he has re-examined the lower part of the original spear. If, on the other hand, the wooden spear has been replaced as it originally stood, then every impartial electrician will admit,* that the Government House of Calcutta will in all probability be again, and at no distant period, the scene of a similar casualty to that of the 29th of March, 1838. In this case it is in truth provided with a snare for every thunder-cloud that passes.

With reference to my plans, before the writer censures these he should in fairness clearly and fully state what they are. This he does not do, and for such a statement I refer to the Journal of the Asiatic Society for 1839, in which my papers are published. If the Editor

* As Captain Fitzgerald does indirectly in his report.—W. B. O'S.

of the "Calcutta Journal of Natural History," desires to be impartial. I claim from him the circulation of these papers to his subscribers, with additional notes with which I will supply him with pleasure, as *extra limites* to his Journal. All expenses of printing, postage, &c. I will cheerfully defray. His subscribers will then see that I have never opposed the attachment of conductors to Powder Magazines—that I freely admitted their value, but contended that under such peculiar circumstances, they should be erected in a greater number than Mr. Daniell recommended, and at a certain distance from the Magazine.

In conclusion, I have to acknowledge the kind exhortation of your correspondent that I should conduct this discussion with moderation, and that I should refrain from indulging in a spirit of injustice to Mr. M'Clelland and himself. All this is very amiable in gentlemen who are endeavouring to fix upon me an imputation of falsehood, and who would hide from the world, that in consequence of the Griffith and Wallich controversy, and of another public occurrence of some celebrity, I have not for some time had the happiness of being numbered among the friends of my commentators on this occasion. The remembrances of past collisions has never yet mingled honey with a critic's ink, the strongest impulse of nature would, on the contrary, urge him to dip his pen by preference in gall or acid. How far this feeling has operated on the present occasion, those who know the relative positions of the parties can readily conclude; to others I shall commit my arguments and facts, (if Dr. M'Clelland will allow me to do so) in the confidence that they will be dispassionately considered, and in the feeling that if I fail, there is no disgrace in being worsted in a controversy with an antagonist of Mr. Daniell's deserved reputation.

I am Sir, with much respect,

CALCUTTA,
1st March, 1841.

Your obedient servant,
W. B. O'SHAUGHNESSY, M. D.
Assistant Surgeon.

Report by Captain FITZGERALD on the accident by Lightning to Government House, Calcutta.

TO CAPTAIN SANDERS,

No. 563.

Secretary, Military Board.

SIR,

I have the honor to report for the information of the Military Board, that the Government House was struck by lightning during the storm which occurred early this morning. The lightning seems to have been attracted to the building by the iron at the point of the spear attached to the figure of Britannia on the top of the dome; after demolishing the spear, it pursued its course down the external copper of the dome, without apparently doing any injury, and forced its way into the ball room in three separate places. It has left its traces on the ceiling and wall of the southern division of the room, where it has injured one of the pier-glasses, and then passed out at the adjoining window. Again, on the eastern side of the central division it has pursued a similar course, injuring a pier-glass, and again passing out of the adjoining windows. On the western side of the central division it has done the most injury, for after passing through the ceiling it has broken one of the pier-glasses at its corner, then running down into the marble hall, has escaped out of one of the windows, breaking in its exit, as the others also did, several panes of glass.

2nd. I requested Dr. O'Shaughnessy to inspect the effects of the lightning, and he has expressed his surprize that so little comparative injury has been caused by it. The sharp point of iron at the end of the spear, and the studding of the shoulders of the statue with iron nails (intended to prevent birds from sitting on it) has served in the first instance to attract the lightning, and that it has never been struck before, he attributes to the protecting power of the four conductors, which, however, he considers to be twice as far from each other as they ought to be.

3rd. In repairing the statue, he recommends that the spear should be made of metal, and that it should be connected with one or more of the corner conductors by means of a continuous metallic rod. It would perhaps also be advisable, under the circumstances above men-

tioned, to affix four more conductors to the house, to render it more secure from a similar visitation.

4th. With the Board's permission, I will, in rectifying the damage, carry the improvements above suggested into effect.

I have, &c.

(Signed)

W. R. FITZGERALD,

Civil Architect.

FORT WILLIAM,

30th March, 1838.

Memorandum on the Trade between the Towns of Shikarpore and Candahar.—By Lieut. J. POSTANS, Assistant Political Agent, Shikarpore, Sindh.

As it is of importance in connection with the prospects of trade with the countries bordering on, or accessible by means of the river Indus, to ascertain what return commodities may be looked for from these quarters, their value and quality as suitable to the European market, I have availed myself of the arrival of the annual Kuffillahs at Shikarpore from Candahar, to obtain the following information on the various articles composing the investments from the latter place, shewing the return trade for English piece goods, metals, groceries, &c. transmitted from the former.

I have ascertained, from good authority, that the market at Candahar for European fabrics of the usual manufactures suitable to the habits and tastes of the people of these countries, is at present unusually brisk, and the demand far greater than the supply; moreover, that there is every reason to believe from the increase of security to the merchant, decrease of transit dues, impulse lately given to Candahar as a mart for the N. W., and the influx of population, that this demand will not be likely materially to decline. To the fabrics in demand, profits derived, and other particulars, I will refer hereafter.

The insecure state of the Bolan Pass, has this year retarded the arrival of the Caravans, and decreased their number. I shall quote the following list of articles received by one:—

No. 1.—*Turquoise Earth*—mds. 14—price from four rupees to twelve rupees per lb. This article is an important one in the trade to

Shikarpore from Candahar, but it is doubtful if it would be adapted to the European market. The mines are situated at Nishapūr near Meshid, and the Persian Government has of late years placed agents to prevent any large or valuable stones from being exported to Herat, whence they find their way to Shikarpore viâ Candahar; there is therefore a great scarcity of the large Turquoises, which are so much prized, the smaller are sufficiently plentiful to be worn by all classes.

The stone is polished from its rough state by means of a vertical wheel of baked clay, set in motion by the hand and moistened, the value of the stone being entirely determined by the depth of its colour, and absence of white flaws.

- 2.—*Raw Silk* (kokanee)— $\frac{1}{2}$ md. price rupees 9-9-0 per lb.

See memorandum already furnished on this article.

- 3.—*Churus* from Bokhara—5 mds.—price 3 annas per lb.

An intoxicating drug prepared from hemp seed (Bang), and used in these countries for the same purposes as opium elsewhere.

- 4.—*Gum* from Candahar—46 mds.—3 lbs. per rupee.

This gum appears of the same description as that which is known as “Gum Arabic,” and is in most extensive use for dyeing, &c.

- 5.—*Silk*—Manufactured fabrics from Herat of various kinds—pieces 1854: prices not fixed.

None of these would be adapted for the European Market, being entirely manufactured to suit Asiatic tastes, and principally used in the wealthier Sindee harems.

- 6.—*Dried Fruits* of various kinds, kismis—prunes, dried black grapes, walnuts, dried apricots, almonds, and dates, in great quantities:—prices not quoted, as not probably adapted for trade.

- 7.—*Tinsel Thread for embroidery*.—2 mds.—price 1 anna per tolah.

- 8.—*Khund Seah*, preparation from the sugar cane of Jellalabad— $1\frac{1}{2}$ mds.—price $1\frac{1}{2}$ lbs. per rupee.

- 9.—*Broken Copper and brass vessels*— $4\frac{1}{2}$ mds.—copper 1 rupee 8 annas per lb.—brass 1 rupee 7 annas per lb. These are returned to Shikarpore to be re-manufactured, for which they do not apparently possess the means at Candahar.

- 10.—*Rodung*. Madder dye—40 mds.—price 8 rupees per md. This is an important article in this trade, and brought down in con-

siderable quantities. There are two descriptions called "*Rodung kukree*," and "*Rodung phurreeah*." The latter is cultivated at Candahar, is of a larger size, and valued at 16 rupees per md., or double that of the other.

- 11.—*Saffron Bakooee*— $\frac{1}{2}$ md.—per lb. 15 rupees. "*Bakooee*" so called from its being produced at Bakwa, to the west of Candahar.
- 12.—*Safflower* from Herat (quantity not known) price 37 rupees per lb. about 10 boxes annually, of from 6 to 10 lbs. per box.
- 13.—*Gum Salop* from Herat (quantity not known)—5 Rs. per lb. Small quantities only of this article are brought down, but it is in great request at Shikarpore.
- 14.—*Sir Khisht*, a species of manna, price 5 Rs. per lb ; from Herat, used medicinally, and about 10 mds. imported annually.
- 15.—*Musagh*, dye from the walnut tree; Cabool—8 mds— $1\frac{1}{4}$ lb. per rupee.
- 16.—*Antimony* from Beila in Lus—mds. $15\frac{1}{2}$ —price $1\frac{3}{4}$ lb. per rupee. An article in great demand, from the constant use made of it by the natives of these countries. If adapted to the European Market, it should find its way to Bombay via Soumeany and Karrachee.
- 17.—*Old paper* $6\frac{1}{2}$ mds.—price 2 lbs. per rupee. Sent to Shikarpore to be re-manufactured.
- 18.—*Punvieer* (not known)—20 mds.—9 lbs. per rupee. Used medicinally, and produced from some wild shrub in the hills.
- 19.—*Podeneh*—dried mint—6 mds.—5 rupees per maund.
- 20.—*Hingozeh*—Assafoetida—60 mds.— $1\frac{1}{4}$ rupee per lb. This is an important article of this trade, being produced abundantly in Khorassan and the hilly country of Beloochistan.
- 21.—*Caraway seeds* from Khorassan (quantity not known)—2 lbs. per rupee—about 70 or 80 mds. imported annually.
- 22.—*Airmah*, a very fine description of cotton from Herat, about 80 mds. imported annually—price $1\frac{3}{4}$ rupee per lb.; used in embroidery, and highly prized.
- 23.—*Cochineal* from Khorassan (quantity not known)—price 9 rupees per lb. The amount of annual import may be about 8 or 10 mds., and its price is occasionally from 18 to 20

rupees per lb. ; it is used in dyeing silks, and also brought to Shikarpore from Bombay.

24.—*Bhojgund* (name not known) from Khorassan—price 14 to 15 rupees per md. ; annually about 70 maunds ; in great request, and used as a dye to silks.

25.—*Gooljileel* (name not known) from Khorassan—price 15 rupees per md. ; annually about 80 mds. ; used as a green dye to silks.

The following, though appertaining to Cutchee, are inserted here, as they are products of that *country*, and imported into the Shikarpore market :

26.—*Alum* from the hilly country of Cutchee, annually about 200 mds.—price 8 rupees per md.

27.—*Khuazul*, Colocynth, bitter apple, grows as a perfect weed all over the plains of Cutchee, and to be purchased at Shikarpore 7 or 8 per one pic.

28.—*Saltpetre* can be manufactured in Cutchee and other parts of the country in any quantity required ; value at Shikarpore 6 rupees per md.

29.—*Sulphur* produced in the Murree and Boogtie hills, where are mines which deserve attention ; about 10 or 12 mds., are brought annually to Shikarpore, where it is valued at 4 rupees per md.

30.—*Khar*, a kind of potash, produced by the incineration of the Lye, or tamarisk, and other salt shrubs ; it is in great use in scouring, dyeing, &c. and worth 1 rupee per $1\frac{1}{2}$ md. at Shikarpore, 10 or 12,000 mds. are brought in yearly.

The prices of the above articles include all duties, and few of them are exported beyond Khyrpore, or the Sindh territories. About four Caravans arrive annually, and the profit on this branch of the trade is about 10 per cent.

The trade from Shikarpore to Candahar in British manufactures consists principally of the articles hereafter enumerated, and the present profits, all expences paid, are at least 50 per cent. between the two places, notwithstanding the double rate of Camel hire, (52 rupees) consequent upon the demands of our troops. As the present state of the Candahar market, however, may not be considered a fair criterion, or average of the profits of the trade, I may mention, that these

are never less than from 15 to 20 per cent., the rate of Camel hire being 20 rupees a Camel, carrying from 6 to 7 mds.

I learn that complaints have been lately made of the great inferiority of the articles, particularly the want of stability in the colours of the chintzes (printed cottons of all kinds come under this denomination) always in great demand.

In the following list of the fabrics above alluded to, I have also given the names by which they are known in these countries, with samples of such as are not recognized :—

- 1.—“ *Uhoan Makhootie*,” red dyed Cotton Cloth.
 - 2.—Cotton White.
 - 3.—“ *Kessie*,” partly coloured.
 - 4.—“ *Chuhulwel*,” long cloth (of apparently very inferior descriptions).
 - 5.—“ *Chintz pukhtet*,” (glazed Chintz.)
 - 6.—“ ——— *Budul*,” (printed cottons.)
 - 7.—“ *Madrapat*,” bleached.
 - 8.—“ ——— unbleached.
 - 9.—“ *Abrah*,” (zebra) red and white.
 - 10.—“ ———, yellow.
 - 11.—“ ———, Chenay.
 - 12.—“ *Jamadanes*.”
 - 13.—“ *Mulmul*.”
 - 14.—“ *Juggernat Muslin*.”
 - 15.—“ *Mukhmul*,” (black velvet.)
 - 16.—“ *Patun*,” bleached, species of sheeting cloth.
 - 17.—“ ———, unbleached.
 - 18.—“ *Mahoot*” coloured (coarse broad cloth.)
 - 19.—“ *Khinkaubs*.”
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Memorandum on the city of Shikarpoor, in Upper Sindh. By Lieut. J. POSTANS, Assistant Political Agent, Upper Sindh.

Shikarpore may be considered the most important town in the Shikarpore—its country of Sindh in point of trade, population, and position. influence. It is situated in Upper Sindh, or above Sindh proper, at a distance of twenty-four miles NW. from the Indus at Sukkur, about forty miles from the edge of the desert at Rojhan, which separates Upper Sindh from Cutchee.

Shikarpore dates its origin to the year of the Hijira 1026, (A.D. 1617) Origin. is an ill built dirty town, its walls in a state of dilapidation and decay, the consequence of the total neglect and apathy of the chiefs of the country to the improvement of their possessions, further shewn in the neglect of the Sindh. A canal flows within a mile of the city towards Larkhana, providing means of irrigation to a large tract of country, and a temporary, but important water communication from the Indus, during a few months of the year.

The houses in Shikarpore are built of unburnt brick, upper roomed, Description of and some of those belonging to the wealthiest the city. Sonears are of respectable size, and convenient. The streets are narrow, confined, and dirty in the extreme; the great Bazar, which is the centre of all trade and banking transactions, for which Shikarpore is celebrated, extends for a distance of 800 yards, running immediately through the centre of the city. It is, in common with the Bazars of all towns in Sindh, protected from the oppressive heat by mats stretched from the houses on either side; this although it imparts an appearance of coolness, occasions by the stagnation of air an insufferable, close, and evidently unwholesome atmosphere, evinced in the sickly appearance of those who pass nearly the whole of their time in the shops and counting houses. This Bazar is generally thronged with people, and though there is little display of merchandize, the place has the air of bustle and importance which it merits. The walls of Shikarpore—also of unburnt brick—have been allowed to remain so totally without repairs that they no longer deserve the name of a protection to the city; they enclose a space of 3831 yards in circumference.

There are eight gates. The suburbs of Shikarpore are very extensive, and a great portion of the population calculated as belonging to the city reside outside, particularly the Mahomedans and labouring classes. With the exception of one tolerable Musjied on the southern side, Shikarpore possesses no building of importance.

By a census taken with considerable care during the preceding month, the following is a return of the inhabitants of this city, including the suburbs :—

HINDOOS.

Males, 9,494 } 18,913 souls. Houses 3,686.
Females, 9,419 }

MAHOMEDANS.

Males, 4,556, } 8,647 souls. Houses 1,806
Females, 4,091 }

In detail thus :—Hindoos divided according to professions—

Hindoos.	Grain sellers,	...	...	...	...	64
	Confectioners,	...	...	...	...	56
	Cotton sellers,	...	...	...	...	12
	Soucars,	...	..	...	...	35
	Shroffs,	...	...	...	...	66
	Cloth merchants,	...	...	...	...	65
	Goldsmiths,	...	...	...	...	94
	Dealers in Drugs,	...	...	...	...	32
	———— Metal,	...	...	...	...	17
	———— Silk,	..	...	...	...	37
	———— Enamel,	...	...	...	...	19
	———— Perfumes,	...	...	.	...	11
	Vegetable and Milk sellers,	...	...	...	...	46
	Dealers in dry fruit,	...	...	...	...	67
	Do. salt and sundries,	...	...	...	...	249
	Ivory turners,	...	...	..	...	3
Total Hindoo Shops, 923*						

* The remainder of the Hindoos are composed of Brahmins, and those who are not shopkeepers.

The Mahomedans divided according to trades, &c.—

Mahomedans. Weavers of coarse cloths,	...	...	...	1554
Dyers and washermen,	...	...	...	1248
Oil pressers,	...	...	...	50
Weavers of mats,	...	...	...	30
Tailors,	...	...	...	300
Barbers,	...	...	...	244
Shoemakers and workers in leather,	...	...	...	305
Ironmongers,	...	...	...	290
Embroiderers,	...	...	...	95
Lapidaries,	...	...	...	164
Potters,	...	...	...	103
Cotton cleaners,	...	...	...	121
Butchers,	...	...	...	89
Carpenters,	...	...	...	246
Preparers of woollen mamids,	...	...	...	33
Labourers,	...	...	...	467
Musicians and singers,	...	...	...	267
Cossids,	...	...	...	83
Syuds and Moolahs,	...	...	...	433
Cultivators,	...	...	...	2389
Gardeners,	...	...	...	47
Total,				8,647

Independent of the above, there are altogether 1001 Affghans and Pattans in the city of Shikarpore, employed as cultivators, or for Police duties by the Government; they are of the following tribes.—Populzyge—2. Pishengee (Syuds); 3. Bamkzye; 4. Moorzye; 5. Easakzye; 6. Mogal; 7. Lukoozye; 8. Dooranee; 9. Baber; 10. Oosteranee; 11. Monim; 12. Kakut; 13. Ghilzee; 14. Bureeh; 15. Burdarame; 16. ———; 17. Babee; 18. Dureanee; 19. Owan; 20. Prumee.

It will be seen from the above that the population of Shikarpore may be calculated at 29,700, say 30,000 souls, of whom 9,647, say 10,000, or one-third, are Mahomedans. In the above are also included many Hindoos, who are employed in distant countries as agents from the Soucars.

The Hindoos carry on all the trade, while the cultivation and artizanship of almost every denomination is in the hands of the Mahomedans.

The dress of the Hindoos of Shikarpore varies little from that of the same class in other parts of India, except in those who are servants of the native Governments, as deputies or collectors of revenue, and these invariably adopt the beard of Mahomed and costume of Sindh. On their habits of life and religious observances, the Hindoos of this city, as indeed throughout the whole of the Mahomedan countries westward of the Indus, indulge in a degree of laxity, totally at variance with the strict rules by which they generally profess to be regulated; they possess however an unusual degree of influence at Shikarpore, and are too valuable to the financial resources of the country not to be permitted to maintain it.

With the exception of the Moolahs and Syudhs, few of the Mahomedans of this city are either wealthy or influential.

The Affghan Zamindars who under that rule held important possessions in the vicinity, and were men of note and consideration, have been gradually stripped of their rights by the Talpur chiefs, although in many cases the same were guaranteed to them under promise held to be sacred; in consequence of this their number has considerably decreased, and those who remain are poor, and from the connections they have formed in the country have become naturalized, and are no longer entitled to be called foreigners.

The country in the immediate vicinity of Shikarpore is low, and admits freely of irrigation from the inundations of the river Indus by means of smaller Nullahs, or water courses leading from the Sindh Canal. Cultivation is extensively carried on, and the gardens of Shikarpore are rich in all the fruits peculiar to the country, though mangoes, neim, acacia, pipul, and mulberry trees attain great size. The soil is a rich alluvial, and its capabilities for production are no where better displayed than in the Mogullee district (that in which Shikarpore is situated), owing to the advantages in this respect (possessed by nearly the whole of upper Sindh) being turned to due account, still comparatively speaking only a limited portion of the land is brought under cultivation. Rice and

Juwarree form the great "Kurreef" or autumnal, and wheat the Crops. "Rubbee" or spring crop; the former are entirely dependent on the inundations, which commence to be available for purposes of cultivation about the middle of April, and continue until the middle of September. The "Rubbee" crops are raised by means of wells and bunds formed from the inundation.

The soil is so rich that no manure of any kind is used; the inundations bringing with them a certain slimy matter, Soil. which appears highly conducive to fertility, the ground is allowed to remain fallow from the reaping of one crop in October, to the sowing of another in April or May, and the same with the Rubbee lands; this rule appears to obtain all over the country.

Water is found at an average of about twenty feet from the surface, and to a depth of sixty feet the finest description of sand is alone observable; with the alluvial soil is a superstrata; a stone or rocky foundation of any description is not to be seen.

All the approaches to Shikarpore are bad, from the country being so Roads. constantly intersected with water courses, and no measures being taken to provide bridges, or repair the roads, which are cut up by carts, and the constant traffic of camels, bullocks, &c. A comparatively trifling outlay would obviate this, as also improve the

Sindh canal. Sindh canal, which, from having been allowed to choke up at its mouth, and get generally into disrepair, is only navigable from the end of April to the beginning of October, whereas it is capable of affording an important means of water communication from the Indus to Shikarpore, for at least nine months of the year.

Shikarpore being in the immediate route for the transmission of Trade and influ- merchandize to Khorassan and countries to the NW. ence of money trans- by the Pass of the Bolan, has with Dera Ghaze actions.

Khan obtained the title of one of the gates of Khorassan. Its influence is more immediately felt however in the banking transactions which by means of agents it carries on in every intermediate place beyond the Bolan Pass, from Quettah and Kelat to Bokhara and Herat; as also in all places of mercantile importance in

Duties and im- India. Vexatious transit and other duties on goods ports on trade. pursuing the Shikarpore route to Khorassan have tended to turn much of its former trade, especially in European goods

received from its port of Karachee, into the channel of communication to the NW. by the way of Soomeanee, Beila, and Kelat, the more direct, and at present by far the less expensive route. A revisal of imposts,* together with a settlement of Cutchee, and the suppression of the marauding system in that province and in the Bolan Pass, would revive the trade of Shikarpore, and induce its merchants, who do not want for energy, to purchase largely of such investments as might be cheaply transmitted by means of the river Indus; with the absence of tolls on merchandize in transit, whether by water or land, they would be sure of making a favourable market, coupled also with the protection afforded them through the deserts of Cutchee, which they could only formerly procure at an exorbitant amount of black mail to every leader of a predatory band.

Shikarpore received from Karachee Bunder, Marwar, Mooltan, Bhawulpore, Khyrpore, and Loodhiana, European Imports. piece goods, raw silk, ivory, cochineal, spices of all kinds, coarse cotton cloths, raw silk (China), kinkaubs, silks manufactured, sugar-candy, cocoanut, metals, kiramee (or groceries), drugs of sorts, indigo, opium, saffron, and dyes of sorts. From Cutchee, Khorassan, and the NW. raw silk (Toorkestan,) fruits of sorts, madder, turquoises, antimony, medicinal herbs, sulphur, alum, saffron, assafœtida, medicinal herbs and gums, cochineal, and horses.

The exports from Shikarpore are confined to the transmission of goods Exports. to Khorassan through the Bolan, and a tolerable trade with Cutchee, Bagh, Gundava, Katria, and Dadur.

They consist of indigo (the most important,) henna, metals of all kinds, country, coarse, and fine cloths, European piece goods (chintzes &c.) Mooltanee coarse cloths, silks manufactured, groceries, and spices, raw cotton, coarse sugar, opium, hemp seed, shields, embroidered horse cloths, and dry grains. The various productions of these countries and their prices in the Shikarpore market† have attracted the attention of that energetic body, the Chamber of Commerce of Bombay, and in the article of indigo alone there can be little doubt but that the

* See a list of export, import, and transit duties, based on articles of trade at Shikarpore (by the author) published in the Bombay Government Gazettee of the 28th July.

† A monthly price current of articles in the Shikarpore market is now published by authority.

produce of the Khyrpore, Bhawulpore, and the Punjab countries will form a staple return commodity for merchandize to be transmitted from the other Presidency; silk (raw), drugs, and dyes may also be enumerated as well worthy of attention. The influence of the British Government, and the protection it has already afforded to trade in these countries have had their effect at Shikarpore, evinced in the increasing revenue* and settlement there of influential traders from Loodhiana, Amritsir, Bhawulpore, and other places.

The revenue of Shikarpore derivable from trade amounted last year

Revenue from trade	to Rs.	...	...	...	...	...	...	54,736	0	0
and lands.										

Other tax and revenue for lands belonging to the

town,	...	..	...	...	...	...	...	16,645	0	0
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Making a total of	...	..	...	...	...	...	...	71,381	0	0
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divided between the Khyrpore and Hyderabad chiefs, in the proportion of $\frac{3}{7}$ ths to the former, and $\frac{4}{7}$ ths to the latter. The lands and villages forming the Shikarpore Pergunnah, amount to about six talookehs, and about sixty villages, of which four talookehs and twenty-three villages only belong to the Hyderabad government; the revenue of the whole, deducting jabgirs, may be about two lacs annually.

The government of the town is vested in two agents, or governors, Government of the town. furnished by the Hyderabad and Khyrpore Ameers, who have also the duty of the Police of the district, and collection of the revenue.

The climate of Shikarpore is sultry, and the heat excessive from the middle of March until the end of August. There are no periodical rains, though storms are generally looked for at the end of June, or middle of July. If rain falls at that time, it continues for a space of two or three days, but severe falls occur at the vernal equinoxes. The air is remarkably dry and clear. The low situation of the town, coupled with its being surrounded by stagnant pools close to the walls, and a large space of the adjacent country for a considerable period

* The soucars report that the trade has increased nearly one-third during the current year.

being completely under water, would warrant a supposition that this place was exceedingly unhealthy; yet it is not so except for a short period from the middle to the end of September, during which the inundations are drying up, and ague in a mild form is prevalent. Exposure to the sun of Sindh, whether Upper or Lower, during the hot months is invariably attended with dangerous effects, and for a certain period of the year the natives themselves avoid it as much as possible. The hot winds of Shikarpore lose much of their intensity, prevailing generally from the southward, and passing over a considerable expanse of water; they continue however during the months of April, May, and June, to blow till midnight. In the deserts N. and W. of Shikarpore, the deadly simoom is often encountered.

The winds vary generally between W. and S. the former the prevailing. The Easterly winds obtain for a short period during the autumnal, and the Westerly during the vernal equinox. The former often precedes rain. Shikarpore is exempted from a great source of annoyance experienced at Sukkur, Hyderabad, and all other places on the banks of the river, from the Delta upwards, viz. sand storms. The cold months may be said to commence in September, and last until the middle of March. Frost and ice are not unusual, and vegetation assumes all the appearance of winter in a northern climate. After a fair experience of a year's residence at Shikarpore, (the season of 1839 being considered an unhealthy one,) I conceive that with the precautions considered necessary elsewhere, of good houses and due attention to draining, troops might be cantoned at this place without any greater disadvantages than are to be met with in most of our stations in the interior of India. When it is considered that the officers and men of a force stationed here during the most trying months of last year were for nearly the whole period under canvas, or in mud huts, that afforded even less shelter than a tent, and that the inundations were allowed to reach in all directions within 200 yards of the camp, it is only surprising that the disease and mortality were so inconsiderable. I believe that out of a force of nearly 2000 men, the latter amounted to under twelve cases. The mornings at Shikarpore are invariably cold.

Routes from Shikarpore to various places with which it carries on

Routes. trade, with the estimated distances.

From Shikarpore to the North and East

To Mooltan, by way of Dehi Ahmil, on the river across the river to

- Azreepore.
- „ Mierpore.
- „ Subzulkote.
- „ Khanepore.
- „ Ooch.
- „ Gullen Garrat, opening of the Ghaut or
Sutledge.
- „ Sooyabad.
- „ Mooltan.

Estimated distances 215 koss ; 23 stages for laden camels ; occupies from 23 to 26 days.

From Mooltan to Lahore, by way of Chichawntnee, across the Bendee Sheikh Morsa.

- „ Seyud Walloo.
- „ Jambia.
- „ Munjee Baba Narmac Shah.
- „ Surakpore.
- „ Lahore.

Estimated distance from Mooltan to Lahore 140 koss ; 15 stages, and occupies with laden camels about 18 days.

To Amristee from Lahore 25 koss ; or 2 stages.

From Amristee to Loodihana 40 koss ; or 4 stages.

From Shikarpore to Dera-Ghazee-Khan the route is by way of Rogan Mittenkote and Dajil, estimated distance 170 koss ; 20 stages, occupies 20 to 23 days.

Shikarpore to Jaysulmere by way of Sukkur and Roree.

- Oodenkote (Oodun ka kila.)
- Dandiolk.
- Gottaroo.
- Chomdred.
- Jaysulmere.

* If these distances are compared with those laid down in the late maps of these countries, it would appear that the koss was calculated at about one and half mile ; but the idea of distances by the natives is generally very vague, and they calculate more on the time occupied in a journey.

Estimated distance 100 koss; 15 stages, and occupies from 15 to 18 days. From Jaysulmere to Palee by way of Porwin and Jodhpore 120 koss; 16 stages, and occupies 16 to 19 days.

Shikarpore to the NW. to Dadur.

Janeedera.

Royhan (edge of the desert.)

Brushoree (across the desert.)

Kassimka Joke.

Bagh.

Meyassir.

Dadur.

90 koss; 14 stages, occupying from 7 to 10 days.

The routes above the Bolan Pass to Kelat, Kandahar, Cabool, &c. Above the Bolan. are now too well known to require repetition.

From Shikarpore to the south to Karachee by way of Sehewan,

Shikarpore to Karachee, Lorkhana, distance 150 koss; 29 stages, Karachee.
occupying from 29 to 33 days; this road is imprac-

ticable from April or May to September as far as Sehewan, and the river is the means of conveying merchandize.

*Classical terminology of Natural History. By B. H. HODGSON, Esq.,
Resident at the Court of Nepal.*

(To the Editor of the Bengal Asiatic Journal.)

SIR,

Although I think the prevalent humour of the day, which cannot tolerate any other than Greek and Roman names of genera in Zoology, is, in good part, absurd and pedantic, yet as I am told that continued non-compliance therewith on my part will be considered by most persons as a sort of excuse for past and future appropriations of my discoveries in this branch of science, as described in your Journal, I have now the pleasure to transmit to you a series of classical substitutes for my previous local designations. Many other new forms having originally received from me classical appellations (for I am no exclusionist) need not be here noticed: of those that were priorily described by local names the following enumeration supplies, on the left hand, the new

classical substitute, and, on the right, opposite thereto, the old vernacular term. A few explanations as well as dates are incorporated with the enumeration.

NEPAL,
February, 1841.

I am, Sir,
Yours faithfully,
B. H. HODGSON.

1. *Muscicapidæ Eurglaininæ*,

Simus (σιμος) *Raya*

May 1836. *Psarisoma*, Sw. *Crossodera*, Gould, in May and August 1837 respectively.

2. *Meliphagidæ*.

Alcopus (αλκη et πους) *Sibia*

See Jour. As. Society, January 1839.

3. *Falconinæ*,

Hyptiopus (υπτιος et πους) *Baza*

Journal December 1836, et May 1837.

4. *Buccoinæ*,

Comeris (κομη et ρις) *Sasia*

General structure of *Picumnus*, but three-toed, Analogue of *Apternus* et *Chrysonotus* in *Picianæ*.

5. *Sturnidæ Jeterinæ* ? *Ampelidæ Leiotrichanæ* ?

Heterornis (ετερος et ορνις) *Cutia*

Nearly allied to *Aplonis*, a subsequent genus of Gould ; Journal December 1836, and February 1837.

6. *Charadriadæ*.

Pseudops (πсевδος et ωψ) *Carvanaca*

Has the Plover head (and structure generally) with a cultirostral bill.

Journal, December 1836.

7. *Mustelinæ ad finem*.

Mesobema (μεσος et βημα) *Urvæ*

Closely allied to *Helictis*, which however has Molars $\frac{5}{6}$, and is, in fact, a *Gulo*.

8-10. *Strigidae*, Aberrant group,*Etoglaux* (αερος et γλανξ) *Huhúa*.

——Subtypical group.

Mesomorpha (μεσος et μορφη) *Urrua**Meseidus* (μεσος et ειδος) *Bulaca*

Both from their strictly mediate structure between the most typical and most untypical forms. Transac. 1836, Journal, May 1837.

11. *Coccothraustinae*,*Dermophrys* (δερμα et σφρνος) *Muniae*.12-13. *Columbidae Vinaginae*,*Rinopus* (ρις et πονς) — *Ducula*.

Diagnosis being derived from combination of bill and feet belonging to *different* types.

Ditto, Ditto,

Romeris (ρομη et ρις) *Toria*.14. *Sylviade*? *Certhiade*? *Melighagide*?*Polyodon* (πολυς et οδων) *Yuhina*

A strange form. *Andropadus* its analogue among *Brachypods*, whilst it types the Honey-suckers among its own *Sylvians*.

Crateropodinae.*Decurus* (δεκα et ουρη) *Suya*.15. *Saxicolinae*.*Polypeira* (πολυς et πειρα) *Dahila*.

Trans. As. Soc. 1836. This form since styled *Grillioora* by Sw., and *Macrourus* by Gould.

16. *Merulidae Crateropodinae*.*Anura* (αλφα privativa et ουρη) *Tesia*

Since called *Micrura* by Gould. Journal Asiatic Society, February 1837.

17. *Ampelinae*,*Prosorinia* (προσω et ρις) *Cochoa*.

A typical ampeline form, though crested and not American, stands between *Ampelis* and *Casmarhynchus*.

18. *Meropidæ*,*Napophila* (ναπος et φυλος) *Bucia*

This, or a very like form, since called *Nyctiornis* by Swainson ;
 mine the prior appellation. Journal, June 1836. My bird is, in
 no way or degree, a night brid.

19-20. *Saxicolinæ* ?*Chaitaris* (χαιτη et ρις) *Miltava**Dimorpha* (δι et μορφη) *Siphia*

India Review, March 1837.

21. *Parianæ*,*Temnoris* (τεννω seco et ρις) *Suthora*

The tiny stout bill is trincated and square at tip.

22-25. *Leiotrichanæ* ?*Proparus* (quasi *Parus*) *Minla*.*Philacalyx* (φιτος et καλνξ) *Mesia*.*Calipyga* (καλος et πυγη) *Bahila*.

Nearly allied to *Leiathrix* proper.

Hemiparus ($\frac{1}{2}$ Tit) *Siva*.

Indian Review, April and May 1837.

26. *Edokianæ*.*Creurgus* (κρεουργος) *Tenthaca*.

Nearly allied to *Tephrodornis* and *Nyctalus*, the last of which
 genera is of more recent date than ours.

27-29. *Cometes* (κομητης) *Chibia*.*Melisseus* (Bee-taker) *Bhringa*.*Dicrurus* (Auct) *Bhuchanga*.

Indian Review November 1836, and January 1837.

30. *Buccoidæ* *potius Yunxina*,*Piculus* (diminutive of *Picus*) *Vivia*

Journal, February 1837, nearly allied to *Asthenurus*.

Supplementary Note to the Memoir on the Hodésium, vol. ix. pp. 694 and 783. By Lieutenant TICKELL, Political Assistant, Singbhoom.

Through the kindness of Major Wilkinson, Resident at Burra Nagpoor, I am enabled to correct a mis-statement I made in my Memoir on the Ho Dèsum, in which speaking of the "Surrawuks" I described them as Bengallee Brahmins. They are, it appears, not Brahmins, but Jains, or worshippers of *Purusna'h*; and are still scattered over several parts of India. In former times there were many of them at a place called Aring in Chutteesgurrh, and some of their temples are there extant to this day.

Major Wilkinson describes the existence in Burra Nagpoor of the remains of a large city in the midst of the jungles on the banks of the Mahanuddee, the name of which was Seirpoor.* It flourished in the time of a race of Rajahs of the "Ho Ho Bunsee" tribe. These were Rajpoots, but the similarity of their name to that of the Koles of the present day ("Ho") is curious.

At Aring, Rajoo, and Dhunteree, Major Wilkinson fell in with several inscriptions on stone, in a character unknown to any persons in that quarter; and I trust he will be enabled to fulfil his present intention of sending some of these inscriptions to the Museum of the Asiatic Society; where there is a probability of their being decyphered, if facsimiles of them be published in this Journal.

NOTE.—I hope to be favoured with the note of a tour recently made by Major Ouseley through his Agency, in which mention is made of the extensive ruins above alluded to, and an interesting statistical account given of a region very little known.



* If I read it aright in his letter.

Proceedings of the Asiatic Society.

(Wednesday Evening, 7th April, 1841.)

The Hon'ble H. T. PRINSEP, Esq., in the Chair.

The following gentlemen proposed at the Meeting of the 5th March last, were balloted for, and duly elected : viz.—

F. BEAUFORT, Esq. C. S.

W. B. JACKSON, Esq. C. S.

W. MASTERS, Esq, Head Teacher, La Martiniere.

The necessary communication of their election, and rules of the Society for guidance, were ordered to be forwarded to the parties.

Library and Museum.

Cautley's Report on the Central Doab Canal, Allahabad Mission Press, 1840 (2 copies),	2
Lardner's Cabinet Cyclopædia—Biography: Lives of the British Admirals, vol. 5th	1
History of the Mohammedan dynasties in Spain, by P. de Gayangos, London, 1840, vol. 1st	1
Sleeman's Report on the Depredations committed by the Thug Gangs of Upper and Central India, from 1836 to 1841, Calcutta, 1840,	1
Madras Journal of Literature and Science, No. 28, July—September, 1840, ..	1
Edinburgh New Philosophical Journal, by Professor Jameson, No. 58, October 1840,	1
London and Edinburgh Philosophical Magazine and Journal of Science, 3rd series, No. 3, November 1840,	1
Yarrell's History of British Birds, pt. 21st, London 1840,	1
Calcutta Monthly Journal and Repository of Intelligence for February 1841, ..	1
Annals and Magazine of Natural History, No. 36, November 1840,	1
Oriental Christian Spectator, February 1841, vol. ii. No. 2, Bombay, ..	1
Lectures on the Religious Practices and Opinions of the Hindus, by H. H. Wilson, Oxford 1840,	1
Proceedings of the Geological Society of London, vol. iii. Nos. 69, 70, 71, for 1840,	1
Bulletin de la Société de Géographie, 2nd Série, Tome 13th, Paris 1840, ..	1
Géographie D'Aboulfeda, Texte Arabe, 2nd Liv. Paris 1840,	2
Nieurve Proeve omal de Arabische, Letters en verdere schrijftsee door Het Gewoon Europeesche Karakter onderscheidenlijk uit te drukken, Voor- gesteld door, H. E. Weijers Ze Leyden 1840,	1

The following report was submitted by the Officiating Curator for the month of March last :—

'H. W. TORRENS, Esq.,

Secretary Asiatic Society.

'SIR,

'I have to report for the month of March as follows :—

'*Geological, Palæontological, and Mineralogical Departments.*—We continue to catalogue and arrange here, at all spare times.

"The Analytical Index to papers on these subjects in the volumes of the *Researches, Gleanings of Science, and Journal* up to December 1840 is completed, and in the hands of the printers. By means of it, future Curators and students can refer backwards and forwards to papers or collections with great facility.

'In the Museum of Economic Geology, the collections in Class II (Iron); Class III (Tin); and Class IV (Copper); are arranged. I annex to this a draft of the plan upon which this part of the Museum should, I think, be arranged; and it will be seen at a glance that this system while it affords every convenience as to distinctness of classification, allows of additions to any extent, without disturbing that which is already done, and of every facility of reference for the student, visitors, and Curator, which are the main requisites in a Museum. The Catalogue to Class III (Tin) is circulated herewith, and I shall be glad to have the opinions and suggestions of Members upon this subject. Class I (Coal) and the other classes are not yet arranged for want of cases.

'*Mammalogical, Ornithological, Osteological, and Herpetological.*—Nothing new to report beyond the additions noticed below.

'Additions to the Museum have been as follows :—

'DR. SPRY.		{	Seven bottles Snakes and Lizards.
			Five ditto water, from various parts of the Bay of Bengal.
			An owl, <i>Strix</i> ——? Skeleton prepared for the Museum.

'MR. F. M. BOUCHEZ.—A Monkey, *Simnopithecus Entellus*?—Stuffed.

'LIEUT. TICKELL.—Thirty-five Birds' skins.

'I am Sir,

'Your obedient servant,

'Museum, 31st March, 1841.

'H. PIDDINGTON,

'*Officiating Curator, As. Soc. Museum.*'

Plan of proposed Arrangement for the Museum of Economic Geology.

Class.	Division. in Catalogue.	Marks.	Nos.
I. Coal and Anthracites.	A. English	C.	1 to
	B. Indian and Asiatic	I. C.	1 to
	C. Foreign European	E. C.	1 to
	D. American	A. C.	1 to
II. Iron ores, Smelting, &c.	A. English	I.	1 to
	B. Indian and Asiatic	I. I.	1 to
	C. Foreign European	E. I.	1 to
	D. American	A. I.	1 to

III.	A. English	T.	1 to
Tinores, Flags, Smelting	B. Indian and Asiatic	I. T.	
&c.	C. Foreign European	E. T.	
	D. American	A. T.	

and so on, of as many classes as may be required, the marks and numbers being always, where possible, *painted* on the specimens, and the Catalogues printed or lithographed.

H. P.

Mr. JAMES DODD, Assay Master of the Agra Bullion Department, having accepted the offer of Rs. 600 for his collection of Minerals, the following correspondence with Mr. Secretary BUSHBY took place:—

‘ To G. A. BUSHBY, Esq.

‘ *Secretary to Government, General Department.*

‘ SIR—With reference to my letters of dates quoted in the margin, I have the honor, by direction of the Asiatic Society, to state, that Mr. DODD, Assay Master of the Agra Bullion Department, has a valuable collection of minerals, which it is considered highly deserving of purchase, to be placed in the Society’s Rooms for general reference. The collection in question can be had for Rs. 600, and I am requested to submit the solicitation of the Asiatic Society to be authorized to make the purchase, the means being placed at the disposal of the Society, by a grant to that extent by the Government.

ASIATIC SOCIETY’S ROOMS,

‘ I have &c.

‘ 15th March 1841.

‘ H. TORRENS, Sec. Asiatic Soc.

‘ To H. TORRENS, Esq.,

‘ *Secretary to the Asiatic Society.*

‘ *Genl. Dept.*

‘ SIR—I am directed to acknowledge the receipt of your letter dated the 15th instant, and in reply to inform you, that before the Right Honorable the Governor General in Council can decide upon sanctioning the purchase of Mr. DODD’s collection of minerals, it would be satisfactory to His Lordship in Council to receive some general description of the collection in question.

‘ COUNCIL CHAMBER,

‘ I am, Sir,

‘ 24th March, 1841.

‘ Your obedient servant,

‘ G. A. BUSHBY,

‘ *Secretary to the Government of India.*’

Ordered—That the Officiating Curator be requested to furnish the general description required, for submission to Government.

Read a letter from Mr. Secretary BUSHBY, of 10th February last, communicating that the Government consider the authority under which the payment of Rs. 300

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per mensem is made to the Society for a Curator and the preparation of Specimens, as a sanction and modification of the allowance previously made to it, and not as an independent or additional assignment.

The Secretary brought to notice, for the opinion of the Meeting, the proposal made to him for the support of the Asiatic Society of Bengal for enabling Mons. CALLERY of Macao, to print a Chinese Dictionary, French and English, now compiling by him.

The meeting were of opinion, that as three Dictionaries in the Chinese language were already in the Library of the Society's Museum, it was not expedient to encourage the patronage solicited, but that a few copies of the work after completion might be purchased for the Library and presentation to the learned Societies in Europe, and that a recommendation at the same time should be submitted to the Government for the purchase by them of, say 25 or 30 copies for transmission to the Honorable the Court of Directors for their Library. It was accordingly Resolved—That a communication to the foregoing effect be made to Mons. CALLERY, through Mr. HURRY.

The Secretary also submitted a proposal for printing WILFORD's Manuscript on the Ancient Geography of India to complete the 22d vol. of the Transactions of the Society, which proposal was negatived, on the consideration that though the paper contained much matter to be of interest to the general reader, yet in the opinion of the Society, the time had gone by for its publication; productions of recent date from other authors on the same subject, containing more correct and valuable information, having superceded the object for which WILFORD wrote, but that the Secretary was at liberty to use the Manuscript as Editor of the Asiatic Journal, by printing extracts of such portions of it as he considered desirable and useful for his object.

Read letter from Mr. Secretary BUSHBY, of 30th December 1840, and enclosures.

' To H. TORRENS, Esq.

' No. 995.

' *Secretary to the Asiatic Society.*

' *General Department.*

' SIR—I am directed by the Right Honorable the Governor General in Council to transmit to you the accompanying copy of letter, No. 17 of 1840, from the Honorable the Court of Directors in the Public Department, dated the 16th September, and to request that the Society will enable the Government to carry into effect the wishes of the Honorable Court in respect to all Zoological and Entomological collections deposited in their Museum on the part of Government, or by persons conducting Missions on the part of the Government, and will assist the Government in giving effect to the commands of the Honorable Court in respect to future supplies to their Museum, as also in regard to the immediate dispatch of Dr. HELFER's and Captain PEMBERTON's Collections in Tenasserim and Bootan.

' I am also directed to transmit a copy of the list of the present contents of the Honorable Court's Museum as far as regards the Mammalia and Birds, that the Society may see the descriptions most desiderated.

'I am at the same time directed to request that the Asiatic Society will furnish this Department with a copy of Dr. HELPER's original list of his Ornithological collections, forwarded to the Secretary to the Society from the Political Department, with Mr. Secretary PRINSEP's letter, dated the 24th October 1839.

'I am, Sir,

'COUNCIL CHAMBER,

'30th December 1840.

'Your obedient servant,

'G. A. BUSHBY,

'Secretary to Government of India.

'No. 17 of 1840.

'OUR GOVERNOR GENERAL OF INDIA IN COUNCIL.

Public Dept.

'1st. The first of these letters refers to an application made by MAJOR HAY, through the Asiatic Society of Bengal to you, to purchase a large collection of subjects of Natural History, formed chiefly in southern Africa, and of which you have justly remarked that it would be better adapted to the Museum of Europe than of India, we accordingly approve of your having declined the purchase.

Reply to Paras. 48 and 49 of letter from the Government of India, dated 21st August 1839, No. 25 and
To letter from the Secretary to the Government of India, dated 19th January 1839, No. 2.

2nd. In your letter of the 19th January 1839, you inform us that the collections made by Dr. HELPER in the Tenasserim Provinces have been shipped on the "Madagascar;" a reference to the correspondence accompanying shews that this is not exactly correct. The collections of Dr. HELPER and of Mr. Assistant Surgeon GRIFFITHS, which have been received by the "Madagascar," are exclusively Botanical, and the other collections were deposited with the Asiatic Society.

'3rd. We take this opportunity of expressing to you more fully our wishes on the subject of collections of Natural History made in India, on account of, or under the patronage, of the Government.

'4th. In our letter of the 18th September 1839, No. 17, Paras. 81 to 87, we replied to the applications which you made in August 1837, and in September 1838, on behalf of the Asiatic Society of Bengal; and we signified our consent to the monthly payment of 200 or 250 rupees to a qualified person to superintend the Museum, with an allowance of 50 rupees a month for the cost of preparing and preserving specimens besides the former allowance for the publication of Oriental works.

'5th. We now call your attention to several points respecting the relation in which the Asiatic Society is placed towards the Company's Museum in England in consideration of this grant. It appears from the public correspondence, as well as from the Journal of the Asiatic Society of Bengal, that the collections made by several Deputations and Missions on behalf of Government, which previous to the date of our despatch above mentioned (18th September 1839) were provisionally confided to the care of the Asiatic Society, have been detained in its custody nearly two years, during which period no Zoological collections have been received in our Museum from Bengal.

'6th. We refer here especially to the public letter of Dr. J. W. HELPER to Mr. Secretary PRINSEP, dated Calcutta 16th October 1838, and to a letter from Mr. Secretary PRINSEP, dated Fort William, 24th October 1838, to the Secretary of the Asiatic Society, and to the proceedings of the Asiatic Society of the 5th September, 10th October, and 14th November 1838, published in the Journal of the said Society, also respecting collections made during Captain PEMBERTON's Mission to Bootan, &c. Proceedings of the Asiatic Society of 7th February 1838, Journal p. 90 to 168, 5th September 1838, p. 749.

'7th. It is quite apparent that the detention of subjects of Natural History, in the state in which they are usually brought from Missions or Deputations, the movements of which are necessarily expeditious, must in the climate of India be highly injurious to them, and may in many cases occasion their entire destruction; we notice this particularly with reference to the collections made by Dr. HELPER in Tenasserim, and by Captain PEMBERTON during his Mission to Bootan, since both these are new localities from which no specimens are as yet contained in our Museum.

'8th. In order therefore to guard in future against similar detentions, and to secure an early dispatch of any collections made on behalf of Government to our Museum, we should wish you to require every naturalist or officer who may accompany any Mission or Deputation on behalf of Government, to make at least a provisional report on the nature and extent of his collections immediately on the return of the Mission, to be forwarded to us without delay; further, that whenever practicable, the same officer who accompanied a Mission be instructed on the arrival of his collections to select from his labors the most full and complete series for despatch to England for the Company's Museum by the earliest opportunity, and also to superintend in person the packing and despatch, in order to secure as far as possible the safety of the same during the voyage. In cases in which the collections may have been forwarded to the Presidency before the return of the naturalist by whom they have been made, and when any length of time may be expected to intervene before he can make a selection himself, we are of opinion that it may be expected of the Asiatic Society to make such a selection as is above intimated, and to prepare the same for despatch to England.

'9th. While these instructions apply chiefly to such collections as may be made in future on account of Government, we are likewise desirous that the necessary steps may be taken towards the immediate dispatch to our Museum of a series of the Mammalia and Birds collected by Dr. HELPER in Tenasserim, as far as his collections may have been preserved from the destructive effects of the climate, and of such subjects as may be new to science we desire the supply of several individuals; at the same time we direct that the entire of Dr. HELPER's Entomological collection may be forwarded to us, since from the locality which he visited, many valuable and interesting subjects may be expected in this department particularly; and since no copy of Dr. HELPER's list of his Ornithological collections, which according to a letter from Mr. Secretary PRINSEP, dated Fort William 24th October 1838, was forwarded to the Secretary of the Asiatic Society, has been found in our records, we direct that this list be transmitted to us with all possible expedition. The directions which we have now given respecting Dr. HELPER's collections in Tenasserim, apply also to such collections in Zoology as may have been made during Captain PEMBERTON's Mission on account of Government to Bootan.

' 10. In connexion with these specific instructions, we deem it expedient to add a few general explanatory remarks, the object of which is to secure to our Museum in England, with every proper degree of economy respecting freight and packing expenses, the most valuable and interesting results of scientific Deputations and Missions on behalf of Government; we therefore repeat the recommendation, that on the return of any Mission to Calcutta the naturalist who may have made any collection, or a proper person to be appointed by you, be employed to prepare a single specimen, well preserved, of the more common Mammalia and Birds, such as are well known and described; of those that are rare, and especially of the newly discovered ones, several individuals. To afford the naturalist some assistance in this selection, we will supply a simple list of the present contents of our Museum as far as regards the Mammalia and Birds. By the plan thus recommended we shall become acquainted with the zoological productions of regions newly visited, and thus obtain materials for "Local Faunas," of which several instructive series already exist in our Museum. Of all Entomological collections we require that the entire result of any Deputation on behalf of Government be forwarded to our Museum, since these cannot be preserved in India under the disadvantages of imperfect cabinets, moisture, and general destructive effects of the climate; and being comprised in smaller space, their transmission is not expensive. These instructions will apply to all public collections made previous to the Mission of Dr. HELPER to Tenasserim, should any such be still detained in the hands of individuals, or remain deposited in the Botanic Garden of Calcutta, or in charge of the Asiatic Society.

' We are, &c.

' LONDON.

' 16th September, 1840.

(Signed)

W. B. BAYLEY,

GEORGE LYALL,

W. ASTELL,

H. LINDSAY,

J. L. LUSHINGTON,

JOHN MASTERMAN,

J. W. HOGG,

J. THORNHILL,

N. B. EDMONSTONE,

R. CAMPBELL,

W. WIGRAM,

JOHN SHEPHERD,

F. WARDEN.

(True Copy,)

G. A. BUSHBY,

' Secretary to Government of India.'

List of Mammalia contained in the Museum of the East India Company.

Good Specimens of all QUADRUMANA are Desiderata in the Museum.

ORDO I.—PRIMATES.

TRIBUS QUADRUMANA.

Genus Hylobates, ..	..	..	..	..	..	<i>Illiger.</i>
1 Hylobates syndactylus,	..	..	..	..	..	<i>Raffles, Sumatra.</i>
2 ——— Hoolook,	..	..	..	..	..	<i>Harl. Assam.</i>
Genus Semnopithecus, ..	..	..	..	..	..	<i>Fr. Cuv.</i>
1 Semnopithecus melalophus,	..	..	..	..	..	<i>Sumatra.</i>
2 ——— cristatus,	..	..	..	..	..	<i>Raff. id.</i>
3 ——— femoralis,	..	..	..	..	..	<i>id.</i>
4 ——— Pyrrhus,	..	..	..	..	..	<i>id.</i>
5 ——— maurus,	..	..	..	..	..	<i>id.</i>
6 ——— Entellus,	..	..	..	..	..	<i>Madras.</i>

GENUS PRESBYTES.

1 Presbytes mitrata. Eschsch,	..	..	..	..	..	<i>Voy. Kotzebue.</i>
Semn. ? fascicularis, ..	..	..	..	..	..	<i>Raff. Sumatra.</i>
Semn. comatus, ..	..	..	..	..	..	<i>Desm. Mamm.</i>

GENUS CERCOPITHECUS.

1 Cercopithecus Johnii, ..	..	..	..	..	..	<i>Madras.</i>
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GENUS MACACUS. LACEP.

1 Macacus Sinicus, ..	..	..	..	..	..	<i>Java.</i>
2 ——— cynomolgus, ..	..	..	..	..	..	<i>Linn. Siam.</i>
3 ——— Silenus, ..	..	..	..	..	..	
4 ——— nemestrinus, ..	..	..	..	..	..	<i>Sumatra.</i>
5 ——— Assamensis, ..	..	..	..	..	..	<i>M'Clelland.</i>

LEMURIDÆ.

* Genus Tarsius, ..	..	..	..	..	..	<i>Storr.</i>
1 Tarsius Bancanus, ..	..	..	..	..	..	<i>Banca.</i>
Genus Nycticebus, ..	..	..	..	..	..	<i>Geoff.</i>
1 Nycticebus Javanicus,	..	..	..	..	..	<i>Java.</i>
2 ——— tardigradus,	..	..	..	..	..	<i>Siam.</i>

GENUS LEMUR.

1 Lemur ruber,						
* * Galeopithecidæ,						
Genus Galeopithecus,						
1 Galeopithecus variegatus,	..	..	..	..	..	<i>Java, &c.</i>

TRIBUS CHEIROPTERA.

Specimens of all CHEIROPTERA are desired, both skins, and especially entire subjects, in Spirits.

Genus Megaderma,	..	..	..	..	..	Geoff.
1 Megaderma Lyra,	..	..	..	..	..	Java.
Genus Rhinolophus,	..	..	..	..	..	Geoff.
1 Rhinolophus affinis,	..	..	..	..	..	Java.
2 ————— minor,	..	..	..	..	..	id.
3 ————— nobilis,	..	..	..	..	..	id.
4 ————— larvatus,	..	..	..	..	..	id.
5 ————— vulgaris,	..	..	..	..	..	id.
6 ————— deformis,	..	..	..	..	..	id.
7 ————— insignis,	..	..	..	..	..	id.
8 ————— Dukhunensis,	..	..	..	..	..	Dukhun.
Genus Nycteris,	..	..	..	..	..	Geoff.
1 Nycteris Javanica,	..	..	..	..	..	Geoff. Java.
Genus Nycticejus,	..	..	..	..	..	Rafflesque.
1 Nycticejus Temmenckii,	..	..	..	..	..	Horsf. Java.

GENUS VESPERTILIO.

1 Vespertilio adversus,	..	..	..	..	..	Horsf. Java.
2 ————— Hardwickii,	..	..	..	..	..	„ id.
3 ————— tralatitius,	..	..	..	..	..	„ id.
4 ————— imbricatus,	..	..	..	..	..	„ id.
5 ————— pictus,	..	..	..	..	..	Linn. id.
Genus Molossus,	..	..	..	..	..	Geoff.
1 Molossus tenuis,	..	..	..	..	..	Java.
———— dilatatus,	..	..	..	..	..	id.
?Genus Cheiromeles,	..	..	..	..	..	Horsf.
1 Cheiromeles torquatus,	..	..	..	..	..	id. Java.

Particularly desirable.

Genus Macroglossus,	..	..	..	..	..	Fr. Cuv.
1 Macroglossus rostratus,	..	..	..	..	..	Java.
2 ————— nanus,	..	..	..	..	..	Siam.

GENUS PTEROPUS.

1 Pteropus edulis.	..	..	..	..	..	Java, &c.
2 ————— Edwardsii, (Medius auctor),	..	..	..	..	..	Dukhun.
3 ————— Assamensis,	..	..	..	..	..	Assam.
4 ————— poliocephalus,	..	..	..	..	..	Siam.
5 ————— marginatus,	..	..	..	..	..	Siam.
1 Pteropus (Pachysoma titthecheilum,	..	..	..	..	..	Java.

ORDO II.—FERÆ.

* Felidæ.

Species of Hyæna: besides the vulgaris, are desirable.	{	Genus Hyæna,	Briss, &c.
		1 Hyæna vulgaris,	Dukhun.

GENUS FELIS.

The smaller species of Felis: several rare species from the Up- per Provinces.	{	1 Felis Tigris,	Linn. Dukhun.
		2 — Leopardus,	Dukhun.
		3 — Pardus,	Java, &c.
		4 — Chaus,	Guldenst. Dukhun.
		5 — Torquata,	Fr. Cuv. id.
		6 — Javanensis,	Java.
		7 — Sumatrana,	Sumatra.
		8 — Bengalensis,	Bengal.
		Genus Prionodon,	Horsf. Linsany, Tem.
Prionodon.		1 Prionodon gracile,	Horsf. Java.
? Indian species.		Genus Lutra,	Lin.
Lutra.	{	1 Lutra Leptonyx,	Horsf. Java.
		2 — Nair,	Fr. Cuv. Dukhun.
		Genus Mustela,	Linn.
Desideratum.		1 Mustela flavigula,	Hardwickii, Bengal.
		Genus Mangusta,	Olivier.
Several new species are found near the Himalayas.	{	1 Mangusta Javanica,	Horsf. Java.
		2 — grisea, Herp. gr. Desm.	Dukhun.
		3 — Pharaonis,	Madras.
		4 — Auropunetata,	Hodgs. Assam.

GENUS VIVERRA.

Viverra: Zibetha, Ci- vetta, any new species?	{	1 Viverra Zibetha,	Linn. Sumatra.
		2 — Rasse,	Horsf. Java, &c.
		3 — Indica,	Geoff. Dukhun.
		4 — Civetta,	Siam.
		Genus Paradoxurus.	F. Cuv.
Paradoxurus, seve- ral Indian species.	{	1 Paradoxurus typus,	Java, &c.
		Genus Arctictis. Actides Valencienna.	Temm.
		1 Arctictis Binturong,	Sumatra.

GENUS CANIS.

The smaller species of Canis.	{	1 Canis familiaris, var.	Dukhun.
		2 — pallipes,	Sykes, id.
		3 — aureus,	Linn. id.
		4 — Kokree,	Sykes, id.
		5 — rutilans,	Temm. Java.

** URSIDÆ.

		Genus Ailurus,	F. Cuv.
<i>Desideratum.</i>	1	Ailurus fulgens,	F. C. Nepaul.
		Genus Prochilus,	Illig.
<i>Prochilus one good specimen.</i>	}	1 Prochilus ursinus,	Illig. Dukhun.
		Genus Helaretos Ursus aurt. ..	Horsf.
	1	Helaretos Malayanus,	Horsf. Sumatra.
		Genus Gulo,	Storr.
<i>Gulo.</i>	1	Gulo orientalis,	Horsf. Java.
		Genus Mydaus,	F. Cuv.
	{	1 Mydaus collaris,	Bengal.
<i>Arctonyx.</i>		Arctonyx collaris,	F. Cuv.
	2	— meliceps,	id. Java.

** TALPIDÆ.

		Genus Sorex,	Linn.
<i>Sorex.</i>	{	1 Sorex Indicus,	Geoff.
	2	— Sonerattii,	Geoff.
		**** Genus Tupaia,	Raff.
	{	1 Tupaia Javanica,	Horsf. Java.
<i>Tupaia.</i>	2	— ferruginea,	Raff. Sumatra.

ORDO III. UNGULATA.

		Genus Antelope,	Pallas.
	1	Antelope picta,	Dukhun.
<i>Antelope. The new discovered species from the Himalayas.</i>	{	2 ——— Bennettii,	Sykes.
	3	——— Cervicapra,	id.
	4	——— Hodgsonii,	Bengal.
	5	——— Thar,	Hodgs. id.
		Genus Moschus,	Linn.
<i>M. moschiferus, Des.</i>	1	Moschus moschiferus,	Nepal.
<i>Common.</i>	{	2 ——— Javanicus,	Java.
	3	——— Memima,	Bengal.
		Genus Cervus,	Linn.
	{	1 Cervus equinus,	Rusa Sumatra.
<i>Desiderat.</i>	2	——— Duvancelii,	Cuv. Horns. India.
	3	——— Muntjak,	Java, Dukhun.
	4	——— porcinus,	Assam.
		Genus Tapirus.	
	1	Tapirus Malayanus.	
		Genus Manis,	Linn.
	{	1 Manis Javanica,	Derm. Java.
<i>M. Crassicaudata.</i>	2	—— crassicaudata,	Griff. Dukhun.

ORDO IV. GLIRES.

		Genus Sciurus,	Linn.
<i>All the species of Sciurus are desirable.</i>	1	Sciurus maximus,	Schr. Madras.
	2	— Elphinstonii	Sykes, Dukkan.
	3	— Leschenaultii,	Derm. Sumatra.
	4	— bicolor,	Sparr. Java.
	5	— giganteus,	M'Clelland, Assam.
	6	— nigrovittatus,	Horsf. Java.
	7	— Finlaysonii,	Horsf. Siam.
	8	— affinis,	Raff. Sumatra.
	9	— tenuis,	Horsf. Siam.
	10	— Plantani,	Lyng. Java.
<i>Desiderat.</i>	11	— Palmarum,	Briss. Dukkan.
	12	— bivittatus,	F. Cuv. Sumatra.
	13	— insignis,	F. Cuv. Java.
	14	— hippurus,	Geoff. Assam.
	15	— Lokriah,	Hodg. id.
	16	— Lokrioides,	Hodg. id.
	17	— M'Clellandii,	Horsf. id.
<i>Desiderat.</i>		Genus Pteromys,	Geoff.
	1	Pteromys Petaurista,	Desm. Bengal.
	2	— nitidus,	Siam.
	3	— Diardii,	Java.
	4	— genibarbis,	id.
<i>Common.</i>	5	— lepidus	id.
		Genus Lepus,	Linn.
<i>Desiderat.</i>	1	Lepus nigricollis,	F. Cuv. Dukkan.
		Genus Hystrix,	Linn.
<i>Desiderat.</i>	1	Hystrix leucurus,	Sykes.
		Genus Mus,	Linn.
<i>Very desirable.</i>	1	Mus giganteus,	Bengal.
	2	— setifer,	Horsf. Java.
	3	— decumanoides,	Temm. Bengal.
	4	— indicus,	Siam.

ORDO V.

FAM. HALICORIDÆ.

GENUS HALICORE.

1	Halicore Dugong,	..	Raff. Sumatra.
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AVES.

ORDO I. RAPTORES. ILL.

FAM. II. VULTURIDÆ.

SUBFAM. XXX.

Good Specimens of all the Raptores are desiderata, excepting a few of the most common species.

GENUS VULTUR.

1	Vultur Indicus,	..	..	<i>Lath, Dukhun.</i>
2	———— Ponticerianus,	..	..	<i>Lath, id.</i>
3	———— Bengalensis, ..	..	..	<i>Gmel. id.</i>
4	———— leuconotus, ..	..	..	<i>Bengal.</i>

Subfam. xxxxx.

GENUS NEOPHRON, SAV.

1	Neophron Perenopterus, ..	..	..	<i>Dukhun.</i>
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FAM. III. FALCONIDÆ.

Subfam. X. Aquilina.

GENUS PANDION, SAV.

1	Pandion Ichthyæstus, ..	..	..	<i>Java.</i>
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GENUS HALIÆTUS, SAV.

Common.

1	Haliæstus Ponticerianus,	..	..	<i>Java, Sumatra, &c.</i>
2	———— dimidiatus, ..	..	..	<i>Sumatra.</i>
3	———— albicilla, ..	..	..	<i>Raff. Sumatra.</i>
4	———— Macei, ..	..	..	<i>Assam.</i>

GENUS LIMNÆTUS, VIGORS.

1	Limnætus Horsfieldii, ..	..	..	<i>Java.</i>
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GENUS AQUILA.

1	Aquila bifasciata, ..	..	..	<i>Dukhun.</i>
2	———— Vindhiana?			
3	———— pennata, ..	..	..	<i>F. pennata, Briss.</i>

GENUS SPIZÆTUS, VIEILLLOT.

1	Spizætus rufinctus, ..	..	..	<i>M'Clelland, Assam.</i>
2	———— cristatellus?	..	..	<i>Madras.</i>

GENUS HÆMATORNIS, VIG.

1	Hæmatornis Bacha, ..	..	..	<i>Java, Sumatra.</i>
2	———— undulatus, ..	..	..	<i>Vig. Nipal.</i>

xx. Subfam Accipitrina,

GENUS ACCIPITER.

- | | | | | |
|---|------------------------|----|----|-----------------------|
| 1 | Accipiter Dukhunensis, | .. | .. | Sykes, <i>Dukhun.</i> |
| 2 | —— fringillarius, | .. | .. | <i>Sumatra.</i> |
| 3 | —— Soloensis, | .. | .. | <i>Horsf. Java.</i> |

GENUS ASTUR AUCT.

- | | | | | |
|---|--------------|----|----|-----------------------|
| 1 | Astur Hyder, | .. | .. | Sykes, <i>Dukhun.</i> |
|---|--------------|----|----|-----------------------|

xxx Subfam Falconina.

GENUS HIERAX, VIGORS.

- | | | | | |
|---|---------------------|----|----|--------------|
| 1 | Hierax cærulescens, | .. | .. | <i>Java.</i> |
|---|---------------------|----|----|--------------|

GENUS FALCO.

- | | | | | |
|---|-------------------|----|--------------------------|-----------------------|
| 1 | Falco peregrinus, | .. | .. | <i>Bengal.</i> |
| 2 | —— Tinnunculus, | .. | .. | <i>Java.</i> |
| 3 | —— interstinctus, | .. | M ^c Clelland, | <i>Assam, Madras.</i> |
| 4 | —— severus, | .. | .. | <i>Horsf. Java.</i> |
| 5 | —— Chiquera, | .. | .. | <i>Lath, Dukhun.</i> |

Good Specimens generally are desiderata.

xxxx. Subfam Buteonina.

GENUS CIRCUS.

- | | | | | |
|---|------------------|----|----|-----------------------|
| 1 | Circus pallidus, | .. | .. | Sykes, <i>Dukhun.</i> |
| 2 | —— variegatus, | .. | .. | Sykes, <i>Dukhun.</i> |
| 3 | —— melanoleucus, | .. | .. | <i>Assam.</i> |

xxxxx. Subfam Milvina.

GENUS MILVUS.

- | | | | | |
|---|-----------------|----|----|-----------------------|
| 1 | Milvus Govindo, | .. | .. | Sykes, <i>Dukhun.</i> |
|---|-----------------|----|----|-----------------------|

GENUS ELANUS, SAV.

- | | | | | |
|---|----------------------|----|----|----------------------------|
| 1 | Elanus melanopterus, | .. | .. | <i>Java, Siam, &c.</i> |
|---|----------------------|----|----|----------------------------|

FAM: IV. STRIGIDÆ.

x Subfam Nocturnina.

GENUS NOCTUA, SAV.

- | | | | | |
|---|----------------|----|----|-----------------|
| 1 | Noctua Indica, | .. | .. | <i>Dukhun.</i> |
| 2 | —— hirsuta, | .. | .. | <i>Sumatra.</i> |

xx. Subfam Bubonina.

GENUS KETUPA, LESSON.

- | | | | | |
|---|-----------------------|----|----|--------------|
| 1 | Ketupa Leschenaultii, | .. | .. | <i>Siam.</i> |
| 2 | —— Ceylonensis, | .. | .. | <i>Java.</i> |

xxx. Subfam Assionina.

GENUS OTUS, CUV.

1	Otus Bengalensis,	..	..	<i>Frauhl. Duhun.</i>
2	— Orientalis,	..	..	<i>Horsf. Java.</i>
3	— Lempige,	..	..	<i>Horsf. id.</i>
4	— rufescens,	..	..	<i>Horsf. id.</i>

xxxx.—Subfam Strigidae.

GENUS STRIX.

1	Strix Javanica,	..	..	<i>Horsf. Java.</i>
2	— badia,	..	..	<i>Horsf. id.</i>
3	— Selo puto,	..	..	<i>Horsf. id.</i>
	Pagodarum,			<i>Temm.</i>
4	— castanoptera,	..	..	<i>Horsf. id.</i>

ORDO II.—INSESSORES.

Tribus, I.—*Fissirostres.*Fam. I.—*Meropidae.*

GENUS MEROPS, LINN.

<i>Merops—all the Indian } species.</i>	1	Merops Javanicus,	..	..	<i>Horsf. Java.</i>
		Savignii,			<i>Temm.</i>
	2	— Adansonii,	..	..	<i>Sumatra.</i>
	3	— urica,	..	..	<i>Horsf. Java.</i>
	4	— viridis,			<i>Linn.</i>

GENUS NYCTIOMIS, SWAINSON.

<i>Particularly.</i>	1	Nyctiomis Athertonii,	..	..	<i>Assam.</i>
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Fam: II. Hirunidae.

GENUS CYPSELUS.

<i>Desiderat.</i>	1	Cypselus comatus,	..	..	<i>Siam.</i>
	2	— affinis,			<i>Hard and Gray, Duhun.</i>
	3	— Klecho,	..	..	<i>Horsf. Java.</i>
		longipennis,			<i>Temm.</i>
	4	— — — — —	..	..	<i>Sumatra.</i>

GENUS HIRUNDO.

<i>Desiderat.</i>	1	Hirundo esculenta,	..	..	<i>Java.</i>
	2	— fuciphaga,	..	..	<i>id.</i>
	3	— filifera,	..	..	<i>Duhun.</i>
	4	— Sewan,	..	..	<i>Sykes, id.</i>
	5	— concolor,	..	..	<i>Sykes, id.</i>
	6	— erythropygia,	..	..	<i>Sykes, id.</i>
	7	— brevirostris,	..	..	<i>M'Clelland, Assam.</i>
	8	— brevicaudata,	..	..	<i>M'Clelland, id.</i>

Fam: III. Caprimulgidæ.

GENUS CAPRIMULGUS.

<i>Desiderat.</i>	 {	1	Caprimulgus affinis, ..	..	<i>Horsf. Java.</i>
		2	———— macrourus, ..	..	<i>Horsf. id.</i>
		3	———— asiaticus, ..	..	<i>Madras.</i>
		4	———— monticulus, ..	..	<i>Frank, Dukkun.</i>
		5	Caprimulgus Mahrattensis, ..	..	<i>Sykes, Dukkun.</i>

GENUS PODARGUS.

<i>Podargus, Continental species.</i>	Conti- } 1	<i>Podargus Javensis, ..</i>	..	<i>Horsf. Java.</i>
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Fam. IV. Todidæ.

GENUS EURYLAIMUS, HORSF.

<i>Desiderat.</i>	{	1	Eurylaimus Horsfieldii ..	..	<i>Temm, Java.</i>
		2	———— ochromalus, ..	..	<i>Raff. Sumatra.</i>
		3	———— lunatus, ..	..	<i>Gould, Assam.</i>

GENUS EURYSTOMUS VIEILL (Coloris Cuv.)

<i>Common.</i>	1	Euryetomus Orientalis. ..	..	<i>Java.</i>
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Fam. V. Halcyonidæ.

GENUS DACELO, LEACH.

<i>Indian species.</i>	1	<i>Dacelo pulchella, ..</i>	..	<i>Horsf. Java.</i>
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GENUS HALCYON, SWAINS.

<i>Most of these are common. New species desirable.</i>	{	1	Halcyon leucocephalus, ..	..	<i>Java.</i>
		2	———— coromandelicus, ..	..	<i>id.</i>
		3	———— chlorocephalus, ..	..	<i>id.</i>
		4	———— Sacer, ..	..	<i>id.</i>
		5	———— onmicolor, ..	..	<i>id.</i>
		6	———— albicapillus, ..	..	<i>Sumatra.</i>
		7	Smyrnenensis, ..	..	<i>Dukkun.</i>

GENUS ALCEDO.

<i>Alcedo all the Continental species.</i>	Con- {	1	Alcedorudis, ..	..	<i>Linn. Dukkun.</i>
		2	———— Bengalensis, ..	..	<i>Geml. id.</i>
		3	———— Meninting, ..	..	<i>Horsf. Java.</i>
		4	———— Biru, ..	..	<i>Horsf. id.</i>
5 <i>Desiderat.</i>		5	———— Guttata, ..	..	<i>Gould, Siam, Bengal.</i>

GENUS CEYX.

1	<i>Ceyx tridactyla ..</i>	..	<i>Java.</i>
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Tribus II. Dentirotres,

Fam. I. Muscipidæ.

GENUS MUSCIPETA.

<i>Common.</i>	 {	1	Muscipeta Indica, ..	..	<i>Stephens, Dukkun.</i>
		2	———— Paradisii, ..	..	<i>id.</i>

GENUS PHENICORNIS, SWAINS.

<i>Desiderata.</i>		1	<i>Phenicornis flammea</i> ,	..	<i>Java, Assam.</i>
		2	———— <i>peregrina</i> ,	..	<i>id.</i>
		3	———— <i>princeps</i> ,	..	<i>Gould, Assam.</i>
		4	———— <i>elegans</i> ,	..	<i>M'Clelland, id.</i>
		5	———— <i>curvirostris</i> ,	..	<i>Assam.</i>
		6	———— <i>affinis</i> ,	..	<i>Dukhun.</i>

GENUS MUSCICAPA.

<i>Muscicapa generally desirable.</i>	{	1	<i>Muscicapa Indigo</i> ,	..	<i>Horsf. Java.</i>
		2	———— <i>Bangumas</i> ,	..	<i>Horsf. id.</i>
		3	———— <i>obscura</i> ,	..	} <i>Horsf. id.</i>
			———— <i>hirundina</i> ,	..	
		4	———— <i>melanops</i> ,	..	<i>Gould, Dukhun.</i>
		5	———— <i>Poonensis</i> ,	..	<i>Sykes, id.</i>
		6	———— <i>cœruleocephala</i> ,	..	<i>id.</i>
		7	———— <i>picata</i> ,	..	<i>Sykes, id.</i>
		8	———— <i>capitalis</i> ,	..	<i>M'Clelland, Assam.</i>
		9	———— <i>cœrulea</i> ,	..	<i>Sumatra.</i>

GENUS RHIPIDURA, VIGORS.

<i>Desiderata.</i>		{	1	<i>Rhipidura Javanica</i> ,	..	<i>Java.</i>
			2	———— <i>fusciventris</i> ,	..	<i>Dukhun.</i>
			3	———— <i>albipunctata</i> ,		

GENUS CRYPTOLOPHA, SWAINSON.

<i>Cryptolopha—particularly.</i>	}	1	<i>Cryptolopha poiocephala.</i>
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FAM. II. LANIADÆ.

xx. Subfam: Dicrurine, Swains. †

		Genus <i>Artamus</i> ,	..	<i>Vieillot. Ocypterus, Cuv.</i>
<i>Common.</i>		1 <i>Artamus leucorhynchus</i> ,	..	<i>Java.</i>
		Genus <i>Diermus</i> ,		<i>Vieillot.</i>
<i>Common.</i>	{	1 <i>Dicrurus forficatus</i> ,	..	<i>Java.</i>
		2 ——— <i>cinereus</i> ,	..	<i>Horsf. id.</i>
<i>Additional common species!</i>		3 ——— <i>Malabaricus</i> ,	..	<i>id.</i>
		4 ——— <i>Balicassius</i> ,	..	<i>Dukhun.</i>
		5 ——— <i>grandis</i> ,	..	<i>Gould, Assam.</i>
		6 ——— <i>Rangoonensis</i> ,	..	<i>Gould, id.</i>
		7 ——— <i>æneus</i> ,	..	<i>Viell. id.</i>

GENUS TRICOPHORUS. TEMM.

<i>Desiderat.</i>		{	1 <i>Tricophorus barbatus</i> ,	..	<i>Java.</i>
			2 ————— <i>flaveolus</i> ,	..	<i>Gould, Assam.</i>

xxx. Subfam. Laniinae. Swains.

GENUS HYPSSIPETES, VIGORS.

<i>Desiderat.</i>		{	1 <i>Hypsipetes Ganesa</i> ,	..	<i>Sykes, Dukkum.</i>
			2 ————— <i>pearoides</i> ,	..	<i>Gould.</i>
<i>Particularly.</i>		{	3 —————		<i>McClellandii, Assam.</i>
			4 ————— <i>gracilis</i> ,	..	<i>id.</i>

GENUS COLLURIO, VIGORS.

<i>Other Continental species desirable.....</i>	{	1 <i>Collurio Bentet</i> ,	..	<i>Horsf. Java.</i>
		2 ————— <i>Hardwickii</i> ,	..	<i>Vig. Dukkum.</i>
		3 ————— <i>erythronotus</i> ,	..	<i>id.</i>
		4 ————— <i>Schach</i> ,	..	<i>id.</i>
		5 ————— <i>Lathora</i> ,	..	<i>id.</i>

GENUS LANIUS, AUCT.

<i>Desiderat.</i>	{	1 <i>Lanius rufus</i> ,	..	<i>Sumatra.</i>
		2 ————— <i>virgatus</i> ,	..	<i>Temm. id.</i>
		3 ————— <i>muscipoides</i> ,	..	<i>Dukkum.</i>
		4 ————— <i>undularis</i> ?	..	<i>Dukkum.</i>

xxxx. Subfam. Thamnophilina.

GENUS VANGA.

1 <i>Vanga coronata</i> ,	..	<i>Vigors, Sumatra.</i>
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xxxxx. Subfam. Cebblepyrinae, Swains.

GENUS GRAUCALUS, CUV.

<i>Common Desiderat.</i>	{	<i>Graucalus Papuensis</i> ,	..	<i>Java, Dukkum.</i>
		———— <i>maculosus</i> ,		<i>McClelland, Assam.</i>

GENUS CEBLEPYRIS, CUV. CAMPEPHAGA, VIEILL.

<i>Cebblepyris fimbriatus</i> ,	..	<i>Temm. Java, Dukkum.</i>
———— <i>canus</i> ,	..	<i>Dukkum.</i>
———— <i>striga</i> ,	..	<i>Horsf. Java.</i>

FAM III. MERULIDÆ.

x. Subfam Myiotherina, Swains.

GENUS PITTA, TEMM.

All the species of Pit- ta are Desiderata.	{	1	Pitta cyanura,	..	Java.
		2	— gigas,		Temm. Sumatra.
		3	— thoracina,		Temm. Sumatra.
		4	— brachyuara,	..	Madras.
		5	—	..	Sumatra.

GENUS CINCLUS, BECHST.

Desiderat.		1	Cinclus Asiaticus,	..	Swains.
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xx. Subfam Merulinæ.

GENUS MYOPHONUS, TEMM.

1	Myophonus glaucinus,	..	Temm. Java.
2	— metallicus,	..	Java.
3	— Temminckii,	..	Gould, Bengal.

GENUS CINCLUSOMA, VIG.

Desiderat.		1	Cinclosoma strigatum.
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GENUS TURDUS.

Common.		1	Turdus Saularis,	..	Dukhun.
		2	— amoenus,	..	Java.
		3	— macrurus,	..	Java.
		4	— vividis,	..	Horsf. Java.
		5	— concolor,	..	Horsf. id.
		6	— vacuus,	..	Horsf. id.
		7	— ophiocephalus,	..	id.
		8	— perspicellatus,	..	Sumatra.
		9	— albicollis,	..	Royle, Bengal.
		10	— pœcilopterus,	..	id.
		11	— melanocephalus,	..	Sumatra.
		12	— cyanotus,	Jard. and Selly,	Bengal?
		13	— erythrogaster,	..	Gould, id.

All these species are
rare and Desiderata.

GENUS IXOS, TEMM.

Desiderat.	 {	1	Ixos cucullatus,	Hooded Th. Lath,	Bengal.
		2	— melanocephalus,	..	Bengal.
		3	— chrysorhæus,	..	Java.
Common.	 {	4	— Cafer, Boolbool,	..	Dukhun.
		5	— Psidii,	..	Java.
		6	— Finlanysonii,	..	Sumatra.
		7	— Jocosus,	..	Dukhun.

8	<i>Ixos fulicatus</i> ,	..	<i>Dukhun.</i>
9	— <i>bimaculatus</i> ,	..	<i>Java.</i>
10	— <i>dispar</i> ,	..	<i>Java.</i>

GENUS GARRULAX, LESS. IANTHOCIN GLD.

Species of <i>Garrulax</i> , Lesson, or <i>Ianthocinii</i> . Gould, are very desir- able.	1	<i>Garrulax gularis</i> ,	..	<i>M'Clelland, Assam.</i>
	2	— <i>pectoralis</i> ,	..	<i>Gould, id.</i>
	3	— <i>lunaris</i>	..	<i>M'Clelland, Assam.</i>
	4	— <i>albogularis</i> ,	..	<i>Gould, Bengal.</i>
	5	— <i>leucolophus</i> ,	..	<i>id.</i>

GENUS GEOCICHLA.

1	<i>Geocichla rubecola</i> ,	..	<i>Bengal.</i>
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GENUS ZOOTHERA, VIGORS.

Rare and very desirable.	1	<i>Zoothera monticola</i> ,	..	<i>Bengal.</i>
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xxx. Subfam Oriolina.

GENUS ORIOLOUS, AUCT.

Particularly.	1	<i>Oriolus Chinensis</i> ,	..	<i>Linn. Java.</i>
	2	— <i>Xanthonotus</i> ,	..	<i>Horsf. Java.</i>
	3	— <i>melanocephalus</i> ,	..	<i>Siam, &c.</i>
	4	— <i>Galbula</i> ,	..	<i>Linn. Dukhun.</i>
	5	— <i>Kundii</i> ,	..	<i>Sykes, Dukhun.</i>
	6	— <i>Traillii</i> ,	..	<i>Gould, Cent., Assam</i>

GENUS IRENA, HORSF.

1	<i>Irena Puella</i> ,	<i>F. Cuv. Puella Lath, Java, Siam.</i>
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xxxx. Subfam Coesymphina.

GENUS TIMALIA, HORSF.

Species of <i>Timalia</i> generally desirable.	1	<i>Timalia pileata</i> ,	..	<i>Horsf. Java, &c.</i>
	2	— ? <i>gularis</i> ,	..	<i>Horsf. Java.</i>
	3	— <i>Malcolmi</i> ,	..	<i>Sykes, Dukhun.</i>
	4	— <i>Somervillii</i> ,	..	<i>Sykes, id.</i>
	5	— <i>Chatarcea</i> ,	..	<i>Frankl. id.</i>
	6	— <i>hypoleuca</i> ,	..	<i>Frankl. Madras.</i>

xxxx.

GENUS PETROCINELA, VIGORS.

Desiderata.	1	<i>Petrocinela Pandu</i> ,	..	<i>Sykes, Dukhun.</i>
	2	— <i>Malab</i> ,	..	<i>Sykes, id.</i>
	3	— <i>cinchiorhyncha</i> ,	..	<i>id.</i>

Fam IV. Sylviadæ.

Subfam x.

GENUS IÖRA, HORSF.

Additional species?	1	<i>Iöra scapularis</i> ,	..	<i>Java, Siam.</i>
	2	— <i>Typhia</i> ,		
	3	— <i>meliceps</i> ,	..	<i>Dukhun.</i>

Subfam xx.

GENUS BRACHYPTERYX, HORSF.

- Several India species of Brachypteryx, which have been indicated, are very desirable.
- | | | | | |
|---|---|-----------------------|----|--------------|
| { | 1 | Brachypteryx montana, | .. | Horsf. Java. |
| | 2 | ———— ? sepiaria, | .. | id. |

Subfam xxx. Sylviana.

GENUS SYLVIA.

- Desiderat.
- | | | | | |
|---|---|------------------|----|----------------|
| { | 1 | Sylvia Javanica, | .. | Prinia, Java. |
| | 2 | ———— montana, | .. | Prinia, Java. |
| | 3 | Sylvia Rama, | .. | Sykes, Dukhun. |
| | 4 | ———— Sylviella, | .. | Sykes, id. |

GENUS PRINIA.

- All the Continental species.
- | | | | | |
|---|---|--------------------|----|----------------|
| { | 1 | Prinia familiaris, | .. | Horsf. Java. |
| | 2 | ———— socialis, | .. | Sykes, Dukhun. |
| | 3 | ———— inornata, | .. | Sykes, id. |

Gen. Zosterops, Vig. and Horsf. see below.

GENUS ORTHOTOMUS, HORSF.

- Desiderata.
- | | | | | |
|---|---|--------------------|----|----------------|
| { | 1 | Orthotomus sepium, | .. | Horsf. Java. |
| | 2 | ———— Benetti, | .. | Sykes, Dukhun. |
| | 3 | ———— Lingoo, | .. | Sykes, id. |

xxxx. Subfam Motacillina.

GENUS MOTACILLA, AUCT.

- | | | | |
|---|----------------------|----|-------------------|
| 1 | Motacilla variegata, | .. | Stephens, Dukhun. |
| 2 | ———— Dukhunensis, | .. | Sykes, id. |

GENUS BUDYTES, CUV.

- | | | | |
|---|----------------------------|----|----------------|
| 1 | Budytes flava (Mat flava,) | .. | Java, Sumatra. |
| 2 | ———— citreola (Mat. cit.) | .. | Dukhun. |
| 3 | ———— melanocephala, | .. | Sykes, id. |
| 4 | ———— Beema, | .. | Sykes, id. |

GENUS ENICURUS, TEMM.

- Species of Enicurus desired.
- | | | | | |
|---|---|---------------------|----|----------------|
| { | 1 | Enicurus coronatus, | .. | Temm. Java. |
| | 2 | ———— velatus, | .. | Temm. id. |
| | 3 | ———— maculatus, | .. | Gould, Bengal. |

GENUS ANTHUS, BECHSTEIN.

- | | | | |
|---|----------------|----|----------------|
| 1 | Anthus agilis, | .. | Sykes, Dukhun. |
| 2 | ———— ? | .. | Sumatra. |

GENUS MEGALURUS, HORSF.

- Continental species ?
- | | | | | |
|---|---|----------------------|----|----------------|
| { | 1 | Megalurus palustris, | .. | Horsf. Java. |
| | 2 | ———— ? ruficeps, | .. | Sykes, Dukhun. |

xxxxx Subfam Saxicolina.

GENUS SAXICOLA, BECHSTEIN.

- Desiderata.
- | | | | | |
|---|---|--------------------|----|---------------------|
| { | 1 | Saxicola caprata. | .. | Java, &c. |
| | 2 | ———— Rubicola, | .. | Temm. Dukhun. |
| | 3 | ———— Rubicoloides, | .. | Sykes, id. |
| | 4 | ———— bicolor, | .. | Sykes, id. |
| | 5 | ———— erythropgia, | .. | Sykes, id. |
| | 6 | ———— olivea, | .. | M. Clelland, Assam. |

GENUS PHÆNICURA, JARD AND SELBY.

<i>Desiderata.</i>	.. {	1 <i>Phœnicura atrata</i> ,	<i>Jard. and Selby, Dukkun.</i>
		2 ——— <i>frontalis</i> ,	<i>Gould. Cent. Bengal.</i>
		3 ——— <i>cæruleocephala</i> ,	.. <i>Gould. Cent. id.</i>
		4 ——— <i>leucocephala</i> ,	.. <i>Gould. Cent. id.</i>
		5 ——— <i>Reevesii</i> ,	.. <i>Gray, Assam.</i>

GENUS ZOSTEROPS, VIGORS AND HORSP.

<i>Additional Continental species ?</i>	 }	<i>Zosterops Maderaspatanus</i> ,	..	<i>Java.</i>
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FAM V. PIPRIDÆ.

GENUS PARUS, LINN.

<i>Several other Indian species are indicated.</i>	{	1 <i>Parus atriceps</i> ,	..	<i>Horsf. Java.</i>
		2 — <i>xanthogenus</i> ,	<i>Vig. Gld. Cent. Dukkun.</i>	
		3 — <i>erythrocephalus</i> ,	<i>Gld. Cent. Bengal.</i>	
		4 — <i>monticolus</i> ,	..	<i>Gld. Cent. id.</i>
		5 — — — — —	..	<i>id.</i>

Genus *Melanochlora*.

GENUS MELANOCHLORA, LESS. PARUS. LAF. MCCLELLAND.

<i>Particularly.</i>	.. {	1 <i>Melanochlora flavocristata</i> ,	..	<i>Assam.</i>
		<i>Parus flavocristatus</i> ,		<i>Lafr.</i>

GENUS CALYPTOMENA, RAFF.

<i>Particularly.</i>		1 <i>Calyptomena viridis</i> .	..	<i>Raff. Sumatra.</i>
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GENUS LIOTHRIX, SWAINSON.

<i>Leiothrix is a very interesting Genus and all Indian species are Desiderata.</i>	{	1 <i>Liothrix lepida</i> ,	..	<i>M'Clelland, Assam.</i>
		2 ——— <i>signata</i> ,	..	<i>M'Clelland, id.</i>
		3 ——— <i>ornata</i> ,	..	<i>M'Clelland, id.</i>

Tribus III. Conirostres, Cuv.

I. FAM. FRINGILLIDÆ.

xx. Subfam Alaudina.

GENUS EMBERIZA, LINN.

<i>Desiderata.</i>	 {	1 <i>Emberiza cristata</i> ,	..	<i>Vigors, Dukkun.</i>
		2 ——— <i>subcristata</i> ,	..	<i>Sykes, id.</i>
		3 ——— <i>malanocephala</i> ,	..	<i>Sykes, id.</i>
		4 ——— <i>Cia</i> ,	..	<i>Bengal.</i>

GENUS ALAUDA, LINN.

1 <i>Alauda Gulgula</i> ,	..	<i>Frankl. Dukkun.</i>
2 ——— <i>Deva</i> ,	..	<i>Sykes, id.</i>

GENUS LINARIA.

<i>Common.</i>		1 <i>Linaria Amandava</i> ,	..	<i>Java.</i>
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GENUS MIRAFRA, HORSP.

<i>Species of Mirafra desired.</i>	 {	1 <i>Mirafra Javanica</i> ,	..	<i>Horsf. Java.</i>
		2 ——— <i>phœnicura</i> ,	..	<i>Frankl. Dukkun.</i>
		3 ——— <i>Assamica</i> ,	..	<i>M'Clelland, Assam.</i>
		4 ——— <i>flavellcolliis</i>	..	<i>M'Clelland, id.</i>

xxx. Subfam Carduelina.

GENUS CARDUELIS, BRISS.

- | | | |
|---|---------------------|----------------------|
| 1 | Carduelis caniceps, | Gould, Cent. Bengal. |
| 2 | ———— spinoides, | .. id. id. |

GENUS PLOCEUS, CUV.

- | | | |
|---|-----------------------|---------------|
| 1 | Ploceus Philippensis, | .. Java. |
| 3 | ———— Mangar, | .. Horsf. id. |

xxxx. Subfam Passernia.

GENUS FRINGILLA.

- | | | | |
|-------------------|---|------------------------|-------------------------|
| | 1 | Fringilla punctularia, | .. Lcep. Linn. Java. |
| | 2 | ———— striata, | .. Ls. Linn. id. |
| | 3 | ———— oryzivora, | .. id. |
| | 4 | ———— Maja, | .. id. |
| | 5 | ———— crucigera, | .. Temm. Dukkun. |
| Desiderat. { | 6 | ———— Rhodopepla, | Gld. Cent. Bengal. |
| | 7 | ———— montana? | Sumatra. |

GENUS PASSER, AUCT.

- | | | |
|---|--------------------|-------------------|
| 1 | Passer domesticus, | .. Briss. Dukkun. |
|---|--------------------|-------------------|

GENUS LONCHURA, SYKES.

- | | | | |
|-------------------|---|---------------------|-----------------------|
| | 1 | Lonchura misoria, | .. Dukkun. |
| | 2 | ———— Cheet, | .. Sykes, id. |
| | 3 | ———— leuconota, | .. Sykes, id. |
| Desiderat. { | 4 | ———— sphura, | .. Java. |
| | 5 | ———— melanocephala, | .. M'Clelland, Assam. |

II. FAM STURNIDÆ.

xx. Subfam Sturnina.

GENUS STURNUS, LINN.

- | | | |
|---|-------------------|-----------|
| 1 | Sturnus vulgaris, | .. China. |
|---|-------------------|-----------|

GENUS LAMPROTORNIS.

- | | | | |
|---------------------|---|--------------------|----------------------|
| | 1 | Lamprotornis, | .. Cantor, Java. |
| Desideratum. { | 2 | ———— spiloptychus, | .. Gld. Cent. Assam. |
| | 3 | | |

GENUS PASTOR, TEMM.

- | | | | |
|--|---|---------------------|--------------------------|
| | 1 | Pastor griseus, | .. Horsf. Java. |
| | 2 | ———— Mahrattensis, | .. Sykes, Dukkun. |
| | 3 | ———— capensis, | .. P. Jalla Horsf. Java. |
| | 4 | ———— tricolor, | .. Horsf. id. |
| | 5 | ———— tristis, | .. Gracula Linn. Dukkun. |
| | 6 | ———— roseus, | .. Temm. Dukkun, &c. |
| | 7 | ———— Pagodarusu, | .. Temm. id. |
| | 8 | ———— cristatellus, | |
| | 9 | ———— leucocephalus, | |
- Several other species of Pastor are indicated and a complete series is very much wanted.

III. FAM CORVIDÆ.

xx. Subfam Corvina.

GENUS PICA, BRISS.

<i>Magpie.</i>	{	1 <i>Pica erythrorhyncha</i> ,	<i>Gml. Linn. China.</i>
		* 2 — caudata, ..	<i>Briss Ray, &c. Sumatra.</i>

GENUS DENDROCITTA, GOULD.

<i>Desiderata.</i>	 {	1 <i>Dendrocitta Sinensis</i> ,	
		2 ————— <i>vagabunda</i> ,	.. <i>Assam.</i>
		3 ————— <i>leucogastra</i> ,	.. <i>Gld. Madras.</i>
		4 ————— <i>frontalis</i> ,	.. <i>M'Cld. Assam.</i>

GENUS KITTA, KÜHL.

- 1
- Kitta venatorius*
- .

GENUS CORVUS, AUCT.

<i>Additional species.</i>	{	1 <i>Corvus Corone</i> ,	.. <i>Sumatra.</i>
		2 ————— <i>splendens</i> ,	.. <i>Dukhun.</i>
		3 ————— <i>culminatus</i> ,	.. <i>id.</i>
		4 ————— <i>Enca</i> ,	.. <i>Horsf. Java.</i>

xxx. Subfam Coracina.

GENUS CORACIAS, LINN.

<i>Common.</i>	 {	1 <i>Coracias indica</i> ,	.. <i>Linn. Sumatra.</i>
		2 ————— <i>affinis</i> ,	.. <i>McClell. Assam.</i>

GENUS GRACULA, AUCT. EULABES CUV.

- 1
- Gracula religiosa*
- , ..
- Auct, Java, &c.*

GENUS CRYPSIRINA, VIEILL.

<i>Other species of Crypsirina?</i>	1 <i>Crypsirina</i> ,	.. <i>Java.</i>
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GENUS GARRULUS, BRISS.

- 1 *Garrulus lanceolatus*, .. *Gld. China.*
 2 ————— *bispecularis*, .. *Gld. Bengal.*

GENUS FREGILUS, CORACIA BRISS, GRAY, GM. CUV.

- 1
- Fregilus graculus*
- ,
- Sumatra.*

IV. FAM BUCERIDÆ.

GENUS BUCEROS.

<i>Several recently discovered Indian species desired.</i>	 {	1 <i>Buceros Rhinoceros</i> ,	 <i>Linn. Sumatra.</i>
		2 ————— <i>undulatus</i> ,	 <i>Shaw, Java.</i>
		3 ————— <i>Malabaricus</i> ,	 <i>Lath, id.</i>
		4 ————— <i>cavetus?</i>	<i>Homrai, Hodgson, Sumatra.</i>
		5 ————— <i>gingeanus</i> ,	 <i>Madras, &c.</i>

V. FAM LOXIADÆ, IGORS.

GENUS PARADOXORNIS, GOULD, PROCEED. ZOOL. SOC.

<i>Particularly.</i>	1 <i>Paradoxornis flavirostris</i> ,	.. <i>Gould, Assam.</i>
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TRIBUS IV.

II. FAM PSITTACIDÆ.

x. Subfam Psittacina.

GENUS PSITTACUS.

All the species of this Genus.	1	Psittacus sulphureus,	..	Sumatra.
	2	— ornatus,	..	Sumatra.

xxxx. Subfam. Palæorninia.

GENUS PALÆORNIS, VIGORS.

Species of Palæornis generally desired.	1	Palæornis Pondicerianus,	..	Java, &c.
	2	— torquatus,	..	Sumatra.
	3	— flavitorquis,	..	Shaw.
	4	— Malaccensis,	..	Java.
	5	— melanorhynchus,	..	Sykes, Dukkun.
	6	— schisticeps,	..	Bengal.
	7	— erythiocephalus,	..	China.

xxxxx. Subfam Psittaculina, Vigors.

GENUS PSITTACULA, KÜHL.

Additional species.	1	Psittaculina Galguila,	..	Java.
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III. FAM PICIDÆ.

GENUS BUCCO.

Additional species desirable?	1	Bucco Javensis,	..	Horsf. Java.
	2	— roseicollis,	..	id.
	3	— Philippensis,	..	
	4	— australis,	..	Horsf.
	5	— versicolor,	..	Raff. Sumatra.
	6	— de Mainas,	..	Temm. Sumatra.
	7	— Lathamii,	..	id.
	8	— caniceps,	..	Dukkun.
	9	— corvinus,	..	id.
	10	— grandis,	..	Sumatra.
	11	— cyanops,	..	Cuv. Assam.

GENUS PICUS.

A complete series of the Continental species of Picus desirable.	1	Picus leucogaster,	..	Temm. Java.
	2	— pulverulentus,	..	Temm. id.
	3	— dimideatus,	..	Temm. id.
	4	— Goensis,	..	Lath. id.
	5	— miniatus,	..	Gmel. id.
	6	— puniceus,	..	Horsf. id.
	7	— analis,	..	Temm. id.
	8	— poicilolophus,	..	Temm. id.
	9	— badius,	..	Raff. Sumatra.
	10	— Mahrattensis,	..	Lath. Dukkun.
	11	— nuchalis,	..	Wagler, Bengal.
	12	— squamatus,	..	Gould, Bengal.
	13	— hyperythrus,	..	Gould, Bengal.
	14	— brunifrons,	..	Gould, Bengal.
	15	— Himalayanus,	..	Jardin, Bengal.
	16	— strenuus,	..	Gould, Assam.
	17	— occipitalis,	..	Gould, Cent. id.
	18	— Nepalensis,	..	Gray and Hard. id.
	19	— Macei,	..	id.

Pedibus Tridactylis.

GENUS CHRYSNOTUS, SWAINS.

<i>Additional species?</i>	{	1 Picus Chrysonotus,	..	<i>Grant, Assam.</i>
		2 ——— tiga,	..	<i>Horsf. Java.</i>

GENUS YUNX, LINN.

1 Yunx torquilla,	..	<i>Linn. Assam, &c.</i>
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IV. FAM. CERTHIADÆ.

GENUS UPUPA, AUCT.

Upupa minor,	..	<i>Shaw, Dukhun.</i>
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GENUS TICHODROMA.

1 Tichodroma erythroptera,	..	<i>China.</i>
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GENUS SITTA, LINN.

<i>Other species of Sitta are recorded.</i>	1 Sitta frontalis,	..	<i>Horsf. Java.</i>
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V. FAM. CUCULIDÆ.

GENUS COCCYZUS, VIEILL.

<i>Desideratum.</i>		1 Coccyzus chrysogaster,	..	<i>Java.</i>
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GENUS LEPTOSOMUS.

1 Leptosomus Afer,	..	<i>Dukhun.</i>
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GENUS ENDYNAMIS, VIG. AND HORSF.

1 Endynamis orientalis,	..	<i>Java, &c.</i>
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GENUS CUCULUS, AUCT.

<i>All the Indian species.</i>	{	1 Cuculus fugax,	..	<i>Horsf. Java, &c.</i>
		2 ——— flavus,	..	<i>Gmel. id.</i>
		3 ——— canorus,	..	<i>id.</i>
		4 ——— Pravata,	..	<i>Linn. id.</i>
		5 ——— lugubris,	..	<i>Horsf. id.</i>
		6 ——— xanthorhynchus,	..	<i>Horsf. id.</i>
		7 ——— basalis,	..	<i>Horsf. id.</i>
		8 ——— Nepalensis,	..	<i>Gould, Bengal.</i>
		9 ——— Indicus,	..	

GENUS CENTROPUS, ILLIG.

<i>Centropus and Phænicophaus.</i>	{	1 Centropus lepidus,	..	<i>Horsf. Java, Assam.</i>
		2 ——— Philippensis,	..	<i>Cuv. id. id.</i>

GENUS PHÆNICOPHAUS, VIEILL.

1 Phænicophaus Rouverdin,	..	<i>Java.</i>
2 ——— lucidus,	..	<i>Vig. Sumatra.</i>
3 ——— tristis,	..	<i>Lesson, Assam.</i>

GENUS TROGON, LINN.

<i>Desideratum.</i>	{	1 Trogon Duvancelii,	..	<i>Temm. Sumatra.</i>
		2 ——— Hodgsonii,	..	<i>Gould, Assam.</i>

Tribus Tenuirostres, Cuv. Fam. Cinnnyridæ.

GENUS CINNYRIS, CUV. NECTARRINA ILLIG.

Indian species generally.	{	1	Cinnyris lepida,	..	Java, &c.
		2	———— pectoralis,	..	Horsf. Java.
		3	———— eximia,	..	Horsf. id.
		4	———— currucaria,	..	Linn. Dukhun.
		5	———— Vigorsii,	..	Sykes, id.
		6	———— minima,	..	Sykes, id.
		7	———— Mahrattensis,	..	Shaw, id.
		8	———— concolor,	..	Sykes, id.
		9	———— Peronii,	..	Siam.
		10	———— Assamensis,	..	M ^c Clelland, Assam.
		11	———— Labecula,	..	M ^c Clelland, id.

GENUS ARACHNOTHERA, TEMM.

Desiderata.		{	1	Arachnothera inornata,	..	Temm. Java.
			2	———— longirostria,	..	id.

GENUS DICŒUS, CUV.

Desiderata.		{	1	Dicœum cruentatum,	..	Java.
			2	———— erythronotum,	..	Assam.

FAM. MELIPHUGIDÆ.

GENUS CHLOROPSIS.

Desiderata.		{	2	Chloropsis Cochinchinensis,	..	Java, &c.
			2	———— chrysogaster,	..	M ^c Clelland, Assam.

GENUS POMATORHINUS, HORSF.

Desiderata.		{	1	Pomatorhinus montanus,	..	Horsf. Java, Assam.
			2	———— Horsfieldii,	..	Sykes, Dukhun.
			3	———— erythrogynus,	..	Gould, Bengal.

ORDO III.—RASORES, ILLIGER.

I Fam Columbidae.

GENUS VINAGO, CUV.

Additional species of Arachnotheri Dicœum Chloropsis and Pomatorhinus particularly desirable.	{	1	Vinago veruans,	..	Java, &c.
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GENUS PTILINOPUS, SWAINS.

1	Ptilinopus Elphinstonii,	..	Sykes, Dukhun.
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GENUS COLUMBA, LINN.

Species of Vinago, Ptilinopus and Columba are Desirable.	{	1	Columba alba,	Linn. }	Temm. Java.
			Columba titorulis, ..	}	
		2	———— melanocephala,	..	Gm. id.
		3	———— tigrina,	..	Temm. id.
		4	———— risoria,	..	Linn. id.
		5	———— Bantamensis,	..	Sparm. id.
		6	———— bitorquata,	..	Temm. id.
		7	———— Javanica,	..	Temm. id.
		8	———— Amboinensis,	..	Linn. id.
		9	———— ænea,	..	Linn. id.
		10	———— Jamboo,	..	Gmel. Sumatra.
		11	Aleena,	..	Sykes, Dukhun.
		12	humiles,	..	id.
		13	ænas,	..	id.
		14	cabaginus,	..	id.

II. FAM PHASIANIDÆ.

GENUS PAVO, LINN.

- | | | | |
|---|-----------------|----|---------------|
| 1 | Pavo cristatus, | .. | Linn. Dukkun. |
| 2 | — muticus, | .. | Temm. Java. |

GENUS POLYPLECTRON, TEMM.

- | | | | | | |
|---------------------|------|---|----------------------------|----|----------|
| <i>Desideratum.</i> | | 1 | Polyplectron bicalcaratus, | .. | Sumatra. |
|---------------------|------|---|----------------------------|----|----------|

GENUS LOPHOPHORUS, TEMM.

- | | | | |
|---|------------------------|----|---------|
| 1 | Lophophorus Impeyanus, | .. | Bengal. |
|---|------------------------|----|---------|

GENUS GALLUS, BRISS.

- | | | | | | |
|------------------------------|---|---|------------------|----|-------------|
| <i>Other Indian species?</i> | { | 1 | Gallus furcatus, | .. | Temm. Java. |
| | | 2 | — Bankiva, | .. | Temm. id. |
| | | 3 | — Soneratii, | .. | Dukkun. |
| | | 4 | — giganteus, | .. | id. |
| | | 5 | — domesticus, | .. | id. |

GENUS EUPLOCOMUS.

- | | | | | | | |
|-------------------|------|---|---|------------------------------|----|----------------|
| <i>Desiderat.</i> | | { | 1 | Euplocomus erythrophthalmus, | .. | Sumatra. |
| | | | 2 | — ignitus, | .. | Temm. Sumatra. |

GENUS PHASIANUS.

- | | | | | | |
|-------------------------------------|---|---|--------------------------|----|--------|
| <i>All the continental species.</i> | { | 1 | Phasianus albocristatus, | .. | China. |
| | | 2 | — leucomelanos, | .. | Assam. |
| | | 3 | — Pucrasia, | .. | China. |

GENUS ARGUS, TEMM.

- | | | | |
|---|------------------|----|----------------|
| 1 | Argus giganteus, | .. | Temm. Sumatra. |
|---|------------------|----|----------------|

GENUS TRAGOPAN, CUV.

- | | | | | | |
|----------------------------|----|---|--------------------|----|---------|
| <i>Additional species.</i> | .. | 1 | Tragopan cornutus, | .. | Bengal. |
|----------------------------|----|---|--------------------|----|---------|

GENUS NUMIDA.

- | | | | |
|---|-------------------|----|---------------------|
| 1 | Numida Meleagris, | .. | Domestic in Dukkun. |
|---|-------------------|----|---------------------|

III. FAM TETRAONIDÆ.

GENUS CRYPTONYX.

- | | | | |
|---|----------------------|----|----------|
| 1 | Cryptonyx cristatus, | .. | Sumatra. |
| 2 | — ocellatus, | .. | id. |

GENUS COTURNIX, CUV.

- | | | | | | |
|---|---|---|--------------------|----|----------------|
| <i>A complete series of the Genera of this family desirable,</i> | { | 1 | Coturnix sinensis, | .. | Java. |
| | | 2 | — dactylisonans, | .. | Dukkun. |
| | | 3 | — textilis, | .. | id. |
| | | 4 | — Argoondah, | .. | Sykes, Dukkun. |
| | | 5 | — Pentah, | .. | Sykes, id. |
| | | 6 | — erythrorhyncha, | .. | Sykes, id. |

GENUS PERDIX, BRISS.

- | | | | |
|---|------------------|----|-------------------------|
| 1 | Perdix Javanica, | .. | Horsf. Java. |
| 2 | — personata, | .. | Horsf. id. |
| 3 | — curvirostris, | .. | Sumatra. |
| 4 | — picta, | .. | Jard and Selby, Dukkun. |
| 5 | — oculate, | .. | |
| 6 | — Chukur, | .. | Bengal. |

GENUS FRANCOLINUS.

1	Francolinus spadiceus,	..	Dukhun.
2	———— Pontecerianus,	..	id.
3	———— cruentus,	..	Bengal.
4			

GENUS PTEROCLES.

1	Pterocles quadricinctus,	..	Temm. Dukhun.
2	———— exustus,	..	Temm. Dukhun.

GENUS HEMIPODIUS, TEMM.

1	Hemipodius Luzoniensis,	..	Java.
2	———— pugnax,	..	Dukhun.
3	———— Dussumier,	..	Temm. id.
4	———— Taigoor,	..	Sykes, id.

IV. FAM STRUTHIOMDÆ.

GENUS OTIS, LINN.

Desideratum.	 {	1	Otis nigriceps,	..	Gould, Dukhun.
		2	—— fulva,	..	Sykes, id.

ORDO IV. GRALLATORES.

I. Fam Gruidæ.

GENUS GRUS, PALLAS.

1	Grus cinerea,	..	..	Bengal.
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II. FAM ARDEIDÆ.

GENUS ARDEA.

Good specimens of the Genera Grus, Ardea and Ciconia desired.	1	Ardea cinerea,	..	Linn. var. Java.
	2	—— purpurea,	..	Linn. id.
	3	—— Egretta,	..	Gmel. Java, Dukhun.
	4	—— Garzetta,	..	Linn. id. id.
	5	—— russata,	..	Temm. Java.
	6	—— Malaccensis,	..	Gmel. id.
	7	—— speciosa,	..	Horst. id.
	8	—— Sinensis,	..	id.
	9	—— flavicollis,	..	Lath. id.
	10	—— Javanica,	..	id.
	11	—— cinnamomea,	..	Gmel. id.
	12	—— Caboga,	..	Penn. Dukhun.
	13	—— Grayii,	..	Sykes, id.
	14	—— gularis,	..	Siam.

GENUS BOTAURUS, BRISS.

1	Botaurus stellaris,	..	Bengal.
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GENUS NYCTICORAX, STEPHENS.

1	Nycticorax Europæus,	..	Java, Dukhun.
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GENUS CICONIA.

Ciconia Argala (Adjutant),	1	Ciconia capillata,	..	Temm. Java.
a good specimen desired!	2	—— lencoccephala,	..	Java.

GENUS PHÆNICOPTERUS.

- 1 Phænicopterus ruber, .. Linn. Siam.

GENUS MYCTERIA, LINN.

- 1 Mycteria australis, .. Bengal.

GENUS PLATALEA, LINN.

- 1 Platalea leucorodia, .. Linn. Dukkun.

GENUS ANASTORNUS, ILLIGER.

- 1 Anastornus typus, .. Linn. Dukkun.

GENUS TANTALUS, LINN.

- 1 Tantalus leucocephalus, .. Lath. Dukkun.

GENUS IBIS, LACEP.

- 1 Ibis religiosa, .. Cuv. Dukkun.
 2 — ignea, .. id.
 3 — papillosa, .. Temm. id.
 4 — falcinella, .. Temm. id.

III. FAM SCOLOPACIDÆ.

GENUS NUMENIUS, BRISS.

- Desiderata.* 1 Numenius Phœœpus, .. Java.

GENUS TOTANUS, BECHSTEIN.

- A series of this Genus.* { 1 Totanus affinis, .. Horsf. Java.
 2 — hypoleucos, .. Temm. id.
 3 — acuminatus, .. Horsf. id.
 4 — tenurostris, .. Horsf. id.
 5 — Damacensis, .. Horsf. id.
 6 — Glottis, .. Beckst. id.
 7 — ochropus, .. Temm. Dukkun.
 8 — Glareola, .. Temm. id.

GENUS LIMOSA, BRISS.

- Desiderata.* { 1 Limosa melanura, .. Java.
 2 — Terek, .. Temm. id.
 3 — Horsfieldii, .. Sykes, Dukkun.
 4 — Glottoides, } Sykes, id.
 Totanus Glottoides, } Gould.

GENUS SCOLOPAX, LINN.

- 1 Scolopax saturata, .. Horsf. Java.

GENUS GALLINAGO, RAY.

- Other Indian species of Scolopax and Gallinago.* { 1 Gallinago media, .. Java, Dukkun.
 2 — minima, .. Dukkun.

GENUS RHYNCHÆA, CUV.

- Desideratum.* { 1 Rhynchæa orientalis, .. Horsf. Java.
 2 — pieta, .. Gray, Dukkun.

GENUS PELIDNA, CUV.

- Desideratum.* 1 Pelidna Temminckii, .. Stephens, Dukkun.

GENUS TRINGA, LINN.

- Desideratum.* 1 Tringa subarquata, .. Temm. Java.

GENUS STREPSILAS, ILLIGER.

- Desideratum.* 1 *Strepsila collaris*, .. *Temm. Sumatra.*

IV. FAM RALLIDÆ.

GENUS PARRA, LINN.

- 1 *Parra superciliosa*, .. *Horsf. Java.*
2 — *Sinensis*, .. *Gmel. Dukkun.*

GENUS GLAREOLA, BRISS.

- Other Continental species.* { 1 *Glareola orientalis*, .. *Leach, Java.*

GENUS RALLUS, LINN.

- Desideratum.* { 1 *Rallus gularis*, .. *Horsf. Java.*
2 — *fucous*, .. *Linn. id.*
3 — *A kool*, .. *Sykes, Dukkun.*

GENUS GALLINULA, BRISS.

- Continental species.* { 1 *Gallinula lugubris*, .. *Horsf. Java.*
2 — *chloropus*, .. *id.*
3 — *Javanica*, .. *Horsf. Java, Dukkun.*
4 — *superciliosa*, .. *Temm. Java.*

GENUS PORPHYRIO, BRISS.

- 1 *Porphyrio smaragdinus*, .. *Java, Dukkun.*

GENUS FULICA.

- 1 *Fulica atra*, .. *Linn. Java, Dukkun.*

V. FAM CHARADRIADÆ.

GENUS VANELLUS, BRISS.

- Desiderata.* { 1 *Vanellus melanogaster*, .. *Java.*
2 — *tricolor*, .. *Horsf. id.*
3 — *Goënsis*, .. *Steph. Dukkun.*
4 — *bilobus*, .. *id.*

GENUS CHARADRIUS.

- Indian species generally.* { 1 *Charadrius cantarius*, .. *Lath. Java.*
2 — *pluvialis*, .. *Linn. id.*
3 — *Asiaticus*, .. *Gmel. id.*
4 — *pusillus*, .. *Horsf. id.*
5 — *Phillippensis*, .. *Lath. Dukkun.*

GENUS CURSORIUS, LATH.

- 1 *Cursorius Asiaticus*, .. *Lath. Dukkun.*

GENUS HIMANTOPUS, RAY.

- 1 *Himantopus melanopterus*, .. *Java, &c.*

GENUS ÆDICNEMUS, CUV.

- 1 *Ædicnemus crepitans*, .. *Dukkun.*

ORDO V. NATATOIRES.

I Fam Anatidæ, Leach.

GENUS PLECTROPTERUS, LEACH.

- 1 *Plectropterus melanotos*, .. *Dukkun.*

GENUS ANSER, BRISS.

- 1 *Anser Gitta*, .. *Dukkun.*

A series of Indian Natatores generally desirable.

GENUS TADORNA, LEACH.

- 1 Tadorna rutila, .. *Steph. Dukhun.*

GENUS ANAS, AUCT.

- 1 Anas strepera, .. *Linn. Dukhun.*

GENUS RHYNCHAPSIS.

- 1 Rhynchapsis viresceus, .. *Dukhun.*

GENUS MARECA.

- 1 Mareca pæcilorhyncha, .. *Steph. Dukhun.*

- 2 ——— fistularis, .. *id.*

- 3 ——— Ardsuro, .. *Sykes, id.*

- 4 ——— Arcuata, .. *Cuv. Java.*

GENUS QUERQUEDULA.

- 1 Querquedula Circia, .. *Dukhun.*

GENUS MERGUS, LINN.

- 1 Mergus Merganser, .. *Bengal*

II. FAM. COLYMBIDÆ.

GENUS PODICEPS, LATH.

- 1 Podiceps minor, .. *Java.*

- 2 ——— Philippensis, .. *Dukhun.*

III. FAM. ALCADÆ.

GENUS APTENODYTES, FORST.

- 1 Aptenodytes, .. *Southern Ocean.*

IV. FAM. PELECANIDÆ—LEACH.

GENUS PELECANUS.

- 1 Pelecanus onocrotalus, .. *Java.*

- 2 ——— Javanicus, .. *Horsf. id.*

GENUS PHALACROCORAX, BRISS.

- 1 Phalacrocorax Javanicus, .. *Java.*

GENUS SULA, BRISS.

- 1 Sula communis. .. *Siam.*

GENUS TACHYPETES, VIEILL.

- 1 Tachypetes Aquilus, .. *Siam.*

GENUS PHAETON, LINN.

- 1 Phaëton æthereus,

GENUS PLOTUS, LINN.

- 1 Plotus melanogaster, *Gml. Java, Dukhun.*

V. LARIDÆ—LEACH.

GENUS STERNA, LINN.

- 1 Sterna minuta, .. *Linn. Java.*

- 2 ——— Javanica, .. *Horsf. id.*

3	<i>Sterna media</i> ,	..	<i>Horsf. id.</i>
4	—— <i>grisea</i> ,	..	<i>Horsf. id.</i>
5	—— <i>affinis</i> ,	..	<i>Horsf. id.</i>
6	—— <i>acuticauda</i> ,	..	<i>Gray, Dukhun.</i>
7	—— <i>similis</i> ,	..	<i>Gray, Dukhun.</i>
8	—— <i>Seena ?</i>	..	<i>Sykes, Dukhun.</i>

GENUS DIOMEDEA, LINN.

- 1 *Diomedea exulans*.
- 2 ——— *fuliginosa*.

GENUS PROCELLARIA, AUCT.

- 1 *Procellaria Capensis*,
- 1 ——— *æquinoctialis*.

Remarks.

In the preceding list, subjects of which specimens are particularly desirable have been indicated in the margin: of these several specimens will be useful. The more common species have also been indicated, and of these a single specimen, in good condition, especially in an extensive series or to complete a *local Fanna*, will be sufficient. The Court's wishes respecting collections for the Company's Museum have been generally expressed in the public letter; a few explanatory remarks are now added. The list exhibits a general view of the present contents of the Company's Museum in Mammalia and Birds, and its chief object is to direct Naturalists in India to the discovery of new species, and to the supply of such as are still wanting in the Museum. Respecting Mammalia generally, it may be observed that specimens of all the smaller species in good condition will be desirable; but the Court particularly recommend a very close and persevering search respecting the family of *Chiroptera* or *Bats*. The list contains only a small number of Indian Bats, and the Court are most anxious to obtain a large addition of subjects of this family to complete that series. Very few of the Bats of Continental India have as yet been collected, and a general, careful, zealous search is strongly requested and recommended.

Of the family of *Quadrumanæ*, a general supply of good specimens will also be desirable, especially of the Genera *Hylobates*, *Semnopithecus*, *Macacus*; also of the allied Genera *Lemur*, *Tarsius*, and *Galeopithecus*. Among the *Feræ* the smaller species of *Felis*, *Mustela*, *Mangusta*, *Viverra*, *Arctitis* (or *Ictides*), *Canis*, *Ailurus*, *Arctonyx*, &c. are requested; and of the larger species good specimens only of rare or newly discovered subjects. These remarks also apply to the order of the *Ungulata*, and among these, especially to the Genera *Antilope*, *Moschus*, *Cervus*, &c. Of the order of *Glires* or *Rodentia*, which are generally small, the Court will be glad to receive series as complete as possible of the species of all the genera, namely, *Sciurus*, *Pteromys*, *Lepus*, *Mus*, &c. &c.

Respecting Birds, the Court would direct particular attention to those Genera which are marked in this list. Several of these have only recently been discovered, and they are of great value and interest in science: additional specimens will be very welcome, and also new species of these, or of previously known Genera.

The Officiating Curator having been requested to furnish his Report on the foregoing papers, submitted the following :—

H. W. TORRENS, Esq.

Secretary, Asiatic Society.

SIR,

In obedience to the desire of the Committee of Papers, confirmed by the Society at its meeting of the 5th instant, I have the honour to submit my report on the matters relative to the Museum, forming the subject of the letter of the Honorable the Court of Directors, No. 17 of 1840, under date 16th September, 1840, and that of the Society to the Government of India, General Department, transmitting the former to you, date 31st December 1840. For more distinct explanation, it may be convenient to state what these matters are :—

I.—The relation in which the Society now stands towards the Honorable the Court.

II.—Inquiry for various collections assumed to have been detained at the Society's rooms : especially those of Dr. HELPER and Capt. PEMBERTON.

III.—The assistance which may be afforded by the Society to facilitate the early dispatch of collections made by Government Officers.

IV.—Assistance which may be afforded by the Society towards the completion of the Honorable Court's Museum.

The feeling of the Society, and my own views on this head, are, I submit,

I. The relation in which the Society now stands towards the Honorable the Court.	} fully expressed by the Resolution which I had the honor to propose, and which was unanimously carried at the January meeting of 1841, (see Journal No. 105, p. 943,) and which for ready reference, I copy here.

"The Officiating Curator reported, that a considerable number of duplicate specimens, principally of birds, &c. were available for transmission to Europe; and he moved,—that as many specimens of great interest to Naturalists might be collected, prepared and sent to England at a small expence, it was worthy the attention of the Society, whether such might not be prepared and sent to the Honorable the Court of Directors, as due to them from the Society."

The Society therein adopting this resolution, has fully testified its earnest desire to acknowledge, in every possible way which can tend to the general advancement of science, the liberal assistance which the Honorable the Court has been pleased to extend to it. I may also here, perhaps, refer to my report for the past month, (approved by the Society), in which, after proposing a second dispatch of duplicates to the Honorable the Court, I have ventured further to suggest to their Curator, how we can mutually assist each other, as follows :—

"I may suggest here, that we point out to the Curator of the Museum of the Honorable the Court of Directors the great facility with which, if approved of by the Court, he might procure in exchange for such specimens as he already possesses, some of the many which we require for the Museum of Economic Geology. It is scarcely possible to send home a skin of a bird, a skeleton, or a skull from India, for which some duplicate may not be obtained in exchange, which would be of utility to us here."

II.—Inquiry for various collections supposed to have been detained at the Society's Rooms, especially those of Dr. HELPER and Capt. PEMBERTON.

My report on Dr. HELPER's collection will I trust have satisfactorily shewn that, with respect to them, the Society is exonerated from all blame. I omitted in it to refer to the Entomological part. On careful inquiry, I find that no collection of insects was, at any time, deposited at the Society's Rooms by Dr. HELPER. Specimens of the moth cocoon, &c. of the Assam silk worms, were only presented by him to illustrate his paper on that subject.

With reference to Capt. PEMBERTON's collection, you will not fail to remark, that the collections referred to in those passages of the proceedings quoted in the Honourable the Court's letter, are collections placed "*in deposit*" only, and consequently, I shall infer, held by the Society at the disposition of the depositor, who evidently by his letter, at p. 749 of the Journal, is there disposing of them; since he says, that "under instructions from Government he presents to the Society 145 specimens of birds, a selection from the Bootan collection, &c."

Further: The collections deposited by Captain PEMBERTON were packed at the Museum, and in February 1840 sent to the Marine Board, for shipment to England, in four cases. Upon reference to Mr. GREENLAW, who has kindly referred to the agents of the *Shepherdess*, the vessel on which the cases were shipped, I learn that she did not arrive in England till the month of December; the Honourable Court's letter, it will be observed, bears date the 16th September 1840.

This is what I have been able to ascertain from the assistants and taxidermists at the Museum, and from Capt. PEMBERTON's official letter; in addition to which I may state, that from the description of the assistants, the four cases were about equal to half or three-quarters of a ton of measurement. Mr. GREENLAW has no knowledge of their size, as freight was to be paid at home.

I have referred to Dr. McCLELLAND, who has furnished me with Mr. GREENLAW's receipt, but he has not replied to my official letter, of which copy is hereto annexed. He however informs me in a private note as follows:—

"The duplicates only, as far as I recollect of the Bootan collection, were sent to the Court of Directors. A complete series was kept with the Society, particularly of the insects; the rest I forwarded myself through the Government on the part of the Bootan deputation."

There is some discrepancy here, which I cannot reconcile with Capt. PEMBERTON's letter quoted above; but as my knowledge stops at this point, I must leave it for your consideration.

Of the insects, there are none in the Society's collection noted as from the Bootan deputation. The assistants state, that they have no recollection of any collection having been received at the Museum for the Society as from Capt. PEMBERTON, or from the Bootan deputation; nor can I find any in their book, which however, is not very carefully kept. The insects referred to by Dr. McCLELLAND, may possibly be those which have no donor's names annexed to them in our cases. On my assuming charge of the Museum, I found a tin box of insects in the taxidermists' room, of which they were taking great care, and their account of it was, that Capt. PEMBERTON had brought *two* such boxes to the Museum; one of which they packed, and *he* himself sent it away, for the Court

of Directors; leaving the other under their care as his private property. This box has recently (February) been sent, under your directions, to Mrs. PEMBERTON.

My report of February also mentions, that in that month I had received from Col. MACLEOD two boxes, being Geological Specimens collected by Capt. PEMBERTON on his Bootan Mission; but without any catalogue. On these you will doubtless take the orders of Government. Dr. McCLELLAND in his note mentions the collections of the Assam Deputation. On reference to Dr. WALLICH, he informs me that he has reported on this subject to Government.

My report of February last also states, what had been found to be the sad condition of the three cases forwarded from Umballa by Mr. CLARK, and just received at the Museum, where I had recognised the collection as being that made by Sir ALEXANDER BURNES during his mission to Scinde. You will doubtless take the orders of Government on this collection also. The Society is thus, I trust completely acquitted of any negligence or detention of any collection which has come into its hands of late years.

III.—The assistance which may be afforded by the Society to facilitate the early despatch of collections made by Government Officers.

It appears from the foregoing statements, that the Society, in the case of Dr. HELFER's and Capt. PEMBERTON's collections have, really in every respect forestalled the wishes of the Honourable Court, by assisting as far as possible in the early dispatch of them. It is unnecessary here to refer again to its resolution, as already quoted at par. 2, when speaking of the relations in which it stands towards the Honourable the Court.

IV.—The assistance which may be afforded by the Society towards the completion of the Court's Museum.

In reference to this matter, the Society has also done itself the honour to forestall in some respect the views of the Right Honourable the Governor General in Council, by its resolution and by our first dispatch of duplicates of birds and snakes, and of Lieut. HUTTON's valuable Geological series from the Himalaya and Spiti Valley. If desired, it might employ a few taxidermists at the expence of Government, who could be sent at a small expence with gentlemen desirous of contributing to the knowledge of Indian Natural History, and under zealous amateurs, many of whom are now deterred by their want of knowledge, or want of time, or the expence, much might doubtless be done.

I may be excused in remarking in conclusion that it is clear that, in relation to the Natural Sciences, as in every thing else, if India had all that she requires from Europe, and Europe all that she wants from India, both must be immeasurably benefited. In nothing then, surely, can a scientific body like the Asiatic Society, be more honourably employed than in promoting even the smallest fraction of such an exchange; and in nothing could it, in its sphere, more effectually confer lasting benefit on India.

I have the honour to be,

Sir,

Your's obediently,

H. PIDDINGTON,

Acting Curator, As. Soc. Museum.

CALCUTTA,
Asiatic Society's Rooms,
18th March, 1841.

Copy of a Letter to Dr. McCLELLAND referred to in the foregoing Report.

DEAR SIR,

A dispatch having been received by the Government of India from the Honourable the Court of Directors, in which, referring to Proceedings of the Asiatic Society for February, September, October, and November, 1838, they state, that it would appear that collections of Natural History have been detained at the Society's Rooms since those epochs, I have been desired to furnish a report thereon.

2. They refer more particularly to Dr. HELPER's and Captain PEMBERTON's collections. Of the first of these, (Dr. HELPER's,) I have been able to render a full account, quite exonerating the Society or its officers from any blame.

3. Of the second: we have in the Proceedings reference to three collections, mostly birds, deposited by Capt. PEMBERTON, and at p. 749, (Journal 1838,) that 145 birds were presented by him "under instructions from Government." It appears, moreover, by the books, that on the 29th February 1840, four cases which the Messrs. BOUCHEZ state to have been packed and marked here for the Honourable the Court, were sent to the Marine Board for shipment, but they have no receipt for them.

4. I am therefore desired to request from you, on the part of the Society, the best information you can afford us as to these, or any other Government collections of Natural History, which may have been received or sent out while you were in charge of the Society's Museum; with any documents or receipts which may enable us to explain to the full satisfaction of Government, what has become of them.

I am Sir, &c.

H. PIDDINGTON,

CALCUTTA,
As. Socy. Rooms, 12th March, 1841.

Actg. Curator, As. Socy. Museum.

No. 806.

TO DR. J. McCLELLAND,

Curator, Asiatic Society's Museum.

SIR,

With reference to your letter dated 29th ultimo, I am directed by the Marine Board to inform you of the shipment on the *Shepherdess*, Capt. BIGGAR, of the 4 boxes containing Natural Curiosities for England, to the address of the Honourable the Court of Directors, at the rate of £ 5-5 per ton of 50 cubic feet; freight payable in England on due delivery of the boxes.

I have the honor to be,

Sir,

Fort William,
MARINE BOARD OFFICE,
The 5th March, 1840.

Your most obedient Servant,

C. B. GREENLAW,
Secretary.

Resolved—That Mr. PIDDINGTON's report be forwarded to the Government, and that attention be particularly directed to the three points suggested in paragraphs 10, 11, and 13, by the Officiating Curator for the consideration of Government, and more particularly for the employment of taxidermists at its expence to accompany gentlemen desirous of contributing to the knowledge of Indian Natural History, but now deterred from doing so, for want of knowledge, or want of time, or the expence.

Read the following letter of 24th March last from Mr. Secretary BUSHBY :—

No. 433.

'To H. TORRENS, Esq.

'Secretary to the Asiatic Society.

'General Department.

'Sir,

'I am directed to acknowledge the receipt of your letter and its enclosure of the 8th instant, and to acquaint you for the information of the Asiatic Society, that the Report of the Officiating Curator of the Society's Museum on the Specimens brought out by Capt. TREMENEHERR, and deposited with the Society for the basis of a Museum of Economic Geology, will be transmitted to the Hon'ble the Court of Directors by the next Overland Mail.

'2d. I am desired to take this opportunity for forwarding to the Asiatic Society the accompanying three specimens of rock from the head of the Pass at the Gurrah Ghât, near Mhow, on the Bombay and Agra road, together with a copy of the letter from Captain J. H. SMYTH, Officiating Superintendent of the Road, transmitting the specimens to the Military Board.

'3d. In respect to the Society's Museum of Economic Geology, the contributions will be obtained gradually by such aids as the Hon'ble the Court of Directors may be enabled to procure, or be pleased to sanction, and by the assistance of private individuals interested in this department of practical science, and by donation or interchanges with other Societies.

'4th. The influence and correspondence of the Asiatic Society will progressively accomplish these objects.

'5th. The Military Board will be instructed to direct the attention of the executive Officers of public works and roads, to the purposes of the institution of a Museum of Economic Geology, and to cause collections to be made of specimens, and descriptive lists to be sent to them, from which in communication with the Curator of the Society, the valuable and useful parts will be selected for transmission to the Museum at the least possible expence, and in most cases it is hoped, by a proper arrangement, without any charge in excess of the ordinary carriage that would be employed for other public uses.

'FORT WILLIAM,
'24th March, 1841.

'I have the honor to be,
'Sir,
'Your most obedient Servant,
'G. A. BUSHBY,
'Secretary to the Government of Bengal.

'No. 143.

'To MAJOR DE BUDE,

'Secretary to the Military Board, Fort William.

'SIR,

'You will receive by Dak banghy, three specimens of the soil at the head of the Pass at Ghurra Ghat, forwarded to me by Captain KELLNER, superintending the road from

Dewass to Ackberpore. No. 1 abounds in detached masses eight feet below the surface; No. 2 in blocks four to six feet in diameter at the surface, and bedded two to three feet in No. 3, which latter is the prevailing stone at the pass, as far as the excavation has as yet been carried.

‘I have &c.

(Signed) ‘J. W. SMYTH, Captain,
Offg. Supt. of the Agra and Bombay Road.
(True Copy,)

(Signed) ‘M. MACLEOD, Captain,
‘Assist. Offg. Secy. Military Board.

(True Copy.)

(Signed) ‘G. A. BUSHBY,
‘Secretary to the Government of Bengal.’

‘SEEPREE }
‘16th February, 1841. }

With reference to the three specimens of rock received with the foregoing letter, read the following report from the Officiating Curator of 5th April, 1841, a copy of which was communicated to the Government through Mr. Secretary BUSHBY :—

‘H. W. TORRENS, Esq.

‘Secretary, Asiatic Society.

‘Sir,

‘I have to acknowledge receipt of the three specimens of Stone forwarded by Capt. KELLNER, through the Military Board, from the Pass at Ghurra Ghaut, and to say that they are

‘• No. 1. Hornblende Slate (or Basaltic Hornblende.)

‘No. 2. Argillaceous Sandstone, with veins of mica, having a metallic appearance.

‘No. 3. Felspar Prophry.

‘I beg to suggest, that if a good series of specimens through the whole line of road, with a plan and elevation, and as many barometrical elevations of the heights of passes, &c. as possible, could be procured, it would be a great addition to our geological knowledge; as we have but very few sections crossing from the NNE. to the SSW. from the valley of the Ganges towards that of the Nurbudda.

‘I further suggest, that a copy of Capt. TREMENEER’s Memoir be sent to Capt. KELLNER, and indeed to all officers in charge of road-making duties. The specimens are for the present placed in the Museum of Economic Geology.

‘MUSEUM,

‘5th April, 1841.

‘I am, Sir,

‘Your obedient servant,

‘H. PIDDINGTON,

‘Offg. Curator, As. Soc. Museum.

With reference to the 3rd paragraph of Mr. BUSHBY’s letter, a question having been suggested as to the proprietorship of the Museum of Economic Geology, the Meeting were of opinion, that as it was not likely that the Government would ever recall it, that the Asiatic Society be considered virtually the proprietor.

* Specimen too small to determine to which variety belonging.

Read the following letter, No. 822, from Mr. Secretary MADDOCK :—

To H. TORRENS, Esq.

No. 822.

Secretary to the Asiatic Society.

Political Department.

SIR,

I am directed by the Governor General in Council to forward to you the accompanying copy of a calculation by Lieut. BIGGS, of the heights of the principal villages visited by him in the Naga Hills, for such notice as the Society may deem it to merit.

I have the honor to be,

FORT WILLIAM,
29th March, 1841.

Sir,
Your most obedient servant,
T. H. MADDOCK,
Secy. to the Govt. of India.

No. 11.

To Captain JENKINS,

Agent to the Gov. Gen. N. E. Frontier.

SIR,

Having by the Dak of yesterday received the Tables necessary to enable me to calculate the approximate height of the various points, which have been taken by Thermometrical observations, I have the honor to forward the same, and am happy to find that they prove nearly correct, when compared with those of yourself and Captain PEMBERTON.

1st. Observation, camp Semoor river below the Prephamah, 2nd February, 1841.

Thermo. in the shade, 48°.

Water boils, 208, approx. height 2,116 feet.

2nd February.

2nd. Observ. at wells on S. E. of village of Prephamah.

Thermo. in shade, 56°.

Water boils, 206, approx. height 3,335 feet.

2nd February.

3rd. Observ. at village of Geroophamah.

Thermo. in shade, 56½°.

Water boils, 204, approx. height 4,340 feet.

3rd February.

1st. Observation at village of Sassamah.

Thermo. in shade, 59°.

Water boils, 204, approx. height 4,362 feet.

4th February, 1841.

1st. Observation camp opposite Ronomah in valley.

Thermo. in shade,..... $48\frac{1}{2}^{\circ}$.Water boils, 205 , approx. height $3,729$ feet.

5th February, 1841.

1st. Observation top of the pass to the Jolah river.

Thermo. in shade below the } $46\frac{1}{2}^{\circ}$.
pass on W. side,..... }Ditto, Ditto, at top, $58\frac{1}{2}^{\circ}$.Water boils, 201 , approx. height $5,989$ feet.

5th February.

2nd. Observation camp on Jalla river.

Thermo. in shade,..... 46° .Water boils, 203 , approx. height $4,729$ feet.

6th February.

1st. Observation at pass of Ronomah or Paplongurge.

Thermo. in shade, 56° .Water boils, $201\frac{1}{2}$, approx. height $5,733$ feet.

2nd. Observation camp below village.

Thermo. in shade,..... 50° .Water boils, 204 , approx. height $4,283$ feet.

7th February.

1st. Observation summit of pass over great range.

Thermo. in shade,..... $47\frac{1}{2}^{\circ}$.Water boils, $201\frac{1}{2}$, approx. height $5,615$ feet.

2nd. Observation camp below the pass, N. side.

Thermo. in shade,..... 56° .Water boils, $205\frac{1}{2}$, approx. height $3,513$ feet.

3rd. Observation village of Jyramah.

Thermo. in shade,..... $68\frac{1}{2}^{\circ}$.Water boils, 209 , approx. height $1,650$ feet.

8th February.

1st. Observation below cane bridge over Kooki river.

Thermo. in shade,..... $58\frac{1}{2}^{\circ}$.Water boils, 211 , approx. height 536 feet.

2nd. Observation summit of Sumigooding.

Thermo. at bottom in shade, $58\frac{1}{2}^{\circ}$.Ditto to top, .. ditto, $70\frac{1}{2}^{\circ}$.Water boils, $207\frac{1}{2}$, approx. height $1,911$ feet.

From the last observation it will be seen, as I have not the report of Captain PEMBERTON at hand to refer to the others from, that by my calculations the top of

the village of Sumigooding, stated by that officer from Barometrical observation, to be 196 feet above the level of the sea, is made 49 feet less, a very trifling difference, and one on that account highly satisfactory to me, for the correctness of the others as well as of the instrument, and I hope the same may prove equally so to yourself and Government.

I have, &c. &c.

CAMP SUMEGOODING,
13th February, 1841.

(Signed)

T. BIGGE,
Amt. Agent Gov. Gen.

(True copy,)

(Signed)

F. JENKINS,
Gov. Gen. Agent.

(True copy)

(Signed)

T. H. MADDOCK,
Secy. to Govt. of India.

The Secretary submitted to the inspection of the Meeting several drawings of fishes of the Indus, of the late Dr. LORD's collection.

The Secretary submitted a Sindo Vocabulary by Lieut. EASTWICK. Ordered to be referred to the Committee of Papers.

Dr. H. H. SPRY submitted in the name and on behalf of Capt. JENKINS, Commissioner in Assam, a series of Geological and Mineralogical specimens illustrative of the Grognotic features of the county of Cornwall, with the following note to the Secretary :—

"This collection, extensive as it is, is only a part of what Capt. JENKINS designs for the Museum; and it has occurred to him, as well as to myself, that the contribution now made will not be an unacceptable accession to the Museum of Economic Geology, so lately formed through the exertions of Capt. TREMENER."

Read a letter from Lieut. A. CUNNINGHAM, of Engineers, of 25th March 1841, offering for purchase to add to the cabinet of coins of the Asiatic Society of Bengal sixty-five Roman coins and fifteen Greek coins, sent from the Mediterranean, for Rupees 50.

Lieut. CUNNINGHAM writes, "amongst the Greek coins are two of Melite, the other being Carthaginian and Greek-Egyptian coins of the Ptolemies. The Roman coins, are of all ages; several of them being coins of princes of whom the Society's cabinet possesses no specimens, such as Decentius, Lucilla, Faustina, Constantine, with the wolf suckling Romulus and Remus, &c. &c." Lieut. CUNNINGHAM also offered a series of the Kashmeer coins, twelve coins of twelve Rajahs for 12 rupees, and to collect some few other series of coins which would be interesting and useful.

It was resolved to purchase the coins from Lieut. CUNNINGHAM, and to avail of his services for the collection of other series, the thanks of the Society at the same time being voted to that Officer.

Read a letter from Capt. A. TROYER of Paris, of 15th October 1840, from which the following are extracts :—

“ Whatever the future result of operations in Syria may be, they have prevented the Asiatic Society of Paris to dispatch to Calcutta a box full of Books, among which is the Sanscrit text, and my French translation of the first 6 books of the *Rajatarangini*.

“ We have not yet received the number of your Journal which contains the account of the most interesting discovery you have made on a gem from the Frontier of Seistan, at the ancient Boonaka. It tends greatly to prove the great antiquity of Buddhism, which antiquity seems to gain from day to day.

“ I am now about to complete the English translation of the whole *DABISTAN*, which the late Capt. SHEE had begun, but left unfinished. I intend to have the work printed in Paris for the Translation Fund Committee of London, and hope to have the pleasure of sending you a copy in about a year.

Read Dr. SPRY's note on his tour to the Eastward.

Read letter from Capt. R. SHORTREEDE of 22nd March 1841, with a perpetual Time Table constructed by him, by “ the help of which,” says the author, “ may be found in less than half a minute the week, or day of any date for thousands of years, past or future.”

Read a letter from Lieut. POSTANS, dated 21st March 1841 ; containing his report on a certain branch of the Trade of Shikarpore.

Read a letter from Capt. HART of 15th March 1841, containing an account by him of the Brahmoes.

It was communicated to the meeting by the Secretary, that the foregoing four papers would be published in early numbers of the Journal by him.

Read a letter from Mr. KINNEY of Bonn, who has been selected by Professor LASSEN to act as Agent for the Society, containing among other matter, the offer of his services in the disposal of the Society's Oriental Publications.

Dr. HÆBERLIN was of opinion, that before dispatching the books for sale to Bonn their prices should be reduced, as without such reduction, he was of opinion that it would be useless to send the works, as the Oriental Scholars of Germany would not purchase at prices which he considered to be exorbitant. On this proposal Dr. HÆBERLIN was requested to submit a list of the Publications he would suggest to be sent to Bonn for sale, with a scale of reduction in their prices he would recommend, for the consideration of the Committee of Papers.

On the motion also of Dr. HÆBERLIN, in consequence of the death of Professor FRANK, who was an Honorary Member of the Asiatic Society of Bengal, that that compliment be paid to Professor EWALD, of Hanover, one of the best Orientalists in Germany. It was resolved—That the Doctor submit, formally, a proposition to this effect, likewise for the consideration of the Committee of Papers.

The Secretary submitted a Dogerotype, presented by Dr. ROUTH, for which, as well as for all other presentations and contributions in Books, Natural subjects, &c. the thanks of the Society were accorded.

K

On the Mines and Mineral Resources of Northern Afghanistan. By Capt. DRUMMOND, 3rd Light Cavalry, communicated from the Political Department, Government of India.

[Copper Mining district in the Ghilzie territory, South East of Cabool.]

From the valley of Dobundee, which communicates with the plain of Lagur in the direction of Koorrum, to the district of Moosge, about 14 miles south east of Cabool, and again from Moosge to Derbund and Rojan in the direction of Feseen, is an elevated and rugged mountain tract highly metalliferous.

Geology of the District.—The formations of this mineral district are composed principally of Hornblende rock, and Hornblende Gneiss, Primary Limestone, and Mica Slate. The hornblende rocks are generally speaking of a fissile character, the limestones again are hard, compact, occasionally slaty, and from their feeble effervescence when tried with nitric acid, seem to contain a portion of magnesia, and may accordingly be referred to the dolomite species. The strike or direction of the strata, as may be observed from the sequel, is nearly N. East and S. West, dipping at a considerable inclination to the N. West.

Conforming with the hornblende rocks of Dobundee is a calcareous sandstone formation with subordinate beds of slate clay enclosing their seams of coal. This sandstone is soft and friable, and must be distinguished again from another sandstone also calcareous, and of a still softer character. The latter formation is of very recent origin, and has taken place subsequent to the upheavement of the primary and metalliferous rocks, as may be well observed in the vicinity of Koh i Aeenuk, where it occurs in the form of sand-hill—the sandstone strata are horizontal, the primary again are all highly inclined, and sometimes even vertical.

What the upheaving rocks may be I am yet ignorant, but believe they will be found to be granitic, and if so, they must be of a much more modern geological era than similar rocks in England, from the position of the sandstone of Dobundee, which is evidently a tertiary deposit containing lignite coal. A section from the passes in the mountains of the Hindoo Kosh to the Indus would be extremely interesting in a scientific point of view, and convey no doubt an accurate idea of the structure of the country, but this however would form a separate branch of inquiry of itself, and is not of immediate importance to the present research, which has reference only to mining and metallurgy.

When I lately had occasion to bring the mineral resources of the Himalaya mountains before practical men and capitalists in London, the voluminous Geological Report of the able and intelligent officer, the late Captain Herbert, was never read by them. All that they cared about was that portion of it which related to the metalliferous minerals and means of working them; and what chiefly attracted their attention was, his account of the seven localities where copper was produced in the Provinces of Gurhwal and Kumaon.

In an economical point of view, therefore, the first thing to attend to in a district where metals are known to exist, is its probable productiveness; and for this purpose a very close and minute examination of every rock, ravine, and valley is necessary to discover if metallic veins, or indications of veins abound. I have found these appearances in all the following localities:—

Views and indications of Copper, old Excavations, &c.—At Moosye in the pass of Shadkhanee in the limestone range, on the right bank of the Sagur river, and to the west of the village of Kuttasung, I found purple copper ore in very small quantity cropping out to the surface.

In the pass of Silawat to the east of Kuttasung, I found copper pyrites in greater quantity cropping out there. On the crest of the same pass, or rather a short distance from it to the eastward, indications of the metal appear in that quarter also, and seem to point either to grey copper, or to the vitreous sulphuret. The strike of the strata is about N. E. by E., and S. W. by W., dipping at an angle of 65° to the N. W. by N. Beyond this also, and still further to the Eastward, specimens containing purple copper ore in small quantity have been brought me lately from Kohi Chaghgye.

Again near the base of the same range, and within a short distance of the village of Kuttasung, are three old excavations, blocked up with stones and rubbish. Two of these I have been attempting to

clear out lately with the intention of reporting on them hereafter. The ore is the purple variety, and I also found indications of the vitreous strike of the strata N. N. E. and S. S. W. dip 65° W. N. W.

On entering the Pass of Silawat, there is a ravine to the Westward, where a spring with a few trees may be discerned. About a couple of hundred yards above this spring is another old excavation, blocked up like the former, the declivity of the mountain is here very great; strike of the strata N. E. and S. W. dipping about 63° to the N. W. are copper pyrites, in a hard quartzose matrix, wall of the vein soft and slaty, and covered with the blue and green stains of copper. Here the limestone assumes a slaty structure and then verges into a micaceous rock, from which I conjecture that the ore at a greater depth will make (as the term in Cornwall is) to mica slate. The decayed and withered splinters of this slaty limestone, at first sight have much the appearance of clay slate—East of this again I found another excavation in a micaceous rock, evidently a continuation of the last mentioned, the direction of the strata the same, and dipping in the same quarter at a high angle, ore copper pyrites. In the same line I have traced this deposit to another locality a short distance off.

On the Eastern, or left hand side of the road going up the Silawat Pass, is another old excavation blocked up like the rest. Strike of the strata W. S. W. and dipping about 65° N. N. W.

I saw stains of copper here, but observed no further trace of the metal at the time I visited the spot; a specimen of vitreous ore has however been brought to me since, which is reported to be from that quarter. Higher up the hill, and on the same side of the road, is another excavation, where I found indications of vitreous ore. Strike of the strata about N. E. by E. and S. W. by W. dipping about 65° to the N. W. by N.

About a quarter of a mile to the Eastward of the last mentioned, there is a singular deposit. A vein or bed of iron ore, upwards of 30 feet in breadth, containing another vein of a mixture of iron and grey copper in a space about two feet wide. This mixture of copper and iron has been worked to the extent of a few feet, but the difficulty of separating the copper from so large a proportion of iron, was no doubt too difficult an operation for the ancient miners to be attended with profit, and must have been abandoned accordingly. Strike of the strata here N. E. and S. W. dip 75° N. W. From the direction of the strata, and the external character of this iron ore, it must I think be connected underneath with a great bed of iron ore nearly 40 feet in width, which I discovered in the Silawat Pass. The ore is massive, and is of a steel grey colour; sometimes it gives a blackish streak, and then it affects the magnet considerably, showing the presence of the protoxide. The great mass however gives a red streak, and below the surface will no doubt be found a well-defined bed of specular iron ore.

To the west of the crest of the Silawat Pass, and near the summit of the range, which I suppose must be about 1200 feet above the level of the plain of Moosye, are some extensive excavations. The general strike of the stratification here is about N. N. E. and S. S. W.—in some places it is nearly perpendicular, or dipping at a great angle to the W. N. W.; one of these excavations at first appeared to me like an open working, having the form of a perpendicular chasm in the mountain, the depth of which I measured upwards of 40 feet, and varying from 3½ to 8½ feet wide, at the deepest part the measurement was 7 feet and three quarters.

From further observation, however, I am inclined to suspect that this excavation, but especially others of a far deeper and more extensive character at Koh i Aeenuk and Seestungee, occupied originally the spaces of galleries, or levels, and that these have fallen in since, either from having been shaken by an earthquake, as the wreck and ruin presented by some of them would seem to indicate, or what appears probable, the action of water from the melting of snow at the surface, percolating by the walls or sides of the veins, has in process of time gradually loosened that portion of the ground which was left as a protection for the levels, and these levels having been driven along veins that preserve their course with the direction of the strata, which are nearly perpendicular, will account for the chasm-like appearance they now exhibit.

The system of mining which has been pursued here, differs materially from our improved modern methods. Instead of taking up a more convenient position for commencing operations lower down the brow of the mountain, and driving a gallery for a considerable distance, perhaps through barren ground, so as to reach the vein at a proper depth, and which opening is made at the same time to act as a drain, the plan adopted by the ancient miners seems to have been the making of a small entrance, about 3 feet wide, and 4 feet high upon the vein itself, and having gone down upon it at once in a sloping direction, until a certain depth was attained, they pursued a horizontal course, and stripped the roof of ore in their progress. This inattention to drainage has answered so long as the ore could be followed without the occurrence of water, but I suspect even then in some places, they must have felt inconvenience from the water caused by the melting of the snow in spring. I do not believe from the appearance of the galleries which are still remaining, that timber was much used, if employed at all for supporting them. The structure of the rocks in most places being of a compact character, and the great dryness that prevailed, may have enabled the miners to work to a considerable extent without that aid. In excavating the ore and opening ground, these people seem to have used a sharp-pointed well-tempered instrument, as may be observed by the marks of their work on the walls of the galleries, particularly at the mine of Seestungee.

As the most important point to ascertain is the appearance of the deposits of ore at a considerable depth, the width of the veins, &c. I have been particularly desirous of penetrating so far under ground as to arrive at the different spots where the ancient miners left off working. In some instances I got so far, that I believed I should soon accomplish that object, but I have invariably had my progress arrested by large masses of rock, stones, and rubbish which have fallen in. A native of Moosye lately brought me intelligence of some deep excavations which have been discovered on the eastern side of the Silawat Pass. Upon asking him why he had not taken a light to examine the interior, and see if they were more perfect than those I had already discovered, he gave me to understand, that like the rest of his countrymen, he had superstitious misgivings in regard to the exploring of those old and abandoned excavations, and was further deterred by observing the skin of a snake at the entrance of one of the galleries. The dread of meeting reptiles of this kind in these deserted mines, is one of the reasons why the people are so ignorant about them. The same individual told me, that often as he had hunted over those mountains from his earliest youth, he had not the least idea that the excavations were so numerous, only a few had been observed, or were known to the neighbourhood until I commenced my researches.

On crossing from the Moosye range to the mountains of Baghgye, I obtained some rich specimens of vitreous and purple copper ore in different places, and also copper pyrites, but did not observe any regular vein, except one of copper pyrites in hornblende gneiss, which is about 10 inches wide; this is very poor at the surface, but may however at some depth turn out rich. At Kotil i Dushtuk, I picked up a good number of stones containing copper pyrites in a hornblende gneiss formation, running N. E. and S. W. and dipping about 55° N. W.

This rock is very dark in some places from the prevalence of the hornblende, in others it has a yellow weathered appearance, and so much disintegrated, that I had not an opportunity of examining the locality well; there are quantities of rock, green-stained from copper. In one place where it was more compact, I obtained specimens from some strings or small veins of copper pyrites, in a quartz matrix, evidently connected with a larger vein, and from the abundant indications at the surface, I suspect that a considerable deposit must exist underneath. From Dundhancee in the direction of Jowhar to the south of Rotil i Dushtuk, specimens of green-stained rock have been brought me lately, and said to be in still greater abundance.

To the south of the Baghgye range is the great mine of Koh i Aeenuk, which I have already mentioned, all in a state of ruin and dilapidation. Purple copper ore crops out to the surface; and the excavations, as well as a quantity of slag and vestiges of ancient houses that remain, show what a productive mine this must have been in former days. The dreary and desolate aspect of the spot, with a solitary hut and a few squalid inmates, afford a melancholy contrast to the throng of industry which must have been witnessed here in better and more prosperous times. About a mile West of

Aesenuk is the mine of Seestungee, which I have also mentioned, and which is in a similar condition with the former. In this mine there is a chamber, one side of which is covered with sulphate of copper; the chamber is about 18 feet in length, 12 in breadth, and 10 in height,—and the end of it is blocked up with stones and rubbish. Some of the excavations here are so large, that they have more the appearance of caverns than mining galleries. A short distance from this, on the road to Koh i Aesenuk, I observed near the summit of a limestone rock several veins of spar carrying copper ore, principally copper pyrites; one of these is about 11 inches wide; between this again and Aesenuk, there is another spot where the green-stained indications of copper appear abundantly, showing, that the metal exists there likewise.

East of Aesenuk, in the mountains of Acoorookhall, I found a vein of solid copper pyrites about an inch thick in hornblende gneiss; at Esurtungee on each side of the torrent, I observed copper ore in many places, though I was not fortunate enough in finding a regular vein, whole cliffs of the rocks however are covered with the indications of copper. The richest specimens of red oxide of copper and native copper in my possession, were brought to me by a native, and said to be from the hills of George Mydan, not far from Acoorookhall. Of the locality, however, from whence they were procured I am doubtful, as the native alluded to was indebted to another for the specimens. I opened the ground in one place to the extent of several feet, and though a few indications of the metal appeared, many circumstances rendered it evident, that they had not been procured from that exact spot, and that a further search was necessary.

At Derbund, in Tungee Khooshk, in a gneiss and mica slate formation, I observed abundant green stains of copper. At Kila Ataye, there are several veins of quartzose spar carrying purple ore, one of which I measured about a foot in breadth, the rock is mica slate, and contiguous to limestone. In Cornwall the richest deposits I was told generally occur at the junction of the clay slate with the granite; and in this mineral tract, I believe the most productive will be found at the point of contact of the limestones with other rocks.

At Teseen, I discovered small veins or strings of rich ore ramifying in different directions, and forming a kind of net-work in a limestone rock. I saw no decided course of ore of any bulk, but what there is of it, is very rich, being composed of the vitreous and red oxide varieties, and native copper. The chief of Teseen, I am told, found a mass of the latter close by his house on one occasion, and so large, that a copper vessel was manufactured from it. This must have been brought down by the mountain stream, and most probably from the quarter I have mentioned.

In a ravine at Khoondurra, between Seestungee and Dobundee, I obtained some specimens of copper ore in small quantity, but did not discover any vein, though a closer search may yet succeed from the indications of the metal in that quarter.

At Dobundee, on entering the valley, I found at Shinky, on the right bank of the rivulet, specimens of red oxide and grey copper, but discovered no regular vein at the time. In a ravine named Lahasour, about half a mile from Shinky, I observed in a hornblende formation an outcrop of grey, vitreous, and red oxide of copper accompanying a vein of spar principally calcareous. Beyond this in another ravine named Zerasour, there is a thin vein of rich copper ore similar to the preceding—formation still hornblende; the strike of the stratification in this direction, is nearly N. E. and S. W. dipping about 45° to the N. W.

In the ravine of Chinarkhall, I found a vein* of copper pyrites cropping out in small quantity, and higher up at Chenar, less than a quarter of a mile from thence, I found a vein of grey copper, about 7 inches wide, with a considerable proportion of iron; this vein bends a good deal in consequence of the twisting of the strata, the general direction of which is about N. E. and S. W. dipping upwards of 60° to the N. W. The formations here are all hornblende.

* When I use the term of *vein* it is to convey my meaning in more familiar language, at the same time the Cornish phrase *lode*, which signifies a course of ore, would, properly speaking, be more correct. All the lodes in this country are what would technically be termed beds of ore conforming with the strata, and not veins, which are rents or fissures traversing the strata, and filled up with mineral substances.

In the ravine of Jerobae there is a ferruginous looking vein, containing vitreous ore, and also grey copper, the latter has a large proportion of iron, and is found about 5 or 6 yards apart from the former. On the opposite side of the ravine I found indications of the metal also, and beyond this in the same line, I found similar indications in a small ravine adjoining, and believe these to be all one and the same deposit connected underneath. The strike of the strata here is N. E. and S. W., all highly inclined. About 300 yards to the N. W. of these localities is another out-crop of copper ore, with a good deal of the same ferruginous appearance; this seems to bend towards the others, running nearly East and West, but is a distinct deposit in my opinion, and unconnected with them; these veins are all found in hornblende.

During my survey of Dobundee, I observed several rolled masses of a dark coloured iron ore brought down by the river. This ore yielded a blackish streak, and affected the magnet, but did not attract iron filings. What I observed was evidently derived from the surface of a bed of iron ore. In the Chenar ravine, about a couple of hundred yards from the vein of grey copper, which I have described, I obtained a few fragments of magnetic iron ore which powerfully attracted the filings, but saw no trace of a regular deposit in that quarter. These facts, however, render it not improbable that a bed of magnetic iron ore may exist in the neighbourhood; having not yet completed my examination of that part of the district, I regret I cannot speak decidedly on this subject.

Extent of the District, &c.—With regard to the extent of this mineral tract, Tezeen is the furthest point to the Eastward, where I have found copper ore, and specimens of copper pyrites have been brought me from Wurduk to the Westward. Specimens of purple ore have been sent me from Spegā to the South, and I have traced the metal as far North as the hills about Cabool.

The most promising veins I have discovered are those of Derbund and Dobundee,—of the old mines, Koh i Aeenuk holds out the best prospects. I have reason to believe that more veins equally, if not more favorable, may yet be found, when every rock is sufficiently investigated. A perfect examination of this kind, is of great importance, for the two-fold object of showing the external signs of the productiveness of the strata, and guiding the miner at once to the most desirable points for experimental operations. From the number of natives I have been employing to search for me throughout the district, and who well understand now what is wanted, I feel confident that if this plan were continued for a short time longer, not a spot would remain unexplored. Specimens have been lately brought me from new veins in Derbund, as well as from Rojan, and Sungdurra on the southern side of Koh i Kubeer, the most elevated of the mountains in that quarter of the country.

In my former Report, I mentioned that I had discovered the richer varieties of copper ore, namely the purple and vitreous sulphurets, the former containing 60 per cent of metal, and the latter about 80—I have now the satisfaction of adding to these the red oxide containing 90 per cent, and native copper. As far as the character of the ore is concerned then, it is of the first quality. Of course what I allude to is the pure mineral unadulterated by the matrix. What the ore in mass will produce should the mines be opened, can only be determined when that takes place; but it will I think, yield about the same as the Chilian, namely, between 20 and 30 per cent. The average of the ore of Cornwall is between 8 and 9 per cent, and, as I stated in the Report alluded to, it is this difference in the quality of the ore, that enables the Copiapo Mining Company to dispose of their ore in England at a profit, notwithstanding the vast distance of transport. The ore is brought down on the backs of mules from the heights of the Cordilleras to the seaport for £3 per ton, shipped from thence to Swansea in Wales for £5 per ton, when it is finally smelted, and the produce exported abundantly (no doubt to India) as English copper.

Mineral Prospects of the District.—In respect to the capabilities of this mineral district no one can take upon himself to form an estimate of what is underneath the surface, until practical trials are made, but, if we base our calculations on the most reasonable probabilities, there is every expectation that these trials will prove eminently successful.

By the foregoing details it is apparent, in the first place, from the number of veins and indications of them which have been discovered, that the whole of the strata are highly metalliferous.

Secondly, the quality of the ore is excellent, and the richest varieties are to be found.

Thirdly, it is evident, from the extent of the excavations of Koh i Aeenuk, Seestungee, and Moosye, as well as the quantity of slag still remaining at the former place, that the people who worked these mines, must, in following the ore to a considerable depth, have found it increasing, or at any rate not diminishing in quantity.

Lastly, we may reasonably infer, that these people, by confining their operations to so few localities, found the work sufficiently plentiful and lucrative to give them employment, without being under the necessity of opening new ground, and this will account for so much being left untouched. The mines also must have been abandoned in consequence of some political convulsion or foreign invasion.

Facilities for working the Mines.

Of the means of drainage, I may say, that in general there is no want of declivity of ground for obtaining adits—the term *adit* is a technical one in mining, used to denote a gallery or passage which acts at the same time as a drain. In an economical point of view, this is of great importance, as the system of working by a succession of galleries above the adit-level in some mines, or having to go but a short distance under it in others, is attended with much less outlay than when the reverse is the case, and mechanical power must be had recourse to, for raising the water from a considerable depth to the drain. In the Gwennap mines in Cornwall, for instance, where the deepest shaft is about 1700 feet below the surface, there are no less than seventeen steam engines, some of which are of enormous size, and these, with a water wheel 42 feet in diameter, are employed night and day in pumping the water, and raising ore and rubbish from the mines. In the Moosye ridge, the principal mines are situated about the summit of the mountain; at Koh i Aeenuk again, which is but a small hill in comparison, there appears to be abundance of room for bringing in an adit under all the old workings, but at Seestungee, this would not be managed so easily. The whole of this metalliferous tract, however, is so much more elevated and mountainous than the mineral ground of Cornwall, that the unwatering of the mines could be effected with greater facility, and at much less expence.

Small streams for washing, cleaning the ore, &c. are often wanting in these mountains, but this defect may be remedied wherever springs may be observable, by piercing the slopes with *karezes*, and obtaining the necessary quantity of water. At Derbund, there is a small stream which passes close by the veins of purple ore I have described. The river of Sogur pursues its course along the base of the range at Moosye, where the mines are situated; the rivulets of Dobundee, Tezeen, Chuckeree, &c. at all seasons of the year have a sufficient supply for moving machinery, whilst mountain torrents, such as those of Raourtungee and Jerobaee, possess I think sufficient water, considering the greatness of their fall, for turning stamping mills, and crushing apparatus of that description.

The pine forests which stretch from the Sufued Koh to the Southward, will afford a permanent supply of wood for timbering the mines, and charcoal for the smelting furnaces. The same carriage which would convey the ore to the fuel, would bring back timber for the mines. The furnaces best adapted for this country, are not the reverberatory ones of Swansea, where coal is the fuel, but

the blast furnaces of Sweden, where charcoal is employed. It will be a matter for future consideration, whether the most desirable site for these would be in the direction of Spega and Hazardurukht, or of Tezeen. The former will have the advantage of being better situated for labourers, whilst the latter, by being near the Cabool river, will have the convenience of raft carriage to the Indus.

Mining operations may be commenced in this country without incurring much expence in road-making at the outset. At present the roads are only tracks, but they answer camels, and the mountains afford pasture for the maintenance of these useful animals. Mules, ponies, &c. are also used for carriage, and the neighbouring district of Koorrym is famous for its breed of the former. Roads for wheeled carriage may in process of time be made, as improvement advances, and this will create a great saving in transport throughout the country generally. An excellent one might be cut from Cabool to Dobundee, by the plain of Sogur, and no doubt the same could be continued to the banks of the Indus by the valley of Koorrym; guns at any rate have already been taken by that route. As soon as this road is surveyed and repaired, and political obstacles are removed, the circuitous route by the Khyber Pass will be forsaken for this shorter and safer line of communication with Hindoostan; meanwhile as far as the mines are concerned, the most economical method would be to purchase a certain number of camels, the transport management could then be conducted at a moderate expence, and occasion very little trouble.

The occupations of these mountain tribes are partly agricultural, but chiefly pastoral and commercial. Those who have flocks of sheep migrate from place to place according to the season of the year, whilst those who have camels, engage in trading speculations, and in hiring out their camels for transporting wood, charcoal, &c. to Cabool, salt from Kalabagh and Malgeen, iron from Bajour and Foormool, and merchandise to and from Peshawur, and various other quarters.

I regret to add, there is another class that I call the predatory, which the poverty of the people, the distracted state of the country, insecurity of property, &c. appear to have brought into existence, and gangs of these banditti have been infesting the country to the no small detriment of the industrious merchant. The different tribes which contain this class within them, are the following :—

Adrumzyes	Rob by night.
Muminozyes	Ditto ditto.
Ahmedzyes of Spega	Highwaymen by day.
Kurrookhails	Ditto by day and night.
Khivazuks	Rob by night principally.
Ooreakhails	Ditto ditto.
Oothkails.	Thieves by day principally.

These molest the country between Ghuznee and Jelallabad—some rob chiefly by night, break into houses, annoy an encampment, &c. others steal in broad daylight, in the bazar of Cabool even, and are famous for their dexterity in pilfering; whilst others again come down from the mountains in force, attack a cafile, and return immediately with the property they have captured.

It need not be supposed, however, that because a portion of the people have hitherto been leading this lawless life, that the hope of establishing useful works, even in the secret haunts of these robbers, is by any means impracticable. It must be remembered, likewise, that a revolution has taken place in the country, and that during the last year, the constant political excitement which was kept up, of itself produced much of this evil. Formidable as the state of affairs may seem, the difficulty of uprooting the evil is much more in appearance than in reality. There is indeed a regular system of robbery carried on, which must be systematically dealt with, to be effectually put down. This I believe may be accomplished without levelling a single fort, ravaging an acre of ground, or spilling one drop of blood. The Ghilzyes of that district, are about the finest race of people I have seen in Afghanistan, and the predatory portion, though wild, are far from being intractable. But they have been long living without the pale of the laws, in a country distracted and torn with feuds and dissensions, without any security of property; the strong ever oppressing the weak, and have in a great measure been brought by circumstances into this lawless mode of life. Give them, however, but constant employment, with good wages and regular payment; encourage a spirit of industry, both by precept and example; let strict justice be dealt out to them without respect of persons; and we shall shortly see their swords changed into ploughshares, industry take place of licentiousness, and these people be converted into peaceable and useful subjects. A firm, but just and liberal hand, in my opinion, might mould them into any thing.

During the late disturbances, it was often remarked to me, what a detestable race these Afghans were; that a man could not stir a few yards from his house or his tent, without the risk of assassination; and that three times the amount of military force was scarcely sufficient to keep this unruly country in order; and yet, I have gone with but a few followers into the midst of them, have wandered amongst the wildest and most desperate characters, often without a sword at my side or a pistol in my belt; and even during the very crisis alluded to, when I returned to Cabool, I did so entirely in opposition to my own views and inclination, and only in accordance with an express order to that effect.

Since I commenced this research, I have made a point of living with the people, and I am of opinion, that in any attempt to develop the resources of a country, an acquaintance with the character of the inhabitants is a matter of serious consideration. The result of my observations are these: that if we take advantage of the keen commercial spirit of this nation, and direct its energies into the many useful channels which may be opened to them; if the conciliatory policy be steadily persisted in, all gloomy suspicions as to our future intentions removed, and the Afghans become persuaded that we are really their friends;—there is no quarter of the east where British influence will more rapidly take root, and British power be more readily consolidated—whether the nature of the climate, the wide field for European improvement, or the freedom from prejudice on the part of the people be considered.

It is not easy to say exactly, what the rate of payment for labour would be in those mountains, when order is completely restored, and a new state of things brought about; but there can be no doubt of this, that it will be moderate.*

* Osman Khan, who is a considerable landed proprietor himself, and experienced, is of opinion that only one-third of the available land of Afghanistan is under cultivation.

Osman Khan informs me, that during Dost Mahomed's time, he used to hire able-bodied labourers for cutting canals, and reclaiming waste land at Balabagh, at the rate of two annas per day; but that now he hires them for about three annas. The rate which at present exists in Cabool is a forced one, the result of a combination of circumstances, which can only last for a limited period until things find their proper level.

The Jajee tribe, and other industrious mountaineers, are all robust and stout-looking people, and during the winter travel as far as Peshawur for employment, which they would not be induced to do if work were afforded them at home. There are few points in the country more favorably situated for a command of good workmen than the mining district under discussion.

As the price of labour, however, is directly affected by the price of food, it will be a matter of great importance for the successful working of the mines, that the arable land in their vicinity be properly attended to. If the mountains bear witness to an extent of industry unknown to their present ill-fated occupants, the state of agricultural affairs in the adjoining fertile plain of Mogur, bears equal evidence of a former state of great prosperity, and points, in a significant manner, to the withering effects of Afghan misrule. The remains of ancient canals and water courses, the quantity of available land now lying waste, or in a low state of cultivation, the wretched condition of the people, and their inability to procure the necessary means of cultivating the soil, all show how much might be done by the application of capital, as well to the labours of the field, as to the dormant mineral resources of the country.

In conclusion, the following facts I would submit, may be considered as fully established, viz.:

Decided indications of abundance of copper, and of the richest varieties of ore. Wood in abundance, for timbering the mines, and for charcoal.

Water as a moving power for impelling machinery, thus obviating the expence of steam, camels, mules, &c. for carriage.

A hardy and able-bodied population on the spot, anxious to be employed as workmen.

Here therefore are the means for the production of this metal, and apparently to any required extent. It now only remains, that the inquiries I have had the honour of commencing, should be followed up; arrangements made for the suppression of the preparatory system; the providing an adequate capital for working the mines on scientific principles; and adopting such measures as will facilitate the transit of metallic produce to water carriage on the one hand, and the different marts in the interior on the other.

Iron of Northern Afghanistan.

As no mining operations can be carried on without a command of well-fabricated iron, the state of the manufacture of this indispensable metal becomes a primary consideration, in any attempt to render the mineral resources of an uncivilized country available; and certainly if any thing be required to show the abject state of the arts in this quarter of the globe, the iron trade and manufacture may be quoted as an instance.

The iron of Bajour, which is produced from magnetic iron sand, is not only in use throughout the northern districts of Afghanistan; but from its superior quality, is

likewise in great demand in the Punjaub. It sells in Cashmeer, for three times the price of the common iron of that country, and it is used in Candahar for the fabrication of matchlocks.

Were an improvement in the manufacture to take place, iron might no doubt be obtained equal to the Swedish—the best description in Europe. It was my intention to visit the district of Bajour at this time; but having been prevented from accomplishing my object, I am dependent on what information I have picked up hastily from merchants and others, who have been in the habit of visiting it, for the purpose of purchasing iron. The supply of iron, however, which the mountains in that direction afford, must be perfectly inexhaustible, from the intelligence I have derived, as to the immense quantity of this iron sand, which is annually washed down from their deposits.*

A sample of the sand was brought to me sometime ago, and taken from the bed of the stream at once, without being sifted and prepared for smelting. On applying the magnet, the ore was immediately taken up, and the quartzose and other strong particles remained. I then placed a small quantity of iron filings in contact with the ore, and the mutual attraction of the filings with the crystals of ore, was easily recognized with the assistance of the magnifier. It is described as occurring in great abundance in the mountain streams of Deer, Belour, and Mydan, which fall into the river of Punjcora, that ultimately joins the Cabool river below Peshawur.

The methods of reduction in this country, appear to be the same with those employed in different parts of India; and the manufacture in the Himalaya mountains, already described by Capt. HARRIS, is equally applicable to that of Bajour. It is evident, that whatever quantity of the ore is submitted for reduction, a small proportional part of the iron contained in the ore is brought to the state of useful iron. In the first process, a very crude mass of iron and scoria is produced; this crude mass is then submitted to the fire by a blacksmith, and after an incredible sacrifice of labour, a piece of malleable iron, fit for ordinary purposes, is at last produced, which, as may well be supposed, is any thing but the purest.

A more rude and inefficient system of smelting could not be devised, nor must it be understood from the simplicity of the management, that the processes are economical—they are the most expensive which could possibly be employed. It would be absurd to suppose that a refractory metal like iron, can ever be properly or economically fabricated by means of a great expenditure of manual labour, to the neglect of a mechanical power, such as a plentiful stream of water can afford, and which is to be obtained abundantly in the district that yields the sand I have described. So long as the miserable air bags, and a common blacksmith's sledge hammer are used for that purpose, iron inferior in quality, very deficient in quantity, and at an extravagant price, must be the necessary consequence.

But Afghan inexperience and mismanagement does not stop here. The crude iron is not converted into malleable on the spot, where charcoal abounds and labour is exceedingly cheap; but is transported slag and all, to Cabool, for instance, where both charcoal and labour are exceedingly dear. Again, in working up this

* Should there be a proportion of titanium combined with this ore, I imagine it will be trifling. When I submit a supplementary Report, with the chemical analysis of different ores, this will be explained. The colour of the iron sand is dark black.

crude iron into malleable, one-third is lost, so that the unfortunate purchaser has not only to pay for an expensive and ill-manufactured article in the first place, and for the difference in the price of labour and charcoal, pointed out in the second, but for the carriage of a large proportion of dross.*

The cost of the transport of a *khurwar* of iron, (13 Hindoostanee maunds,) in Dost Mahomed's time, was about Rs. 15 from the Punjcor ariver to Kooner, and from thence to Cabool Rs. 10, making in all Rs. 25. At present, the hire will I am told, be about Rs. 35; but for the sake of example, let Rs. 30 be looked upon as the expence of conveying a *khurwar* of iron from the Punjcora river to Cabool. A hundred *khurwars* of this iron are said to be about the quantity annually consumed in Cabool, in the time of Dost Mahomed; lately the demand has greatly increased. Taking this quantity only, however, as the estimate, we have at the rate of Rs. 30 per *khurwar*, an expence of Rs. 3000 for carriage; but to render the iron fit for use, one-third is lost, so that an expence of Rs. 1,000 is every year incurred in Cabool, for the conveyance of slag. The information I have been able to gather respecting the probable quantity annually produced in Bajour is so vague and contradictory, that I do not feel justified in carrying out this calculation farther. At a guess, I believe it must be about a thousand *khurwars*; but be this as it may, there is no doubt that the saving, effected by a well manufactured article in the mere transport alone, would in a short time cover the expence of erecting an iron work upon the Swedish principle.

As a set-off to the practical difficulties inseparable from establishing works of this kind in a new and uncivilized country, the advantages which the manufacture of Bajour would possess over that of Sweden, would be these:—

First. The difference in the price of labour, the wages of a workman being about 2 annas per day, according to the present rate; whilst labour in Sweden, though moderate, varies from 6d. to 1s. per day. Allowing, however, that the price of labour should rise in Bajour, and that able-bodied workmen received from 2 to 4 annas per day, still the rate would be considerably less than the Swedish.

Secondly. The circumstance of mining being commuted for the easy process of collecting and washing the sand, would occasion a great saving of expence; women and children are employed in this operation.†

Thirdly. The forests are described as being of great extent, and close by the localities where the iron sand is collected, and the charcoal used, is made from oak (*quercus beloot*), which is the best adapted for that purpose. This will give the manufacture of Bajour a decided superiority over that of Sweden, where the light charcoal of the pine only is used, oak and hard wood being scarce in that country—the charcoal moreover is transported in sledges during the winter, a distance frequently of 30 miles to the furnaces.

I shall here offer a few observations on the subject of the iron in Northern India, for the purpose of showing, that if an improvement be called for there, the argument applies with still greater force to the remoter regions in this quarter.

* The iron is sold in the shape of bricks of different sizes. In making a trial the other day of one of these, which weighed one seer of Cabool, (equal to six seers of Hindoostan,) I obtained out of 16 parts, 10 of iron fit for use.

† The iron sand is brought down annually by the melting of the snow in spring, and in such vast quantity, that for one iron work at any rate, the supply is ample without having recourse to mining.

It is commonly imagined in India, that because English iron is brought out as ballast, and landed on the coast for little more than the price it costs in England, that an improvement in the native manufacture would therefore be attended with difficulty. But however much this may apply to the coast, the case is altered when English iron is transported into the interior. It then becomes enhanced in price, and from this cause, as well as the inferior materials of which it is composed, the demand is limited, whilst the native manufacture continues active under all the disadvantages of the most wretched system of smelting, and which, as I have already remarked, is in fact, the most expensive that could be employed.*

All the iron of England, (with the exception of what is produced at Ulverstone in Lancashire,) is made from clay iron stone, which yields about 30 per cent. of metal, and the fuel used being coal, the sulphur combined with the latter deteriorates the iron, and soft or malleable iron cannot be produced equal to the article that is afforded by richer ores, and charcoal smelting. In the Northern Provinces of Hindoostan we have the richest iron-ores, namely, the magnetic, and also the different varieties of the red oxide, such as the specular, red hematite, &c. and these will yield from 50 to 65, or perhaps 70 per cent. of metal, which is all in favour of the saving of fuel and general economy.†

At Ulverstone in Lancashire, iron is manufactured from red hematite ore, yielding sometimes 50, and sometimes 60 per cent. of metal; the fuel is oak charcoal, and a superior iron is produced, which is of great tenacity, and much used for drawing into wire; steel also is made from it for secondary purposes.

During my inspection of these works some years ago, I was closely questioned by one of the iron masters as to the prospects of establishing an iron work in the Himalaya mountains: for example, I was asked about the nature of the ore, and if a sufficient supply of charcoal was to be had, if water as a moving power was abundant, labour cheap, and if water carriage was procurable, &c. &c. To which I replied, that amongst different varieties of rich ore, the red hematite, the same he had at his works, existed also in that quarter; that charcoal was to be had on the spot, for the price only of cutting the wood and preparing it, as the forests were interminable; that labour was about 3d. or 4d. a day; streams capable of turning any machinery abounded, and water carriage was within a tangible distance of the base of the mountains; that the disadvantages at present, were owing to the want of proper commercial roads from the mines to the plains, which nevertheless might be made by following the course of the principal rivers, as indeed had been done partially in one case, for the sake of pilgrims. I then rallied him about the anxiety he seemed to evince in the matter, and asked him if he was afraid of my running in opposition to him so far off as India, and moreover 1,000 miles in the interior; to which he replied, "Why to tell you the truth, we send out a quantity of iron to India."

Now whether the iron of Ulverstone be used in Calcutta for the manufacture of suspension bridges, I am not at this moment aware; but when I left Kumaon two years

* According to Mr. McCULLOCH, three-tenths of British iron are used as cast iron, and principally consumed in the United Kingdom, the other seven-tenths are converted into wrought iron.

† Some of these iron mines are situated near the plains, some are higher up, and the copper mines higher up still. The principal iron mine is at Khetsari, in the broad and fertile valley of the Ramgunga.

ago, thirteen of these bridges* had been erected, in a province abounding with iron mines, and inexhaustible forests, and with reference to which, a celebrated mining engineer, in corresponding with me upon the subject, makes the following remark: "It strikes me, that if an iron work is begun in the Himalayas, iron can be afforded to India at a rate lower than the present to a great degree, and at the same time afford a large profit per ton."

In the district of Bajour, an iron work upon the small scale, and similar to the Swedish, might be erected with every reasonable prospect of advantage. When water power can be procured, and a steady supply certain, the saving will be great,† as compared with the application of steam power; a substantial wheel can be erected at a small expence, for working blowing apparatus capable of giving blast to two furnaces; commencing in the first place with one, in order to learn by experiment the suitable charges of iron ore, charcoal, and limestone; and to find that very little iron is mixed with the scoria, which comes off constantly from the iron at the bottom of the furnace.

Should an improvement of this kind take place in the Bajour manufacture, iron of a much better quality, in much greater quantity, and at a reduced expence, might be afforded to the whole of those countries situated between Ghuznee and Lahore; from the excellence of the materials, no foreign iron can ever compete with it, and superior steel may also be obtained from it. No iron manufactured with coal can ever be converted into steel, owing to the presence of sulphur in the coal. It is in consequence of this, that the great mass of steel in England is made from Swedish iron, and the cast steel for the superior cutlery of Sheffield, is from the iron of the mines of Dannemora, the ore of which, (massive magnetic,) differs from all the others in Sweden, on account of its purity; and the iron sells on that account for about double the price of common Swedish iron. The other ores of that country are, I understand, principally magnetic; but more or less contaminated with sulphur, and had they not the advantage of charcoal smelting, the iron they produced would not sell at the high price which is obtained for it.

The prices of crude iron in Cabool in time of Dost Mahomed Khan, and since then, have been the following:—

	In Dost Mahomed's time. Cabool Rupees.				Latterly. Cabool Rupees.	
Bajour iron per md..‡	8	..	..	..	12	
Foormool ditto ditto,	6	..	..	..	9	

* The transport of the last of these bridges, which was put up at Jula Ghant on the Kali Gogra river, amounted to Rs. 80 per ton. This reminds me of a story that is told in the neighbourhood of Loch Earn, in Perthshire. In a small glen on the Northern side of the lake, a building was erected about a century ago, when there were no good carriage roads in that part of the world, as is the case at present. The lime used on the occasion, was brought on the backs of horses from a considerable distance in Fifeshire, and it was left for the succeeding generation to discover that an excellent bed of limestone existed in the same glen; but this was not all, for the house itself was built of limestone.

† Perhaps the finest example that could be quoted of the effect of water power in saving manual labour, is at Turton near Bolton, where there is an iron wheel at a cotton mill, upon the spider arm construction, overshot, sixty feet in diameter, and ten feet broad in the awes or buckets. From this wheel, the power is taken for moving all the spinning machinery within the mill, which is reckoned equal to 50,000 cotton spindles, or the work of 50,000 people.

‡ The maund of Cabool is equal to 8 seers of Cabool. The seer of Cabool, is equal to 6 seers of Hindoostan.

The iron of Foormool is from the country of the Wuseerees, in the direction of Kaneegcorrum. It was my intention to have visited this district after surveying Bajour, for though the iron is much inferior to that of Bajour, it is very abundant, and extensively used for implements of husbandry, horse-shoes, cannon balls, &c. The specimens of ore which have been brought to me, and reported to be from that quarter, are clay iron stone, and I believe this to be ore, from the fact of coal existing in that vicinity.

Should a foundry for cast iron be eventually required in Afghanistan, the iron in the Wuseeree country will be well adapted for the casting of shot, shells, engine cylinders, pumps, &c.; whilst for bars, rods, fire-arms, &c. the superior iron of Bajour will always be preferred.*

I have mentioned the existence of iron ore in the copper district which has been described. The Moosye iron is not conveniently situated for fuel to render it of immediate importance. A specimen, however, of iron ore has been brought to me from Huryoob in the Jajee country, which borders on that district. The ore is of an iron-grey colour, and gives a red streak, but does not affect the magnet. It is reported to be in great quantity, and the country is described as being covered with jungle. Should the copper mines in the course of time be worked on a great scale, and the consumption of iron proportionate, mines of the latter metal will also be worked there, for the sake of the demand in that neighbourhood, and of Cabool.

In concluding these imperfect notices on the subject of the copper and iron deposits of this country, I would beg to observe, that in directing attention to the former metal, I do so, not only on account of the demand of it for coinage, and the ready market it meets with from its extensive use for domestic purposes throughout the countries to the west of the Indus, but from the known demand for it to the east of that river likewise.

Should gold or silver mines be discovered in these regions, and there is nothing unlikely in the idea that they may, the probability is, that they will always, as far as intrinsic value is concerned, occupy a very inferior scale of importance to the copper repositories.

If it be a common saying in South America, (the richest country in the world for the precious metals,) that "a copper mine is a fortune, a silver mine scarcely pays itself, but a gold mine is ruin," we may readily conclude, that in this quarter of Asia, where there is such an extensive consumption of the former, the observation is still more likely to become applicable.

But valuable as these repositories of copper may prove, they again need not be expected to equal the results which may be anticipated eventually from working the great stores of iron to be met with in Afghanistan.

By rendering the copper available, however, for which there is such a great market, a fresh demand is provided for the iron, and an improvement in the manufacture

* There is another iron produced in another locality in the Wuseeree country, from which steel is made. The ore I have not yet seen, but it must be from a different formation to the one which contains the clay iron stone. I shall advert to this in my supplementary report.

of the latter will not only directly aid the working of all metallic veins which may be found, but become the basis of various superstructures, and when its more general use is induced by a deduction in price, civilization and improvement will rapidly extend.

It is commonly supposed in this, as in other barbarous countries, that Russia must be rich, since gold mines are reported to be there. But the gold, the platina, and other metallic produce of the Urals, are well known to be far inferior in financial importance to the iron, and if in the Uralian chain, the activity and enterprise of the Muscovite can fabricate annually the large quantity of 7,400,000 pood, (132,000 tons) of iron, what may not British energy and industry effect, when they come to be applied to the vast deposits of iron, and the deep and endless forests of the Indian Caucasus and Himalaya.*

Remarks on other Mineral Productions of Northern Afghanistan.

I proceed now to offer a few observations on the other mineral productions of this country, and I may here mention, that the plan I have been pursuing hitherto, has been to employ the natives themselves to search in all directions, and bring me every kind of mineral which has the appearance of an ore. The exciting a spirit of inquiry in this way, although it has been expensive to myself, is by far the most expeditious method of enabling one to arrive ultimately at a general knowledge of what the country may possess. During the previous year, the political ferment that existed thwarted my success very much; but now that these troubles have ceased, and the attention of the people is withdrawn from them, the fruits of this plan, if followed up, will become much more apparent. Nothing can exceed the avidity with which the Afghans enter upon what to them is so novel a pursuit; and the laborious, and ardent manner in which they traverse the most rugged rocks, and most unfrequented places, when stimulated by an appeal to their interests. It is my rule to pay them well, when I have any thing like proof that they have worked hard, even though they have been unsuccessful; and, on the other hand, if successful, they are sure of a handsome reward.

Of the valuable mineral coal, there are three directions in which lignite coal is found in the northern districts of Afghanistan.

The first formation is along the line of the Indus, the most promising locality of which appears to be near Kaneegoorum in the Wuzere territory.

Parallel to this, is a second outcrop of coal in the Ghilzye territory, which I discovered lately at Dobundee, and whilst I have been writing this paper, specimens have been brought me from Hissaruk.

The third formation is in the Huzarah country; specimens of this have been brought me from the vicinity of Syghan.

* According to a pamphlet published in 1825, by Mr. H. J. PASCOTT, for the removal of the high duty on foreign iron, it is stated: "The quantity of iron exported from Stockholm in the year 1822 and also in 1824 was 36,000 tons. Sweden in general exports perhaps 100, or 102,000 tons."

All of these deposits of coal are of the lignite species ; the mineral is of a velvet black colour, and approaching to jet or pitch coal. The Kaneegoorum coal burns freely ; and with much flame and smoke ; the Hissaruk is rich-looking, crumbles into angular fragments, and particles of it, as well as that of Dobundee, which I have tried in the flame of a candle, burned well, considering that they were obtained from the surface. What I have as yet discovered at Dobundee is in very thin seams, pulverulent, and resembling coal-dust more than anything else. The Syghan coal ignites with great difficulty, and the flame, which is very slight, has a greenish tinge. Underneath the surface, this character may be expected to alter considerably for the better.

Although this coal is of a subsequent geological date to the mineral we are accustomed to use in England, which belongs to what is technically termed the " independent coal formation," it by no means follows, that profitable beds of it may not be discovered, and in time create a great change in the comfort and commercial prosperity of many parts of this kingdom, where wood is extremely scarce. Coal of this description is extensively used in many parts of Europe, and is frequently of excellent quality.* It is mined in the island of Veglia for the use of the Trieste steamers. Twenty-eight beds of it are wrought about Toulon and Marseilles. At Colognet here is a bed of it 30 feet thick ; the mines of Styria, and of Buda in Hungary, are famous for their immense supplies of this fuel ; great beds of it are worked in Switzerland, in the valleys of the Po, the Danube, and other quarters of the continent.

It will readily be acknowledged, therefore, that although the coal deposits of this country belong to a more recent geological period than that of the independent coal formation, it would be an unphilosophical conclusion to suppose on that account, that they may not exercise the happiest influence on the welfare of its inhabitants. To the Huzareh, the possession of this substance, if found in sufficient quantities, would prove most invaluable. It would enable him to work with every advantage his abundant mines of iron, copper, and lead ; and in a country with so rigorous a climate, and so destitute of fuel, it would be to him the most useful production. Should profitable beds of the mineral be discovered in the direction of Dobundee, there is a level road from it to Cabool, by the plain of Sagur ; and how far the formation may be traced along the Ghilzye tract is yet unknown.

Lastly, the coal of the Wuseeree territory may turn out of importance, as well for the working of the extensive iron mines in that quarter, as for steam navigation on the Indus.

Amidst the numerous samples of ores which have come under my observation, the gold which is brought down by the streams from the mountains Gold, &c. above Lughman and Kooner, is all that I have as yet seen, which I can pronounce upon as pertaining to the precious metals. It is stated to be found likewise in streams from the Kohi Baba range, in the country of the Huzarehs, and

* At a single establishment in Wales, there are 13 large blast iron furnaces at work, and it is estimated that their consumption of fuel is 400,000 tons of coal per annum. Works like these convey an idea of the stupendous industry of England.

also in some of the streams of Kohistan ; but I have not yet received specimens from these districts ; the report however, is not at all improbable, and I believe myself it will be found all along the line of greatest elevation of the Hindoo Kosh and Indian Caucasus.

Whether this gold occurs originally in a disseminated state throughout the strata from which it is detached, or whether there exist distinct repositories of the metal, and in connection with some of the beds of iron, which from the iron sand that accompanies the gold must be intersected by the streams, is a subject for future inquiry. To the best of my recollection, all the gold brought to London by the Brazilian Mining Company is found accompanying iron, whether in the alluvial deposits from which it is washed, or the mines where it is worked.

Specimens without number have been brought to me from various parts of the country, supposed by the golden hue of the one, and the silvery whiteness of the other, to belong to the precious metals. In none, however, have I been able to recognise any thing beyond the sulphuret of iron under different forms, and a compound perhaps of sulphur, arsenic, and iron. There are some specimens, however, respecting which I am not quite certain, and these I shall transmit for chemical examination. Having nothing but my blowpipe apparatus to depend upon, when any doubt exists as to the constitutions of a mineral, it is desirable that they should be subjected to the test of analysis. On one occasion I tried a specimen from a deposit in Dobundee, (the ore externally has the appearance of an ore of silver,) and I saw a small head which appeared not unlike impure silver, but since then I have repeated the trial frequently without coming to any satisfactory result. The fragment of a mineral, however, which is submitted to the action of the blowpipe is so very minute, being no larger than a grain of pepper, that I should not wish these attempts to be considered final. Argentiferous arsenical iron is worked in Germany as an ore of silver, and should that metal be discovered in this country, it will probably be found in combination with some of these ores, or what is still more likely, with some of the numerous veins of lead which are to be met with.

Amongst all the specimens of iron pyrites, which have been brought to me, I have seen nothing that could be termed curiferous. Latterly, I have heard several reports of the existence of silver, but the Afghans are so addicted to the marvellous, and so easily imposed upon by designing alchymists, that I would never attach the smallest credit to them, unless a specimen of the mineral be produced. By all accounts, the Huzareh country must be the richest in minerals of any other in Afghanistan, from the number of old mines said to be there, and the remains of ancient cities in their neighbourhood, which would seem to indicate, that its mineral wealth in former times had been the cause of attraction. Whether silver may exist amongst these mines, is a point to be ascertained.

A story was told me lately by Aga Hoossain, a merchant of Herat, that at Mough in the Eimough or Eimouk country, there is an inscription in the Hebrew character, on a large black slab, to the effect, that in the days of king Jumshed, (1274 years ago,) the following mines were discovered :—

3 of Silver,	1 of Copper,
1 of Lapis Lazuli,	2 of Lead,
3 of Iron,	1 of Sulphur.

I doubt the genuineness of the whole story, but there is I believe no doubt of the fact, that old mines do exist there, and what they are, is yet to be ascertained. My informant says that he saw a number of old grinding stones in a stream close by the mines, which are believed to have been used by the ancients for crushing ore. It is reported also among some of the Huzarehs, that a number of golden vessels were discovered once in some of the old mines of their country, and there is a tradition of gold mines having been worked, but that the vein or veins are now lost. To tales like these I attach no importance, further than as a stimulus to, and a necessity for, investigation. I believe, moreover, from the specimens of iron, lead, copper, sulphur, and coal, which have been brought to me from thence, that the whole of that country is a rich mineral tract, and if the precious metals do exist there, as they are generally found in small quantity, it must be remembered, that their discovery is not likely to take place all at once, but to be the work probably of time and patient inquiry. A speck of gold in a piece of quartz may point to a deposit of that metal; or an accidental circumstance, (such as a Populzye chief related to me the other day,) may lead to the discovery of silver: namely, that many years ago small particles of it had been observed in a stone on which a fire had been lighted.

A specimen of cinnabar, (sulphuret of mercury,) was brought to me once by a villager, who said he had found it in the neighbourhood of Sultanpore near Jelallabad; but as I did not find any traces of it in the rocks in that vicinity, the probability is, it may have been dropped there by accident. Cinnabar is a rich ore of quicksilver, it is a production of Thibet, and if it be ever found in this country, it will more likely be discovered in the direction of the Kohi Baba range than elsewhere. I lately heard also of a very heavy red coloured stone, which is used by the natives in that quarter as a pigment, and sent for a specimen of it, but the individual I commissioned has not yet arrived. A person who was returning from that country the other day with a collection of specimens, was unfortunately robbed of every thing he had. Were the Huzarehs any other people, I should conclude from the description of the mineral that was given, and their manner of using it, that it was cinnabar, but they are such a perfectly rude and ignorant race, that I fear it will be found to be simply the red oxide of iron. Should gold dust be ever collected on the great scale, or veins of the precious metals be discovered and worked in this country, a mine of quicksilver would be of great importance for the necessary amalgamation works; but this is at present a very vague speculation.

I have mentioned the existence of copper in the Ghilzye and Huzareh territories, Copper. specimens also from Bagour have come under my notice.*

Lead seems to abound in the Huzareh districts, in Ghorabund of Kohistan, and in Lead. Wurduk. The lead of the former two is of an excellent quality, the latter is inferior, and of a harsher character. The ore is the sul-

* The price of lead in Cabool in time of Dost Mahomed Khan was Rs. 1½ per Cabool seer, at present it sells for Rs. 3.

phuret of lead, and that which I have seen from the Huzareh country, occurs in the form of the carbonate likewise. Lead is also stated to be found in Bungesh, and a specimen of it from the Sufued Koh has been brought me lately.

With regard to antimony, I find that what is sold in the bazar of Cabool as such Antimony. is a sulphuret of lead. Occasionally, perhaps, a proportion of antimony may be combined with it, forming what is called the sulphuret of lead and antimony.

I could not convince a vender of antimony, upon one occasion, that what he brought me as pure specimen of that mineral, was not so in reality, until I submitted a fragment of it to the action of the blowpipe, and on disengaging the sulphur, showed him what excellent lead was produced. Having at the time a small piece of massive sulphuret of antimony in my possession, and which, to the eye of the antimony dealer presented very much the same external character as his own, I then placed a fragment of it in the flame of the blowpipe, and the antimony immediately melted, and was absorbed by the charcoal, giving off the white fumes peculiar to it, and no trace of lead was observed.

That antimony, however, exists in this country, is beyond a doubt. It is mentioned in the report of the late Dr. LEARD on Ghorabund as occurring in that district, and I myself saw in the possession of an officer, a mass of pure antimony, which was found in the neighbourhood of Quetta.

Graphite, or plumbago, is a production of this country. I have a specimen of it, Plumbago. reported to be from the vicinity of Kohi Daumun.

Specimens of sulphur have been brought me from the Huzareh country, and it is Sulphur, &c. reported as occurring there in vast quantity. Saltpetre is produced abundantly from the soil. Rock salt I observed in the hills near Jelalabad by the Soorkhah river, but in too small quantity to be worth working; a sample of it from Altamoor also has been sent me, but I do not suppose it is in sufficient abundance there, to be of any consequence. Marble occurs at Mydan, and probably in many other places, but this and gypsum, and minerals of that sort, it will be time enough to direct attention to, when the country has made sufficient progress in the arts, to render them objects of value for economical purposes.

The most important minerals of Northern Afghanistan, are the following:—

Iron. This mineral is found in many parts of the country, particularly in the Huzareh, the Ghilzye, the Bajour, and the Wuseeree territories.*

Lead is found in the Huzareh districts, in Wurdak, and in Kohistan.

Copper is found in the Huzareh, the Ghilzye, and Bajour territories.

* In Captain HERBERT's report on the minerals of the Himalaya, published in the 18th volume of the Asiatic Researches, he makes the following observation in his account of the lead mines:—"A singular fact is, that the ore and reduced metal sell by weight for the same price at Kalsi, the nearest town. I could not learn the reason of this, but suppose that the produce of sulphur pays the expense of reducing the ore." When I read this, I suspected there might be a portion of the ore, known to be argentiferous; but it is evident that the purest is selected at Kalsi as at Cabool, and sold under the general term of *soorma*, or antimony.

Gold is found in several streams north of the Cabool river.

Coal is found in the Huzareh, the Ghilsye, and the Wuzereeh districts.

Sulphur is found in the Huzareh districts.

Here then are materials for commencing the work of civilization in this rude and barbarous region, giving a stimulus to its commerce, increasing its revenues, and affording employment to its indigent, but hardy and industriously inclined population.

A remark has been made, that "the mountains in this world no doubt abound in mines, but that the people must be enlightened before they can be worked." And in what way might I ask, is this period of enlightenment to be brought about? Are these great mineral repositories intended to lie idle in the meantime, to form merely the subject of a scientific theme, and furnish a few specimens for the cabinets of the curious—or, are they designed by an unerring Hand for the great moral end, not only of administering to the immediate wants of the people, but in their very extraction to be the means of exercising their energies, mental as well as physical, improving their habits, and thereby contributing effectually to raise them from the brutal condition into which they have fallen?*

Let this nation be taught the practical manual arts, so as to enable them to turn the productions of their country to account,—let the hand of the Afghan, under the eye of the European, unlock that wealth which is intended for his use,—then may we expect to see the rays of civilization break in upon the moral and intellectual gloom which pervades this darkened land.

* In a casual conversation I had lately with the intelligent Baruksye chief I have alluded to (Oomzen Khan) he observed :—" If the feeling of the English people towards this country be as you describe it, and its various resources receive that attention which it is out of the power of my own countrymen, from their poverty and ignorance to bestow on them, then not only will Cabool become happy and contented, but surrounding nations, on seeing the prosperity of Cabool, will desire of themselves to come under the protection of the English."

Opening of the Topes at the Caves of Kanari, near Bombay, and the relics found in them. By DR. JAMES BIRD.

The Caves of Kanari, situated on the island of Salsette, and two miles beyond the village of Tulsi, are distant twenty miles from the fort of Bombay, and six from Tannah. The made road from Bombay conducts the visitor as far as the village of Vihar, four miles north of which is the mountain where the caves are excavated. They have been described by several travellers, and are noticed, in A. D. 399, by the Buddhist priest and pilgrim "Ea-Hian," who visited the seats of his religion in India, and whose travels have been translated by M. Remusat. The cavern temple is described by him to consist of five stories, each story containing numerous chambers or cells, cut out of the solid rock, and tenanted by Arhats; a description which answers very closely to the circumstances of the Kanari excavations, which rise from the base to the summit of the mountain in six stories, and are connected to each other by steps cut in the solid rock. The kingdom in which they are situated is said to be distant from Kia-shi or Varanasi, two hundred *yojans* to the south, and is called Ta-thsen Dach-chin.

Immediately in front of the large arched cave, and on a ledge of the mountain, some thirty or forty feet below, there are several small *Thopas*, or monumental receptacles for the bones of a Buddha, or Rahat, built of cut stone at the base. These were once of a pyramidal shape, but are now much dilapidated, and appear like a heap of stones. Several years ago I thought of opening some of them, in expectation of obtaining coins or other relics; but found no favorable opportunity until lately, when several lengthened visits, in company with Doctor Heddle, gave me the desired means of doing so. The success of General Ventura, M. Court, and others, in their search after relics from the *topes* of the Punjab and Kabul, gave me additional hope that I should find something worthy of the labour, and I am glad to report, that these expectations have not been disappointed.

The largest of the *topes* selected for examination, appeared to have been one time between twelve or sixteen feet in height. It was much di-

lapidated, and was penetrated from above to the base, which was built of cut stone. After digging to the level of the ground and clearing away the materials, the workmen came to a circular stone, hollow in the centre, and covered at the top by a piece of gypsum. This contained two small copper urns, in one of which were some ashes mixed with a ruby, a pearl, small pieces of gold, and a small gold box, containing a piece of cloth; in the other a silver box and some ashes were found. Two copper-plates containing legible inscriptions, in the *Lath*, or Cave character; accompanied the urns, and these, as far as I have yet been able to decypher them, inform us, that the persons buried here were of the Buddhist faith. The smaller of the copper-plates bears an inscription in two lines, the last part of which contains the Buddhist creed inscribed on the base of the Buddha image from Tirhut, and on the stone extracted from the *Tope of Sarnath*, near Benares; an excellent commentary on which will be found in Mr. Prinsep's Journal for March and April 1835. The last part of the Kanari inscription, and the copper-plate of which I have now the honor of laying before the members of your Society, corresponds very closely with the text of the inscription from Tirhut. The original in the *Lath* character stands thus :

Yé dhaurmá hetu prabhavá, tésham hétu Tathagatá suvacha Tésáncha
yo nirodha évam Vádí Máhá Suwanna :

which transferred to Devanagrí

बेधर्महेतुमभास्तेषां हेतुस्तथागतः । सुवाचतेषां निरोध एव
वादी महासुवर्णः ॥

may be translated :—“ Whatever meritorious acts proceed from cause, of these the source *Tathágata* (Buddha) has declared; the opposing principle of these the great One of exalted birth, has also demonstrated.’

The only difference between the text of the present inscription and the one from *Tirhut*, is the last word *Suwanna*, the *Pali* for *Suvarna* instead of *Sramana*; and which means the *golden one*, or *one of an exalted birth or tribe*, and is here evidently an appellative of Bhuddha. In the appendix to Mr. B. H. Hodgson's quotations in proof of his sketch of

Buddhism, one of the principal attributes of Adi Buddha is सुवर्णवर्णता *Suvarna-warnata*. The above sentence, as Mr. Hodgson remarks, contains the *confessio fidei* of the Buddhaist, and is in the mouth of every one at Kathmandu. The discovery of it at Kanari confirms an opinion long prevalent, that the cave temples of Western India are exclusively *Bauddha*, and seems to strengthen the theory regarding the origin of the *Dékgopes* of Kanari, *Manikyala*, and Afghanistan, that they are *Bauddha* Mausolea, built over the remains of persons of this faith, either of a royal or priestly character. Little doubt can exist of the ashes found in the two copper urns being those of the persons buried, one of whom, according to the larger copper inscription, was the chief of the great *Vihar*, or large arched temple at Kanari. The object of these monuments was, as Mr. Prinsep says, twofold: a memorial of the dead, and in honour of the deity, of which the enshrined saint was only a portion, and as legitimately entitled to be worshipped as the source from which he had emanated, and to which, according to their creed, he could after a life of virtuous penance and abstraction return. The monuments in the *Punjab* and *Cabul* appear to be consecrated tombs of a race of princes, who were of the Buddhaist faith; whose coins are inscribed on one side with Greek letters, and the other with those of Bactrian *Pali*, and whose tribe is called *Khoranon*. They were a Græco-Indo-Scythic race, mentioned by Marco Polo, and called by him *Karahunas*, a tribe of robbers who scoured the country, and plundered every thing within their reach.*

I abstain now from offering any remarks on the general prevalence of the Buddhaist faith on this side of India, or its connexion with the worship of the sun, as my only object is to bring to notice the relics found at Kanari, and their similarity to those discovered in the Punjab.

* Travels of Marco Polo by Marsden, page 86.

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THE
TILDE FOUNDATIONS
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Literal Translation.

Salutation to *Sarvagna*, (a *Jine* or *Boud'dha*, or deified sage peculiar to those sects.)

This was founded in the year of the reign of the *Trukudaka* line about 100 years at *Bardhamanu*,* 54 on the north, and 85 at *Maha Behar*, by *Pushya Burma*, whose habitation was in the northern forest of the conquered *Taromi*, and who, by his personal beauty, was possessed of a *Buddhistical* appearance as a *Chaitya*,† in honor of the most powerful, very wise, and superior *Bhagavana Sakya, Muni*, whose acts were wonderful, and who was the son of *Sārad'dhati*, for the purpose of his studying and practising with firm devotion the famous *Boud'dha* religion, the duty of a learned man.

So long as the revolving waves wherein the *Makara*‡ are swimming at night, the milky water of the *Kshīra Samudra*, (sea of milk,) the *Meru* with its abundant gold and the forest of mangoe—the deep rivers continuing to flow with their clean streams will endure, so long this deed of *Pushya*, which contributes to the advancement of devotion, is durable.

NOTE.—I have most unwillingly kept back Dr. Bird's paper for many weeks, intending to publish it together with a notice of the late Lt. Pigou's Discoveries at Buhurabad near Jullalabad, on the frontier of Afghanistan. I thought the almost simultaneous examination of a *set of topes* situated close to a *set of caves*, giving similar results nearly at places so distant as Buhurabad and Kanari, worthy of being placed in juxta-position, as of interest to the investigator of Boodhist antiquities. I am extremely sorry that great delay in the preparation of a simple lithograph to accompany the Buhurabad paper should have caused the suppression of this interesting paper for so long a time. Having heard a few days ago from Dr. Bird, with the promise of a translation of the inscription on the two copper plates dug from the *Dehgop* at Kanari, copy of which accompanied his paper, I determined on publishing the reading of one of them (subject to correction by Dr. Bird) as given by Pundit Kamalakanta Vidyalanka, and the literal translation of that reading, which I owe to a native gentleman of much learning and intelligence, Baboo Neelratna Holdar of Calcutta. The inscription is numbered xxviii. (and so copied erroneously into the lithograph,) in a work shortly, I am happy to say, about to appear on the Excavations in Western India, originated by Mr. Wathen, well known as a Sanscrit scholar, and carried on by Dr. Bird.



* This country is also mentioned in the 25th *stoka* of the *Pratāpa Rudra* inscription, vide Asiatic Journal, No 82, 1838, page 906.

† Place of religious worship. This, if the word *druma* be added to it, means a sacred tree.

‡ A horned fish, or a fabulous animal.

Note on a Copper Land Grant, by JAYA CHANDRA.

The copper plate whence the accompanying reading in modern Sanscrit character and translation are taken, was found near Fyzabad in the Oude, and a facsimile of it was forwarded to me by Lieut. Col. Caulfield, then Resident at Lucknow. The land grants of the donor, Raja Jaya Chandra, are not uncommon. In the first volume of the Transactions of the Asiatic Society there is a notice by the late Mr. Colebrooke, (p. 441,) of a grant by this Raja, which is however described at second-hand : " Without having seen the original," says Mr. Colebrooke, " no opinion can be offered as to the probable genuineness of this monument ; (date s. 1220, A. D. 1164) the inscription is however consistent with chronology ; for Jaya Chandra, who is described in the *Ayeen Acheri* as supreme monarch of India, having the seat of his empire at Canouj, is there mentioned as the ally of Shehabuddin in the war with Prithair Raja, or Pithora, about the year of the *Hajira* 588, or A. D. 1192 ; twenty-eight years after the date of this grant."

The date of the grant now published is s. 1243, or A. D. 1187, twenty-three years subsequent to that of the same monarch noted by Mr. Colebrooke, and only six years prior to the death of the ill-fated donor, which occurred A. D. 1193. With him expired the dynasty of the Rahtore princes of Canouj.

The genealogy, as given in the grant now before us, differs only in the name of the first ancestor mentioned from that found in Mr. Colebrooke's grant. The name is there *Sripala*, here *Yasovigra*, but the identity of the monarch, known under these different appellations, has been already ascertained, and admitted by the highest authorities, (*As. Soc. Jour.* vol. iii. p. 339).

The phraseology of this grant is not different from those of Jaya Chandra, which have been already discovered : the anathema against the resumers of land granted in free tenure is remarkable for its peculiar bitterness. The plate, judging from the facsimile, must be in high preservation, and the date it gives is valuable, as bearing corroborative testimony to the accuracy of chronological data.

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सुस्ति ॥ अकुष्ठोत्कण्ठ वैकुष्ठ कष्टपीठसुठत्करः । संरम्भः
सुरतारम्भे स त्रियः त्रयसेस्तु वः ॥ आसीदसीतद्युतिवंशजातस्मा
पाशमाशासु दिवंगतासु । साक्षादिवस्वानिव भूरिधाम्ना नाम्ना
यज्ञोविषह इत्युदारः ॥ तत्सुतोभून्महीचंद्रसुद्रधामनिभं निजं । ये
नापारमकूपारपारे व्यापारितं यज्ञः ॥ तस्याभूत्तनयो नवैकरसि
कः क्रान्तद्विषन्मण्डलो विध्वस्तोद्धतवीरयोधतिमिरः श्रीचंद्रदेवो
नृपः । येनोदारतरप्रतापशमिताशेषप्रजोपद्रवं । श्रीमत् गाधि
पुराधिराज्यमसमंदोर्विक्रमेणार्जितं ॥ तीर्थानि काशिकुशिकोत्तर
कोशलेन्द्रस्थानीयकानि परिपाशवताधिगम्य । हेमात्मतुल्यमनिजं
ददताद्विजेभ्यो यानांकिता वसुमतीशतश्चस्तुषाभिः ॥ तस्यात्मजो

मदनपाल इति क्षितोद्भूतामणिर्विजयते निजगोचरं चन्द्रः । यस्या
 भिवेककलशोद्भूतैः पयोभिः प्रक्षालितं कलिरजः पटलं धरि
 ष्याः ॥ यस्यासीद्विजयप्रमाणसमये तुङ्गैर्वलैर्वैश्वान् माद्यत् कुम्भि
 पदक्रमासमभरद्भुवन्महीमण्डलेचूडारत्नविभञ्जितालुगलितस्थानासु
 गुह्यसितः श्रेयः स्पर्शश्चादिव क्षणमसौ क्रोडे निलीनाननः ॥
 तस्मादवायत निजो दतवाञ्जवस्त्रिवन्धावनद्धनवरान्धगजो नरे
 ऋः । सांद्राढृतद्रवमुखां प्रभवो गवां यो गोविन्दचंद्र इति चंद्रइवावु
 राज्ञेः ॥ नकथमप्यसभंतरणक्षमांक्षिसृषु दिक्षु गजानन्य वक्षिणः ।
 ककुभिवभ्रमुरभ्रमुवल्लभ प्रति भटा इव यस्य धरागजाः ॥ अजनि
 विजयचन्द्रोनाम तस्मान्नरेन्द्रः सुरपतिरिवभूभृत्क्षविच्छेददक्षः ।
 भुवनदलनहेलाहर्महम्बीरनारी नयनजलजधाराधौतभूषीकता
 पः ॥ लोकत्रयाक्रमणकेलिविसृंखलानि प्रख्यातकीर्तिं कविबर्णित
 वैभवानि । यस्य त्रिविक्रमपदक्रमभाजयंति प्रद्योतयंतिकांलि राज
 भयं यशांसि ॥ यस्मिंश्चलत्युदधिनेमिमहोजयार्थमाद्यत्करीन्द्र
 गुहभारनिपीडितेव । याति प्रजापतिपदं शरणार्थिनी भूस्तद्गुर्तुरंग
 निवहोत्थरजच्छलेन ॥ तस्मादद्भुतविक्रमादथजयचन्द्राभिधानः पति
 भूपानामवतीर्ण एष भुवनोद्वारायनारायणः । द्वैधीभावमपास्य विग्रह
 रुचिं धिक्कृत्य शान्ताशयाः । सेवन्तेयमुदयवंधनभयध्वंशार्थिनः
 पार्थिवाः ॥

मच्छेन्मूर्त्तामतुच्छां न यदि कवचयेत् कूर्मपृष्ठाभिघातः प्रत्यावृत्त
 अमार्तो नमदखिलफणश्वासवात्यासहस्रं । उद्योगो यस्य धावद्भुर
 क्षिप्रधुनीनिर्भरस्फारधारभ्रस्यद्भानद्विपालीवहनभरगलद्वैट्य
 मुद्रः फणोद्भूः ॥ सोयं समस्तराजचक्र संसेवितचरणः सच परम
 भट्टारक महाधिराजपरमेश्वरपरममाहेश्वरनिजभुजोपार्जित
 श्रीकायकुब्जाधिपत्यश्रीचन्द्रदेवपादानुध्यातपरमभट्टारक महा
 राजाधिराजपरमेश्वरपरममाहेश्वरश्रीमदनपालदेवपादानुध्यात
 परमभट्टारकमहाराजाधिराज परमेश्वर परममाहेश्वरा इह
 एति गजपति नरपति राज त्रयाधिपति विविधविद्याविचार
 वाचस्पति श्रीगोविन्द चन्द्र देव पादानुध्यात परम भट्टारक महा
 राजाधिराज परमेश्वर परममाहेश्वराश्चपति गजपति नरपति
 राजत्रयाधिपति विविधविद्याविचारवाचस्पति श्रीविजयचन्द्र

देवपादानुध्यात परम भट्टारक महाराजाधिराज परमेश्वर पर
ममाहेश्वराश्वपति गजपति नरपति राजश्याधिपति विविधवि
द्याविचार वाचस्पति श्रीमज्जवचन्द्र देवो विजयी ॥ असुरेश
पत्तनायां केमलीयामनिवासिनो निखिल जनपदानुपगतानां
राजराजो युवराज मन्त्रिपुरोद्भूत प्रतीहार सभापति सांघामि
काख्यपटनिक भिषङ्गनैमित्तिकान्तः पुनिक्रूत करितुरगपत्तना
करस्थान गोकुलाधिकारिपुत्रधानाज्ञापयति बोधयत्यादिश्रुति
च विदित मस्तु भवतां । यश्चोपरि लिखितयामः सखल स्थल स
खौहलवणाकरः समस्त्यकरः सगतेष्वर सगिरिगहन निधानः
समधूकात्मवाटिकाविटपतृणापतिगोचरपट्यन्तः सोर्द्धाधश्चतु रा
घाटविशुद्धः श्वसीमापट्यन्तः चित्तवारिंशदधिकद्वादशशत स
म्वत्सरे आषाढे मासि शुक्लपक्षे सप्तम्यान्तिथौ रविदिने अंकतो
मपि सम्वत् १२ ४२ आषाढसुदी ७ खौ अष्टौ श्रीमहाराणास्वां
गंगायां स्नात्वा विधिवन्मन्त्रदेवमनि मनुजयुत पितृगणास्तर्पयि
त्वा तिमिरपटलपाटलपटुमह समुध्म, रोचिष मुपस्थायौषधि
पति सकलश्रेष्ठं समन्वयचर्च्य चिभुवनचातुर्भगवतो वासुवस्य पूजां
विधाय प्रचुरपायसेन हविषा हविर्भुजं कृत्वा मातापितो रात्मन
श्च पुण्ययज्ञोभिवृद्धये ॥

अम्भोभिराचम्य कुञ्जलतापूतकरतलोदकस्यर्चकभारद्वाजगोत्राय
भारद्वाजाङ्गीरसवार्हस्पत्येतिषिप्रवराय राजतश्रीअटलपौत्राय
राजतश्रीइन्द्रपुत्राय औडराजतश्रीअनङ्गाय चन्द्रार्कयावष्कास
नीकृत्य प्रदत्तो मया यथादीयमानकरकरपूरनिकप्रभृतिनियतानि
यतसमस्तआज्ञाविधेयीभूषदास्यनीतिभवन्ति चाचक्षोकाः ॥

भूमिं यः प्रतिगृह्णाति यस्य भूमिं प्रयच्छति ॥ उभौ तौ पुण्यक
र्मणौ नियतं स्वर्गगामिनौ ॥ श्रद्धं भद्रासनं च्छत्रं वराशवा वरवार
णाः ॥ भूमिदानस्य चिह्नानि फलमेतत् पुरन्दर ॥ षड्विधसहस्रा
णि स्वर्गे वसति भूमिदः ॥ आच्छेत्ता चानुमन्ता च तान्येव नरके
वसेत् ॥ वज्रभिर्वसुधा भुक्ता राजभिः सगरादिभिः । यस्य यस्य यदा
भूमिस्तस्य तस्य तदा फलम् । स्वदत्तां परदत्ताम्वा यो हरेत् वसु
न्धरां । स विष्ठायां क्रिमिर्भूत्वापितृभिः सह मज्जति । तडागानां
सहस्रेण वाजपेयज्ञेन च । गवां कोटिप्रदानेन भूमिहर्ता न मुञ्चति ।

वारिहीनेष्वरक्षेषु शुष्ककोटरवासिनः । ह्यष्टाद्वयाश्च जायन्ते
 देवब्रह्मस्वहारिणः । न विषं विषमित्याहुर्ब्रह्मस्वं विषमुच्यते । विष
 मेकाकिनं हन्ति ब्रह्मस्वं पुत्रपौत्रिकं ॥ वाताभ्रविभ्रममिदं वसुधा
 धिपस्यमायातमाचमधुराविषयोपभोगाः । प्राणास्तृणायजस्रविंदुसमा
 नराणां ॥ धर्मः सखा परमहोपरलोकयाने । यानीह दत्तानि पुरा
 नरेन्द्रैर्दानानि धर्मार्थयज्ञस्कराणि । निर्मास्यवान्तप्रतिमानितानि
 को नाम साधुः पुनरादहीत ॥

Literal Translation, by Pundit SARODHA PRASADH.

1. May the embrace of Lakshmi, (* * * * * and Vaikuntha,) contribute to your prosperity !

2. The Rajas who were descended from the *lunar* line having departed for heaven, one, named *Yasóvighraha*, by his natural spirits was as the sun himself.

3. His son was *Mahi Chandra*, who extended his fame as beams of the moon across the sea.

4. His son was *Chandra Deva*, who was exceedingly given to justice, who invaded the whole circle of his enemies, and dispelled the darkness of the gallant warriors. He, by the power of his arms, gained the kingdom of *Gádhipoora*, where all sorts of insurrections have been quelled by his power.

5. He, (*Chandra Deva*,) who protected the sacred places of *Kashi*, (Benarus,) *Kushikotsava Kóshalá*, (Oude,) and *Indrasthána*, possessing them, who constantly gave gold equal to the weight of his body to the *Bráhmanas* ; made the *Vasumati*, (earth,) renowned by the hundreds and hundreds of *túlás*.*

6. His son *Madanapála*, who was like the moon in his line, and the crest-jewel of all the Rajas, was glorious ! By the water of his anointment, all the filth of the *Kaliyuga* has been washed away.

* A religious ceremony, i. e. giving gold or silver to the *Bráhmanas*, equal to the weight of the donor's body ; the ceremony is in these days often practised by weighments against grains, or precious merchandise. It is supposed to be efficacious in awarding evil, and was constantly had recourse to by Maharaja Runjeet Sing, (Lahore,) in his last illness.

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7. At the time of his expedition for conquests, when the earth was as it were crumbling under the over-passing of his furious elephants, as well as his mighty army, the mouth of *Sesha*,* smeared with blood gushing from the palate pierced by the pressure with his head jewel, was for sometime bent down even to his breast.

8. From him was born *Gobinda Chundra*, like the moon rising from the sea, who by his arms, long and like the creeping plant, kept the newly, acquired kingdom—stubborn as the elephant in confinement; nay, who granted a great many cows yielding sweet milk.

9. His elephants, rivals to that of *Indra*, having sought in vain in the three quarters of the world for elephants, capable of bearing their burdens, came at last in the quarter of *Indra*, (east,) and wandered there-along.†

10. From him was born *Raja Vijaya Chandra*, who like *Surapati*, (Indra,) cut off the *Pukshus* of all the *Bhúbhrit*‡. He at his easy conquest of the world, has extinguished the heat of the earth by the abundant tears of * * * *

11. His renown challenging the three regions of creation described by eminent poets, and which reached as far as the *Vishnu loka*, (region of *Vishnu*,) has been ever the terror of *Vali Rajá*.§

12. The earth, at the expedition of *Vijaya Chandra* to conquer the whole world crushed by his furious elephants, ascended, as it were, in the dust caused by his numerous army, to solicit refuge from *Prajápati*, (*Brahmá*.)

13. From him who was possessed of wondrous power, sprung one named *Jaya Chandra*, the lord of all *Rajas*, who was as the *Náráyaṇa* himself, born only for the deliverance of the world; and whom the *Rajas* humbling themselves ceased from contemplating hostilities with, and putting a stop to their designs, submitted to.

14. At the preparation of his warlike affairs, the *Phanindra* (the chief of serpents,) wearied with falling down and again rising from the hard shell of the *Kúrma*,|| under the pressure of his elephants the ichor from whose temples dropped into the streams, running from the

* The chief of serpents, supporting the earth on his head.

† With the view of finding there the rival elephants of *Indra*.

‡ The word *paksha* means when relating to *Indra* the “peaks of mountains;” and “allies” when referring to the *Raja*. The word *Bhúbhrit* has also a double meaning, “the mountain” and “the (other) *Rajas*.”

§ *Vali Raja*, v. the *Srimat Bhágavata*.

|| The tortoise supposed to reside underneath the earth.

shaking hills, and panting from his thousand hoods with impatience, would without sustenance have fainted, and died.

He, the glorious *Jaya Chandra*, whose feet were adored by the circle of Rajas, and who was like *Vachaspata** in discussing on various *Vidyás*, (sciences,) the lord of the three Rajas: viz., *Aswapati*, *Goyapati*, and *Narapati*, very rich, king of kings, learned and superior to all, and who was devoted to the feet of (his father) *Vijaya Chandra*, who also was like *Vachaspati* in discussing, &c. and devoted to (the feet of his father) *Govinda Chandra*, who also was, &c. and devoted to the feet of (his father) *Madanapála*, who also was, &c. and devoted to the feet of (his father) *Chandra Deva*, who was also very learned, king of kings, &c. &c. and who gained the kingdom of Kanyakubja by the power of his arms. That proclaims and orders to all the inhabitants of *Kemali*, the village situated at *Ashúreshapattaná*, to all the rajas, princes, ministers, priests, attendants, chiefs of assemblies, warriors, (*akshapálalikas*) physicians, and servants, who were occasionally to attend to the female apartments, superintendents of elephants, horses, mines, cows, &c.

Be it known to all of you, that this day, the seventh day of the moon, in the month of *Ashádha* of *Samvatsara* 1243, we, for promoting the virtue and fame of our parents and ourselves, having performed ablution in the Ganga at Benares,—satisfied as usual, the *Gods*, *Mûnis*, men, together with deceased ancestors, with offerings of water, adored him whose fervid beams dispel darkness, worshipped him who wears the crescent on his forehead (*Shiva*), and *Vásudeva* (*Vishnú*), offered oblations to *Hútáshana* (Fire) with *Páyasha†* and performed *Achamana* with water, then granted with water in hand to *Alonga Ouda Ráyuta*, who belonged to the *Bháraddája* line, and was possessed of three Provaras, viz. *Bharaddája*, *Angirasa*, and *Várhaspatya*, and who was the son of *Indra Ráyuta*, and grandson of *Atala Ráyuta* with a *Sáshna*, (grant) village above-mentioned (*Kemali*) which was enriched with water and earth, with mines of iron and salts, with ponds full of fishes, with caves and fertile farms, mountains and forests, with gardens of modhu and mango trees, and which extends as far as *Trinayuthi*, and the four boundaries of which were undisputable. It is ever to be enjoyed so long as the sun and moon will endure. Its revenues, as settled, or are to be settled, are duly to be discharged by the tenants.

* The Guru of the Gods.

† Rice boiled with milk and sugar.

Slokas.—He who grants lands, and he who accepts, both of those virtuous reside in heaven.

O, *Purandara*, (Indra.) *Sankha* (shell) houses, ensign of ranks, (chattah) fine horses and elephants, are gained by granting lands.

He who grants lands lives 60,000 years in heaven; but he who confiscates, or resumes, or allows others to do so, is doomed to hell for a like period.

The earth has been enjoyed by many kings, as *Ságara Raja*, and others, and he who rules it in his turn is the sole enjoyer of its fruits.

He who resumes lands granted by himself or others, is to become a dung fly and to live therein with his ancestors.

The resumer of lands can never be free from sins, though he grants a thousand tanks, a crore of cows, and performs a hundred *vajapeya* (a sacrifice.)

Those who resume lands granted by others, will become black serpents in the desert of the forest of the *Vindhya* mountain. No poison is of itself utter poison; but to deprive a Brahman of his property is indeed poison, because the former can kill one alone, but the latter the whole of a man's descendants.

Sovereignty is unstable like the wind; worldly pleasures are in the first instance desirable. The life of man is as a dew-drop on the grape, but, alas! virtue is the only friend who accompanies him into the next world.

But what generous man will resume the grants made by Rajas, who have gone before him, and whose gifts are like wreaths of flowers spreading the fragrance of a good name and of a reputation for wealth and virtue?

Lineage of Jayachandra.

Yashovigraha.

|

Mahichandra.

|

Chandra Deva.

|

Madanapála.

|

Gobindachandra.

|

Vijayachandra.

|

Jayachandra,
the donor.

JOURNAL

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Abstract Journal of the Route of Lieutenant A. Cunningham, Bengal Engineers, to the Sources of the Punjab Rivers.

From Tandee on the Chundra Bhaga river, where I parted with Lieutenant Broome, I continued my way along the right bank of the river, with the proud consciousness that I was the first European who had ever visited that part of the Chundra Bhaga. On the 16th of July, 1839, at sixteen miles below Tandee, I crossed the river by a wooden bridge called *Rocha*, or the 'Great' Bridge, 85 feet long and 43 feet above the stream, to the left bank, where I once more came upon fir trees which I had not seen for a week. After a walk of two miles over a dusty bad pathway, I had to climb a steep hill on which the celebrated temple of Triloknath is situated. On the road I passed a Hindoo Pilgrim, a Gosain, who had come from Sunam in the protected Sikh States, having visited Jwala Mookhee near Kangra, and the various hot wells at the head of the Parbuttee river.

The temple, which is situated at one end of the village of Goonda, is square, and is surmounted by the *trisol* or trident of Siva, who is Triloknath, or, The Lord of the three worlds, Heaven, Earth, and Hell. There was an open Court to the front with a two-storied verandah of wood; the pillars, architectraves, and rails being all richly carved. In the middle of the Court there was a block of stone about 6 feet square by 5 feet high, on the top of which was growing the sacred plant *Toolsee*, or Basil. The figure of Triloknath was of white marble, about two feet

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high, with six arms ; on its head there was placed a small squatted Buddhistical looking figure which the attendant Brahmin declared to be of Anna Pooroos, probably meaning Anna Purna, the beneficent form of Parvati, the wife of Siva. In the Court there were many tall poles surmounted by cow's tails and pieces of cloth, placed there as offerings, by Tibetan Buddhists as well as by Brahminical Hindoos.

The village of Toonda in which the Temple of Triloknath is situated, had been overwhelmed in snow in the preceding year, 1838, when all the houses which had not been bonded with wood, had fallen down, and killed the inhabitants. The Rana or Chief of Toonda Triloknath is under the authority of the Rajah of Chumba, to which state the lower portion of Lahul belongs.

The province of Lahul embraces the whole breadth of the Chundra and Bhaga rivers, and extends down their united streams called the Chundra Bhaga in a W. N. W. direction to about ten miles below Triloknath. It is divided into two unequal parts ; the larger belonging to the state of Kooloo, and the smaller to Chumba. In the former there were 108 villages, containing 740 houses, and 3,764 inhabitants.

The revenue of the province is derived from two different sources ; a house tax, and a duty on the carriage of merchandize. Under the Rajah's administration each house was taxed at 10 and 12 rupees, but the Sikh Government increased the tax to twenty rupees per house, by which they raised the collections from 5,000 to 10,000 rupees per annum, the houses of the priests and poorer labourers being exempted from taxation. The rates of toll were at the same time adjusted by Zurawur Singh, the governor of Ladakh, the duty upon each carriage sheep being raised from half an anna (or three farthings) to four annas, (or six pence.) This was considered very oppressive by the people, but as a sheep can carry 8 and 10 seers, or one fourth of a man's load, the fair and natural rate of duty would be to charge one fourth of the duty levied upon each man ; and Zurawur Singh did no more, for a man is charged one rupee. On a pony which carries from 60 to 70 seers, or double the load of a man, the duty levied is likewise double or two rupees per pony.

The grain raised in Lahul is all consumed in the country ; and as there are no natural productions, the house tax is paid by the inhabitants from the joint Stock, obtained by hiring themselves as porters between the states in the lower hills of the Punjab and Ladakh ; the porters who bring goods from Kooloo, Mundee and Chumba being changed at Tandee for natives of the province itself, who receive 6 rupees cash, for the journey to Ladakh. The hire of a pony to Ladakh is 12 rupees.

The articles taken to Ladakh are :—wheat and rice from Chumba ; Iron and Opium from Mundee ; coarse white cottons, and Benares brocades of the worst quality from Kooloo ; with goats skins dyed red, chiefly manufactured at Bissowlee and Noorpoor in the Punjab—in exchange for which the following articles are brought to Tandee to be sold to the merchants of the neighbouring states. Shawl Wool ; Bang, or Hemp prepared for smoking ; silver in wedges, each wedge called Yamoo, weighing 180 rupees or $4\frac{1}{2}$ lbs. avoirdupois ; Borax, native of Ladakh ; Salt, manufactured at some Salt lakes beyond Ladakh ; and Tea, brought from Yarkund.

For the two previous years, however, but little trade has passed through Lahul, on account of the seizure of Ladakh by the Jummoo family, who have established a high road through their own territory of Jummoo, which throws all the duties upon the traffic into their power. The route runs from Jummoo, through Chinénee and Bhudurivar, both in Forster's route to Kishtwar, and thence to Chutogurh and Ladakh. The whole of these places, and consequently the entire route, are in the possession either of Gulab Singh or of his brother, Dheean Singh.

The consequence of this change in the direction of the commerce had been so prejudicial to Lahul, that about 500 people had emigrated to other countries ; and many more would have followed them had they not been stopped at the Custom houses established on all the passes leading from Lahul. Another consequence of this interruption of the traffic had been that very little or no Salt had come to Lahul, for the two preceding years ; and of this the people complained bitterly, as well as of the loss of their hire as porters between the lower hills of the Punjab and Ladakh. Many of them were literally starving, having nothing to eat, except grass, willow leaves, and strawberries. Even the attendant Brahmin of the holy temple of Triloknath was glad to get the remains of my Mahomedan Munshi's dinner.

There are four passes leading from Lahul into Chumba, all of which were described as equally bad. Of these the Dogee Pass leads from the village of Ruppoo, about 8 miles below Tandee, over the snow, and down the course of the Boodhil river to Burmáwar. The other passes lead from Triloknath. The upper one is called the Bugga Pass and leads direct to Burmáwar ; the lower is the Humguree Pass, and is very little used, and the middle is the Kalee Joth, or Pass of Kalee Débee, which I chose.

On the 18th of July, I quitted Triloknath, and on the following evening reached the foot of the Kalee Débee Pass, so named from a

black conical peak to the South, dedicated to Kálee Débee. The place was called Hoolyas, in Sanskrit Hoolyasaca, and was merely a resting place at the foot of the pass; there I shot some snow pheasants and Alpine Hares. On the following morning I began the ascent of the pass up steep banks of loose angular masses of rock, and over sloping snow beds, down which fragments of rock came bounding and dashing along with a crash like the rattling of continued and numerous file-firing. The porter who carried my iron tentpegs was struck on the knee by one of these stones, and hurled before my eyes down the sloping indurated snow. Luckily the snow bed terminated in a fork between two mounds of broken fragments of rock, and there the man's further progress was stopped, and his life saved. He was lame however for three weeks afterwards. The crest of the pass was a narrow ridge not more than ten and twelve feet wide, covered with soft and newly fallen snow. There I spread my cloak and found by my thermometer that the height was 15,700 feet. In the middle of the ridge there were two small slabs erect and smeared with vermilion, near which were numerous sticks covered with rags. For a few minutes I had a splendid view of the green hills of Chumba smiling in the distance. A thick haze then descended and obscured even the terrific gulph below, and I commenced the descent without seeing where I was to halt for the night. A goat was sacrificed by my servants to the Goddess Kálee, and to that they attributed my safety as well as their own. The descent was 5,000 feet to the spot where I halted, at the head of the Nye river, one of the principal tributaries of the Ravee.

On the 21st of July, I continued my journey, following the course of the Nye river for seven miles to the village of Loondee, below which I crossed the river and halted at the Dhurmsala, or traveller's house. The next day I reached Burgaon, a large village on the left bank of the Nye, and was much cheered with the sight of a mulberry tree; and there I got some good wheat flour, some excellent milk, and fine honey. On the 24th I passed through Footahun, below which the Nye and Boodhil rivers join the Ravee, to Poolnee; and ascending the Boodhil river for five miles I crossed it by a very respectable wooden bridge, 68 feet in length and 98 feet above the river, with a railing, knee high, on each side. There I saw wild grapes and mulberries just beginning to ripen—and continuing my journey for an ascent of 1,500 feet, I reached Burmawar, or Vermmawura, the ancient Capital of the Verma family of Chumba, 7,015 feet above the sea. The spot was a beautiful one; but the severity of the winter had no doubt led to its being abandoned as a capital for

several centuries. The tall spires of the stone temples, and the profusely carved wooden temples were completely shaded by cedar and walnut trees. One Cedar was 20 feet in circumference. There were numerous stone pillars, tradition said 84, dedicated to Siva ; and a large brazen bull, the size of life, under a wooden shed, besides several travellers' houses. The figures in the temples were of brass and exceedingly well executed, all bespeaking a very ancient origin. I copied three Sanscrit inscriptions from the brazen figures, recording the names and families of the donors.

On the 29th of July, I left Burmawur, and at four miles reached the village of Khunn, opposite Tootahun, where the Nye and Boodhil rivers join the Ravee. From thence the road descended for 1,500 feet to the Ravee, which was rushing between steep cliffs of black clay slate ; I crossed it by a birchen rope bridge 116½ feet span and 60 feet above the water : the points of suspension were at different heights, and the fall of the curve in the middle was 20 feet, which made the ascent and descent extremely difficult and dangerous. From the bridge, I had to scramble amongst loose stones, and up steep banks for an ascent of 2,000 feet in a distance of two miles, when I reached Woolas, on the left bank of the Ravee, opposite Khunn and Tootahun, at the junction of the three rivers, which I was surprised to find was not considered holy. The three streams were about equal in size ; but the Boodhil is the one held in most esteem, as one of its sources is in the holy lake of Munnee Muleés—its other principal source is from the Dogee Pass, on the road from Tandee to Burmawur. The Nye River has its principal source in the Kalee Débee Pass ; but a considerable feeder called the Raim River, joins it from the Bugga Pass. The Ravee itself rises in Kooloo from the Bungall Mountain, and runs in a N. W. direction to Woolas, where it is joined by the Nye and Boodhil.

From Woolas, I followed what is called the royal road, or that used by the Rajahs of Chumba when they make their pilgrimages to Munna Muhe's. It was one day's journey out of the way, but as it ascended the higher spires of the mountains, I chose it for the sake of the more extensive view, which I should obtain, and for the sake of the survey, which I was making. In three days, I reached Chaitraree, where was a temple to Sugget Débee. The figure was of brass with four arms ; and on the pedestal was an inscription, recording the donor's name, which I copied. On the next day, I reached Bussoo, and on the following day Mahila ; and on the 4th of August, I crossed the Ranee by a birchen rope bridge of 169 feet long, stretching from an isolated rock on the bank to the Cliff

opposite, and reached Chumba, the Capital of the state of the same name.

Chumba, or Chumpapoor, the Capital of Chumba is situated on a level piece of ground on the right bank of the Ravee, at an elevation of 3,015 feet. There is a tradition that the river formerly covered the Changaun or plain of Chumba; which is certainly correct, for the plain is formed of large boulders of slate and granite, mingled with rich earth above, and with coarse sand below. There are nine good temples in Chumba; none of them, however of such beautiful workmanship as those at Burmawar. The Rajah's Palace is an extensive building, but it cannot boast of any beauty. The houses are not different from those usually seen in the hills; and I was altogether much disappointed with Chumba.

Of seventeen purgunnahs, through which I passed I have a detailed account of all the different villages, amounting to 258, containing 1,672 houses, and 8,849 inhabitants. These seventeen Purgunnahs form about one-eighth of the whole country; which must, therefore contain, with the addition of 800 houses, and 7,000 inhabitants in Chumba town, 14,176 houses, and 77,792 inhabitants. The villages on the lower course of the Ravee are however much larger than those upon the higher streams, and I am therefore inclined to rate the population at nearly 100,000; of whom perhaps 10,000 may be exempt from paying the house tax—the remainder, 90,000, living in 12,500 houses, will give a revenue of 2,50,000 rupees, if taxed as usual at 20 rupees per house.

The trade through Chumba, formerly considerable, is now very little, owing to the opening of the new route, through Jummao; Customs are, however, collected at Bhudewar, which forms the North Western boundary of Chumba, and through which merchants occasionally pass, and merchants who come to Chumba, sometimes carry goods by the Sajah Pass and Chutegurh to Ladakh; but the traffic is comparatively trifling; and I do not therefore value the amount of Customs collected at more than 50,000 Rs. yearly, making a total revenue of 3 lakhs of rupees, or £30,000.

There are no natural productions exported from Chumba, save rice and wheat to Ladakh; and the manufactures are considerable: the principal are thick woollens called Burmawur, manufactured in pieces eleven yards long, and fifteen inches wide, in all the colder parts of Chumba. Some are carried to Kooloo for sale, and I have seen a few pieces at Simla. Coarse Alwans, or Shawl Cloths, are made in the town of Chumba from Ladakh Wool, but they are all used in the country.

The men wear a long sleeved white woollen cloak, fastened round the waist with a black woollen rope; and on the head a peculiar peaked cap

of thick white woollen; the women wear the same cloak, only black, with a white rope round the waist; and a small skull cap on the head—the men's dress is a very picturesque one.

From the Rajah's Pundit I obtained a long list of the Rajahs of Chumba, beginning with Brahma of course, and descending through the Surajvansa to Sumitra, after whom the list appears to be less apocryphal. The earlier Rajahs are said to have resided in Burmawar.

On the 11th of August I quitted Chumba, crossing the Ravee immediately above the town by a birchen rope suspension bridge, of 187 feet span; and with much difficulty made my way to the village of Kurédh. One of my porters in crossing the small stream, now swollen by rain, lost his footing and was drowned. On the 13th I reached the summit of the pass of Chuarhoo, 8,041 feet high, from which I saw the plains of the Punjab indistinctly through the clouds. In the evening I reached the large Village of Chuarhee, where I halted. On the following day I made a fatiguing march of $4\frac{1}{2}$ miles to Jajeree, on the bank of the Chukkee River, over several high ridges of stiff gravelly conglomerate, alternating in strata with sandstone. The next day I crossed the Chukkee River with some difficulty, by swimming. It was 200 feet across and about 5 feet deep in the middle, and the rounded boulders at the bottom afforded no footing whatever; after a little ascent and descent I came upon a large open plain, which I crossed to Noorpoor.

Noorpoor is a fine flourishing city, 1,924 feet in height, built upon a narrow ridge of a sandstone rock, curving to the North; the houses are chiefly of squared stone; and the main street runs over the solid rock. The city was founded upwards of two hundred years ago by the celebrated Noor Jehan, the beautiful empress, who established a number of Kashmerians in it. In 1839 there were said to be 7,000 Kashmerians in Noorpoor, who were chiefly employed in the manufacture of Shawls. I saw many of the Shawls, which were decidedly inferior to the real Kashmerian Shawls, this was attributed to the difficulty of getting the finest wool. The Noorpoor shawls are however of very fair workmanship, and they are brought in great numbers to Simla, Delhi, Lucknow, Benares, and Calcutta.

On the 18th of August I left Noorpoor, and crossing the Chukkee River, I reached Puthankot in the plains of the Punjab at an elevation of 1,205 feet above the sea. From thence I passed through Shujanpoor, a good sized straggling town, and crossing the Umritsir and Lahore Canal near its head, I reached the bank of the Ravee, which was nearly a mile in width. The passage was made in about an hour by boat, and I halted

at a large straggling town called Ruttooa, from that passing through Heeranugur, Chunghee Marhee, Mudwar Harmunder, Rarha, and Pullee, I reached the bank of the Tohi, the Jummoo River which was rushing along deep and red, having been swollen by heavy rain in the lower hills. There I was detained until the evening, as no boatman even with a bribe would venture his boat in the rapid current. At Jummoo I occupied an upper room in a gateway prepared for reception by Golab Singh's eldest son, Oodhum Singh, who was lately killed at Lahore.

The town of Jummoo is about the same size as Noorpoor, but it contains fewer inhabitants, as there are no two storied houses in it. A few Shawls are manufactured at Jummoo, but they are made to order and not for general sale. Rajah Oodhum Singh treated me kindly enough; but my servants were watched, and I was unable to procure any information of value, I therefore quitted Jummoo as quickly as possible, and crossed the Chenab river 10 miles below Aknoor, near where Taimoor had crossed it. The main stream was 920 yards wide, rolling swiftly on with a strong current. There were besides six other channels, some of them breast deep, and all having a rapid stream; and beyond these was the river Tohi, which, rising in the Rutun Punjall mountains, flows by Rajaoree, and joins the Chenab above Wazeerabad. It must have been between this river and the Chenab that Alexander had pitched his camp about the same season of the year; for Arrian says, 'The flat country is also often overflowed by rains in summer, insomuch that the River Acesines, having at that season laid all the adjacent plains under water, Alexander's army was forced to decamp from its banks, and pitch their tents at a great distance.'

The Tohi, frequently also called Toh, is, I have no doubt, the Tutapus of Arrian, a great river, which falls into the Acesines, for the Tohi of Rajavree runs in a direct line upwards of 80 miles, and where I crossed it near Mumaivur, at the same season in which Alexander had seen it, it was a great river running deep and red. It was full of quicksands, and the passage was dangerous as well as tedious. On the 3rd of September I reached Bheembur, at the foot of the mountains on the Royal Mogul road to Kashmere.

On the 5th I proceeded to scale, what Bermier called that 'frightful wall of the world,' the 'Adi Duk' or first range of mountains. On the top of the pass I saw a gibbet with two cages containing the skull of Thums and his nephew, the chiefs of Poonch, who had for a long time resisted the encroachments of the Jummoo family. A price was set upon their heads by Goolab Singh, but from their known bravery no one dared

attack them openly ; and they were at last killed, while asleep, and their heads carried to Goolab Singh, who ordered them to be suspended on the crest of the Bheembur pass. The next day I crossed the 'Kumaon Gosha' mountains, or 'sharp ridged bow,' the range being narrow at the top and bent at each end like a bow. Thence passing through the Serais of Noshehra, Inayutpoora, Chungez, and Muradpoor, I reached Rajaoree on the 8th of September. The Rajah was very attentive and communicative, and I received much interesting information from him. I also procured a history of the country, and some orders by Aurungzebe, and Nadir Shah ; besides a copy of a grant of the Rajaoree territory, by Bahadoor Shah ; since then the territory has been seized bit by bit by the Jummoo family, until only a small circle of 20 miles diameter now remains to the present Rajah.

In the grant given by Bahadoor Shah, the revenue of Rajasore is stated to be 77,77,960 dāma, equivalent to 27,799 Rupees, which with the Customs collected, must have been increased to 50,000 rupees. The territory now is about one fourth of what it was at that time, A. D. 1708, and the Customs have nearly ceased, as the Sikhs give free passes for all their own merchandize ; the present revenue cannot therefore be more than 10,000 rupees, which was the sum stated to me by many respectable natives.

The chief crops in Rajaoree were rice and maize ; the maize invariably occupies the higher grounds, and the rice fields the level alluvial formations along the river ; these were kept constantly flooded by streams conducted along the hill sides from the neighbouring torrents. Height of the city, 2,800 feet.

The hills between Bheembur and Rutun Punjall are all of a coarse greyish sandstone, alternating with loose gravelly conglomerates near Bheembur, and gradually changing into a siliceous state in the Rutun Punjall range,—at the foot of which there are large blocks of conglomerate in compact masses cemented firmly together.

I left Rajaoree on the 10th of September, and after an easy march of eight miles over a stony road, I reached Thunna ;—from whence to the crest of the Rutun Punjall the road was good, but steep. The crest of the pass, I found to be 7,350 feet in height ; from whence there was a noble and extensive view, over the low hills of Rajaoree, of the distant plains of the Punjab. From thence the descent was through a thickly wooded forest of walnut, elm, horse chesnut, and pine trees to the bank of the Bahramgulla river, which I crossed by a bridge, and proceeding up one of its tributaries, I halted at Chundee-murg. Rain had fallen heavily for some days previously, and the small stream had swept away

all its bridges, so that I had some difficulty in making the numerous crossings, which the road took. One of my goats was swept away by the rapidity of the current. The ascent of the Peer Panjall was extremely steep, but the road was good and wide, having been repaired by order of the Sikh Government. My thermometer gave 11,224 feet as the height of the crest of Peer Panjall Pass. From thence the road was a gradual descent for $2\frac{1}{2}$ miles to the Serai Aliabad, built by Ali Murdan Khan; height 9,812 feet. A little below Aliabad the road was narrow, but quite safe, a parapet wall having been built on its outer edge overhanging the torrent below. The place is called Lala Ghulam, after a slave who superintended the work, and whom Ali Murdan is said to have afterwards sacrificed and buried there. Beyond that, the road was good and broad, occasionally ascending and descending to an open piece of ground, called Doojan, below which I crossed the torrent and proceeded along a level pathway to the Serai of Heerpoor. The next day I passed through Shoopyen, and crossed the Shoopyen river, reached Ramoo ke Serai, where I halted; and the next day, 15th of September, I entered Kashmere city, having been three months and two days from Simla.

The city of Kashmere is situated on both sides of the river Behut, at an elevation of 5,046 feet above the sea. I am aware that Baron Hugel made the height 6,300 feet, but Jacquemont calls it 5,246, and Moorcroft says, that the *general* level of the valley is about 5,000 feet. It is of an irregular shape, the greater part being on the right bank of the river; about one fourth of the houses are deserted; but the city must still contain about 80,000 inhabitants.

The information which I have collected regarding Kashmere is not yet completely arranged, so that I cannot give any general results. I may state, however, that I have a list of all the villages in the valley; a minute account of all the passes, including those which are used only for contraband trade; the history of the Shawl Wool from its first starting from Radakh and Khantan (or Changtang) to its arrival in Kashmere, where it is spun into thread, dyed, and woven into Shawls. I have besides ten or twelve specimens of Kashmerian songs translated into English verse; and a very good collection of the coins of the Hindoo Rajahs of Kashmere preceding the Mussulman conquest.

Additions made to the Geography.

I will conclude with stating the additions, which the joint travels of Lieutenant Broome and myself have made to the Geography of the Alpine Punjab.

Of the Sutluj.

1. The whole course of the Spiti river, one of the principal branches of the Sutluj, has been surveyed by Lieut. Broome.

Of the Beas.

2. The whole course of the Teerthun river, one of the principal feeders of the Beas, has been jointly surveyed as well as the Beas river itself, from its source to its junction of the Teerthun river, in addition to which, the mountain course of the Chukkee river has been laid down by Lieut. Cunningham.

Of the Ravee.

3. The whole course of the Nye river, with a portion of the Boodhil river, and also of the upper Ravee, with the further course of the Ravee, after the junction of the Nye and Boodhil rivers as far as Chumba, have been surveyed by Lieutenant Cunningham.

Of the Chenab.

4. The whole course of the Bhaga river, has been surveyed by Lieutenant Broome; the source of the Chundra by the same officer, and the greater part of its course jointly by Lieutenants Broome and Cunningham; and the course of the joint stream of the Chundra Bhaga, as far as Triloknath, by Lieutenant Cunningham. The greater part of the course of the Tohi river, a principal feeder of the Chenab, has likewise been surveyed by the same officer.

Of the Thelum.

The Shoopyen river, which rises in the Peer Punjall, has been surveyed by Lieutenant Cunningham.

Of the Indus.

The source of the Yunam Choo, or Yunam river, a large tributary of the Indus, has been laid down by Lieutenant Broome.

(Signed) ALEXANDER CUNNINGHAM.

1st Lieutenant of Engineers.

Lucknow, 8th February, 1841.

Extracts from Demi-Official Reports.—By Capt. ARTHUR CONOLLY on a Mission into Khorasan, (communicated to the Editor from the Political Secretariat.)

The Huzarah and Eimauk Country which we traversed between Bameean and Meimunna, consists of high unwooded mountains, covered with grass and various shrubs and herbs which serve for spring and summer pasture, and winter fodder, and vallies at different elevations, in the highest of which is grown only the naked Thibetan barley, and in the lowest barley, wheat, and millet.

The Huzarah portion is the coldest and poorest, and the natives with difficulty eke out a living from its natural resources; living in small villages of low huts where they herd during the long winter season under one roof with their cows and sheep, and using as fuel small dry shrubs and the dung of their cattle. An idea of their privations may be formed from the fact that the most of the people do not use salt. There is none in their own country, and as they cannot afford the price which would remunerate importers of this heavy article from Tartary and Afghanistan, they have learned to do without it. Their best bread is consequently very tasteless to a stranger.

But the Huzarahs are not allowed to enjoy even their limited means of existence in peace, for the Oosbega make occasional inroads upon their dwelling places, and sweep away whole villages into slavery, leaving fertile spots desolate. Their neighbours, but religious enemies, the Eimauks, also carry off as many of them as they can, from time to time, conquer or kidnap, and the chiefs of their own race, steal each other's subjects in their petty wars, exporting all they can thus obtain, through Toorkish merchants with whom they have understanding.

We found the Huzarah people unblushing beggars and thieves, but they are mild mannered and industrious, and sigh for the protection of a settled government. Were this given to them, their condition would soon improve in every way. Their chiefs are 'barbarians of the rudest stamp, without any of the barbarous virtues.' They reside in small mud forts, exact as much as they can from all who come within their reach, and form occasional combinations for the defence or attack of each other. The Eimauks differ chiefly from the Huzarahs in being of a more nomade habit, the chiefs consult their dignity and safety, by dwelling in mud forts, but the people reside nearly the whole year in the dry stick and felt tents which are used by the Toorkmans. The chiefs, like

the Huzarah meers, have their feuds, which continually break them up into parties against each other. The people are bolder than the long oppressed Huzarabs, and will get together to attack travellers whom they would rather only attempt to rob privately.

The Soldiers of both tribes are cavalry, mounted chiefly on small active horses of native breed, though some ride horses imported from Toorkistan. Their arms are swords, and matchlocks, the last weapon furnished with a prong for a rest. There are clans of military repute among both people. Their strength lies in the poorness and natural difficulty of their country, but the last defence is I imagine greatly overrated. Parts of the interior are described as much more steep than that which we traversed, but this portion, which is the most important, as being on the high road to Herat, is by no means so inaccessible as it has been represented.

Neither among Huzarabs or Eimauchs is money current, and sheep form the prime standard of barter with the traders who come among them from Afghanistan, and Tartary. These Merchants establish a friendly understanding with chiefs of different districts, to whose forts they repair and open shop, giving their hosts $2\frac{1}{2}$ yards of Kerbus, or coarse narrow cotton cloth, for the value of each sheep received in barter ; and being furnished till their bargains are concluded, with straw for their beasts, and generally bread for themselves and their people. Traders from Herat, Candahar and Cabul bring their checked turbans, coarse cotton cloths and chintzes, tobacco, felt, and carpet dyes, iron spades, and plough ends, molasses and a few raisins. Toorkish Merchants bring similar articles from their own country, with a little rice, cotton, and salt, occasionally horses, which they prefer to exchange for slaves.

The articles which the Huzarabs and Eimauchs bring to market, are men and women, small black oxen, cows, and sheep, clarified butter, some woven wollens for clothing, grain sacks and carpet bags, felts for horse clothing, and patterned carpets, all made from the produce of their flocks, for they export no raw wool. They also furnish lead and sulphur, and the Eimauchs especially speak of copper and silver mines as existing in their mountains, but they do not work them.

Agha Hoossein, a Native of Herat, who had long traded among the the Huzarah, and Eimauch clans, occupying our route between Bamecan and the border of Meimunna, negotiated our passage with a safe guard the whole way for 1,200 Rupees, and we marched with him from Bamecan on the 23rd September 1840, escorted by 80 Huzarabs under a son of Meer Sadik Beg, a leading chief in the district of Deb Nangre. Our road

took us in 3 marches over spurs from the main ridge of Hindoo Koosh (Koh-I-Baba) to the fertile and well inhabited valley of Yaikobung, which has the breadth of from $\frac{1}{4}$ to $\frac{1}{2}$ a mile, in a length of 15 miles, and is well watered by a clear trout stream from the famed 'Bendimir,' which flows on to Bulk. h.

We slept the first night in the cold damp valley of Shebbertoo, which, according to the boiling point of a Thermometer, is about 10,500 feet above the level of the sea. The mercury at sunset stood at 37° ; in the course of the next $\frac{3}{4}$ of an hour it fell to freezing point, in fact before sun rise next morning it was down at 10° . The residents say that they have 5 months winter, which commences late, but is every rigorous, and the deep snow which falls, is not all off the ground two months after the vernal equinox. The rest of the march brought us to the valley of Fuor Behar, about 2,100 feet lower than Shebbertoo, where the barley crop was not all ripe, and the Thermometer showed about 11 degrees difference of temperature. The third took us 8 miles down the valley of Yaikobung, 1,100 feet still lower, where the people had just got in their crops of fine wheat.

The present chief of Yaikobung is Meer Mohib, a vulgar and coarse man. He put Shah Shoojah's letter to his head, and came to pay his respects to us as the bearers of it, when we gave him a suitable present. Having taken leave, he sent to beg for my furred cloak, and on my giving his messenger a note which would procure him one from Bameean, he sent to say that he must have my girdle shawl and 1,000 rupees, and he would permit us to depart. We were too many to be thus bullied here, therefore replying that the Meer seemed to misunderstand our condition, we marched away at once without his daring to interrupt us.

West of Yaikobung, the main ridge of Hindoo Koosh sweeps round to the northward, after which turning westward again, it forms the northern boundary of the hills which slope down to the right side of the Heriroad valley. Our fourth march took us by a very steep defile across this ridge, from the base of which we descended through a deep valley, about 5 miles westward, to the fountain head of the Heriroad a clear pool of gently bubbling springs, where the boiling point shewed an elevation of 9,500 feet, 1,100 higher than the bed of the stream flowing northward from Yaikobung.

We followed the course of the Herat river, in its clear, quick wanderings through different breaks of the limestone valley, which forms its bed, for four marches, the first taking us to the head quarters of Meer Sadik Beg in Dab Yungee. This chief, who is a vulgar but well

disposed man, treated us very hospitably, neither he or his sons read the Shah's letter, but having heard it perused, he stuck it in the top of his turban, and declared that he was His Majesty's servant to do any thing that lay within his limited ability. We remarked that the chief service His Majesty required from the Huzarah Meer was to keep their people loyally quiet, to which Sadik Beg replied, that he should be truly glad to be quiet, both on the king's and his own account, if some of his Huzarah neighbours and Eimauks, would only let him.

We expected to have found awaiting us near this post the Eimauk escort which our guide had engaged from Mahomed Areem Beg, the Atalik of the Feroozkohee clan; but we found that in the interim the Atalik had been persuaded to march with an Eimauk Army against Hussun Sirdar, a powerful chief of the Dah Koondie Huzarahs, and that we must in prudence await instructions from him, or an end of the war. This Sadik Beg said would not last long, as the Eimauks had gone in such numbers, that they would not keep the field for the want of provisions, and the danger he most feared for us, was, our meeting some of these returning troops ere we got the Ataliks safeguard. Our guide therefore went off to the head quarters of the latter chief and finding there one of his sons, persuaded him to come to our camp. The young Eimauk chief arrived at night, and nothing would induce him to go beyond my Meerzas tent.

The Huzarahs, he said, were his sworn enemies, and were capable of any atrocity, why should he put himself within their reach in the dark. Next morning he went up to the fact on Sadik Beg sending him a solemn oath of friendship, and they presently came in a cordial manner together to consult with us about the onward march. The son of the Atalik said that he would give an answer in his father's name to any Eimauks who might come across our road, and as he appeared to be an unvapouring person, he resolved to proceed with him at once. Sadik Beg accompanied us one march with a large body of horse, as he had heard that a party of Huzarahs, from another near Chiefship, had marched to intercept us, turning back at the end of his district, between which and the Eimauk border a few miles of the valley are left waste. Our reported enemy, the Chief of Sal, met us here with 100 horse, and said that he had ridden to our assistance, on the intelligence that Hussan Khan of the Tymunnee Eimauks had occupied the road ahead, with the intention of plundering us. We understood this to be a demand for a present, so adding to our thanks a Cashmere

shawl, we marched on, receiving from our way side acquaintance a parting caution to put no trust in any Eimauk.

We safely concluded this day's march of 12 miles, which brought us among a quite different people. In point of personal appearance the advantage was certainly on the side of the Eimaux, who though living closely after the nomade fashion of Toorkmans and Oosbega, have the features rather of Darrians than Tartars. The Feroorcokehs indeed claim descent from a Colony, which was exported from Feroorkoh, in the Persian province of Mazenderan. We encamped upon the right bank of the Henrood, among people of this clan, half a mile off on the other side of the river was the fort of Dowlut Yar, surrounded by villages of Tymunnee tents, to which we learned that Hussan Khan had returned the day before, apparently without having entertained any idea of barring our road.

The war, we learned, was ended. It had its origin in an act of violence committed 9 years before upon the very Agha Hossein attending us as guide, then travelling with a stock of goods from Herat to Cabool, who was plundered by the former chief of Dowlut Yar, for preferring the quarters of our host the Ferozkohee Atalik. The latter Chief not being able with his domestic means to force a restitution of the goods taken from his protégé, allowed Agha Hossein to call upon his Huzarah friends for succour, and the leading chief of Deh Koondée, Hussan Sirdar, glad to indulge a national dislike while defending a commercial privilege which it concerned every Chief, whether Eimauk or Huzarah, to uphold, came with such a large force that he took the lead in the operations against Dowlut Yar, having captured and utterly rased the fort; after killing its Chief and his eldest son, he gave the old man's wife to his own brother, and took his daughter to himself, returning home only, when he had captured another fort nearer the border, and placed a party of his own men therein. Agha Hossein got all his goods that could be recovered, and so retired. But now the Atulik regretted the loss of Eimauk reputation to which he had been accessory, so he countenanced a stratagem by which the border fort was recaptured, and having helped to rebuild that of Dowlut Yar, brought back the old chief's second son, the present Hussan Khan, to inherit it. The latter had just before our coming persuaded most of the Eimauk Chiefs, including his father's first adversary the Atalik, to make an attack upon Hussan Sirdar of Deh Koondée, for the cleansing of their national reputation. The quarrel was accommodated in a way to make the Eimaux appear superior, by the

Deh Koondée Sirdar's restoring the arms which he had taken from Hussan Khan's father and engaging to give 2 or 3 daughters to the heir and his relatives, to close the blood account.

Agha Hossein our guide, who thought it well to remove all ill blood from Hussan Khan's heart for the excusable share that he had in the past disasters, went to Dowlut Yar, with a koran, on which he declared before witnesses that he absolved the chief from all obligations to repair his former losses, and called upon him to say in the same solemn way that by-gones should be by-gones. The Chief consented, and accepted a present which we sent with a letter to his address from Shah Shoojah, but his manner on both occasions was so sullen that our guide resolved to give him the least possible opportunity of doing us an injury.

The Atalik arrived in our camp next morning, and speaking with confidence about our road forward, sent us on with a small escort under his brother and son, while he went to get back from Hussan Khan a horse stolen from our pickets which had been traced to Dowlut Yar. When we had got 2 miles down the valley we were met by 60 horsemen, who called out to us to stop and pay zucat. The Atalik's brother riding a head, and explaining that we were envoys on the King's affairs, and not traders, our waylayer replied that we had paid our way to others, and why not to him. 'They are guests of the Atalik' exclaimed his brother, 'and by God and the Prophet they shall not give a needle or a Chillum of tobacco.' 'Then by God and the Prophet we will take it', rejoined the robber; whereupon he ranged some of his men in line to face us and caused others to dismount upon a rock behind and to set their guns in rest. We lost no time in getting ready for defence, but the Atalik's brother riding out between our fronts, called a parley, and drew a line which neither party was to pass till peace or war had been decided on. Three quarters of an hour was consumed in debate, which was thrice broken by demonstration of attack and by the end of this time 30 or 40 men of the same tribe had collected on foot from a rear encampment, with the evident intention of making a rush at our baggage in the event of our becoming engaged in front. We had despatched several messengers to bring up our host, and just at the affair had assumed its worst look, a cry was raised that he was coming. Looking back, we could see horsemen pouring out like bees, from the tents surrounding Dowlut Yar, and all hastening in our direction, but while our Eimauk escort exclaimed that the Atalik was coming in force to the rescue, our opponents cried out in scorn that Hussan Khan was coming to help them to plunder us, and each party,

raised a shout for the supposed reinforcement. After about 10 minutes of the most intense anxiety during which we and our opponents, as if by mutual agreement, waited to see whose conjecture was right, we were relieved by the arrival of the Atalik, who galloping up ahead to us at the utmost speed, exclaimed that he had brought Hussan Khan to our defence. The announced ally was not long in following with 300 men, and our enemies were made to understand that they must abandon all idea of attacking us. Hussan Khan declaring that we were envoy's recommended to him by the Shah whose slave he was, and that he would allow no one to molest us. It seemed pretty clear that the Atalik had wrought this loyal zeal in Hussan Khan's mind, and probably, from the delay which had occurred, that he had not found the task easy; but 'twas not a time to scrutinize very particularly the motives which had brought us a defender, so we gave Hussan Khan the politest credit for his professions, and at evening sent him a handsome shawl from the Atalik's fort, with a promise that we would not fail to represent his conduct to the Shah.

We arrived that evening without further adventure, at Badgah in Cheghehezan, a fort in the Herirood valley which is the family seat of the Feroozkohee Atalik, and we shewed our appreciation of the service which this chief had rendered us by giving a very handsome present to him, besides gifts according to their degrees to his brother and other relations.

We were detained 4 days at Badgah, first in consequence of the Atalik's indisposition, and then in order to get rid of a neighbouring chief connected with him, Kurar Beg of Surusghar, who threatened to attack us in our very camp near the Atalik's fort unless we paid him black mail, his right to demand this, he said, lying simply in his power to enforce its payment. After causing us several alarms, Kurar Beg listened to the remonstrances of the Atalik, the aid of our host being necessary to protect him from another more powerful chief whose son he had murdered in his own house, and he came to pay us a visit, attended by 200 followers.

We now left the Herirood valley, ascending 3 miles through the hills on its northern side to a ridge running parallel with it, and proceeding 8 miles further to the northward over an undulating down to the summit of the main ridge of Hindoo Koosh, which we crossed by the easy pass of Shategh i Ghilmee. It is not higher to the eye than the ridge first noted, and there are higher looking masses to the northward, but our guides said that it rose again both east and westward, and their defini-

tion need not be disputed, for the springs on one side of this trunk flow to the Herirood, and on the other towards Tartary. We descended from it to a deep and rapid brook called the Tungan; which led us 4 miles down with the cultivated valley of Ghilmee to the mouth of a deep and close pass called the Derah i Khurgoosh, or the Hare's defile, where the boiling point shewed an elevation of 5,200 feet, about 400 feet lower than our last station in the valley of the Herirood.

Friday 9th October. Quitting camp at 9, 15, we followed the brook Tungan into the Hare's defile, commanding the road at the second of 3 angles. In the first 500 yards, was a brick wall with holes built up like a screen upon a not easily attainable portion of the rock, which we were told was anciently erected to help the collection of transit duty. We next went $13\frac{1}{2}$ miles between bare perpendicular mountains of limestone, the defile running in acute zigzags which for the most part were not more than 50 or 60 yards long, and having but breadth enough for a path, and for the brook which we were continually obliged to cross. Burnes, I see, states that after crossing the Dundan Shikan, he travelled on northward to Khoollum between frequently precipitous rocks which rose on either side to the height of 300 feet and obscured all stars at night, except those of the zenith. I am afraid of exaggerating the height of the cliffs between which our road here lay by guessing at their height in feet, so will only say that their precipitous elevation made our horsemen look like pigmies as they filed along their bases in the bed. After this very narrow portion, the defile widened to the breadth of 50 yards, but it presently contracted again to that of thirty, which may be stated as the average width of its onward windings for nearly 5 miles, where the Tungan discharged itself into the river Moorghaub, which came from the east, in a bed of good width, through a similar deep pass. After creeping along the bottom of the defile for the first $2\frac{1}{2}$ hours of our march, we ascended some way up the side of the left mountain, and followed the bends for the next hour and a quarter by a narrow path worn upon its slightly sloping edge, a tangled thicket now occupying all the spare bed of the stream, to which we descended again $\frac{1}{2}$ mile before its junction with the Moorghaub. The Tungan is a deep brook before its entrance into the Hare's defile. In spring, what with the increase of its waters from melted snow, and and their compression between the sharp turnings of the narrow defile, there is no passage from side to side, except such as is afforded for a footman by means of a spear laid across its rocky banks. The distances noted afford a very imperfect description of the quantity of ground that must

be traversed by a traveller through this defile. An idea of its windings may be formed from the facts, that our baggage ponies were nearly 4 hours creeping along a distance for which my observations afford a direct line of $6\frac{1}{2}$ miles, and that the portion of our road which lay in the bed, crossed the stream 34 times.

What is called the Derah i Khurgoosh ends at the junction of the Tungan with the Moorghaub, but the narrowness and difficulty of the pass continues for a mile further down the left bank of the latter stream, which we forded where the water was up to our ponies' shoulders, running at the rate of, I should imagine, $3\frac{1}{2}$ miles per hour. A steep road, which laden ponies take, ascended a little above the entrance of Derah i Khurgoosh, which comes down again just below the junction of the two streams.

Afterward the pass opens out into a warm little valley of 250 yards width, called Taitak, or under the mountain, at the end of which we halted near some Eimauk tents. Hence we turned off northerly from the Moorghaub, and ascending by a moderate steep pass to the top of the hills enclosing its right side, proceeded on a gentle rise over an undulating surface that gained to a small grassy vale lying at the foot of a higher pass. Here we had an unpleasant scene with the greedy relatives of the Atalik accompanying us, who announcing their intention to take leave, demanded presents extravagantly above any claims that they could prefer for reward, and by their united clamour hindered all endeavours to moderate their claims made by our host, to whom alone were we strictly bound to give any thing. After I had gone out of the way to satisfy these beggars, they went off as if they were the party robbed, and I have no doubt that they incited the attack which was made upon us the next day.

October 11th. Quitting camp at 10, we ascended $\frac{1}{2}$ mile up a rocky pass to the spring head of Misree, which waters a small grassy level in the enclosure of the pass where we found an Eimauk encampment. The pass upward from this little platform was steepish, though on an equal ascent, and the path was tiring, lying over small loose fragments of slaty limestone which had fallen from the shelving bases of the decomposed cliffs on each side. The defile above the spring gradually narrowed in an ascent of about $13\frac{1}{4}$ miles, which our laden ponies were 40 minutes accomplishing, to a point at which the steep rocks, enclosing it almost met, leaving a short passage through which 3 horsemen could ride abreast. Our foremost riders had nearly reached this point when a number of armed men rising with shouts from their ambuscade above it and on either side

of us, began with one accord to pelt stones at us and to fire their guns, those who were on our flanks also loosennig pieces of rock which came bounding down the shingle bank with force enough to bear away any thing occupying the path. Fortunately the cafila was far enough behind to avoid the first of the attack, and we retreated to an open part of the pass, where, making ourselves masters of the shelving bank on each side, we entered into negotiation with our assailants ahead. After much time had been lost in parley, our aggressors agreed to take a few pieces of chintz and 40 rupees (as we had no more goods) and invited us to advance, but we had scarcely reached the old point, when our envoy sent with the cloths and cash agreed to, came running down to us stripped and beaten; and the attack upon us was renewed. Our skirmishers having kept the shelving flanks, we had not to retreat far, and having briefly consulted on turning again, we decided that there was nothing for it but to force our way, so advancing with our best musquet men on foot, while those left with the cafila followed in close order, firing over our heads at the cliffs above, we in less than 10 minutes made ourselves masters of the narrow passage, from which our enemies retreated over the hills. Some of our men and horses were severely bruised by the stones which were raised upon us during this push, but 20 boxes were broken, and the only gun shot wound that could be found was in the cloak of one of my Hindoostanee servants. I am happy to believe that none of our cowardly enemies were killed or seriously wounded, for we found no dead men on the rocks taken, and they retreated too fast to carry off any who were much disabled.

We were 40 minutes more ascending to the summit of the pass, but the defile was comparatively open above the narrow passage, the rocks on each side being low and rounded. We here took leave of the Atalik who had come after us on hearing that we were attacked. I believe him to be about the best man in his country.

We rested at evening in the small valley of Hushtumee, where we found officers collecting the tax of one sheep in forty for the Walee of Meimunna. Our next two marches were over the mountains of the Hindoo Koosh, from which we made a steep descent, leaving the mouth of the defile by which they are entered nearly 6 miles S. E. of Meimunna, to which we proceeded through a fertile valley bounded by low and round earthy hills, the stream which we had followed from the foot of the mountains irrigating countless vineyards and gardens, the walls and trees of which concealed the town till we were inside it.

Somes miles before reaching Meimunna we observed a sign that we were approaching a slave mart, for an old man who rode out from a small encampment to offer his horse to us for sale, said that he would take a young male slave and a pony for it. We told him that we were not men sellers, and asked him if he was not ashamed to deal in the Khulk'Oollah. (God's Creatures.) He replied that he could only do as every body round him did, but that he did not require the actual slave, only the value of one, shewing that men are here a standard of barter as sheep are among the Huzarahs. Herattees, this old broker said, were comparatively speaking a drug in the market, owing to the quantity that the vuzeer of that city had exported. Huzarahs were so so, and the only captives that would now fetch a good price, were the young men and girls of Roum and (*illeg. in MS.*) or other real Kuzzilbashees.

Mirrab Khan was out upon his annual battu when we arrived, but his brother gave us excellent lodging, where our people and horses were daily provided with every thing that could be desired. The Walee returned on the 4th day of our detention, and courteously visited us the next morning, when after presenting to him Shah Shoojah's letter and a dress of honor, I quite won his heart by giving him a double barrelled percussion gun, he being passionately addicted to field sports. We went the next day to return his visit, and the following is my note of the interview.

Mirrab Khan bade us frankly welcome, and ordered in breakfast of bread, fruit and salted cream tea, of which we partook together, our servants carrying off parcels of fine green tea imported from Yarkund, and large loaves of Russian refined sugar, which were set before us upon large platters of dried fruits, as the host's offering.

I could not obtain certain accounts of Mirrab Khan's revenue, for he keeps no regular dufter. My Meerza witnessed this irregularity for years, and used to remonstrate with Mirrab Khan about it, when the chief would reply that it was not the Oosbeg way to take particular account of what came and went, a saying confirmed by report of the laxity, which prevails in the financial department of Khiva, and even in that of the more formally organized government of Bokhara. Mirrab Khan expected to be furnished with means for all his expenses by his Dewan Beggee, who was able to do this without murmuring, after getting in half of the Walee's due from the inferior officers, through whose hands it came. I have roughly calculated the Walee's annual expenses at 10,000 tillas, or 80,000 Caubul rupees, which supposing my preceding conjecture right, would give him a fair revenue of a lakh, and a half of

rupees, but this might be increased very greatly, if any thing like system were introduced into his government. It is said at Meimunna that Ahmud Shah imposed a tax of one toman upon each of 360 ploughs, belonging to as many villages in this district, then registered under Aumilders, for the support of Hajee Khan's Mehman Khanah. Those ploughs were understood to be used for the cultivation of lands watered by natural streams, (there are no kuhreezes in this country), and something more than 3 times their produce was said to be raised from Daimee land or soil watered by the heavens. If we allow 15 khurwars for the crop of one plough, we have 5,400 khurwars for the stream lands; 3 times this for the rain crops would be 17,200 khurwars and the total 23,600 Ditto. The country is certainly now better populated and cultivated than it was at the beginning of the Dooranee monarchy, so a guess may be made at the least amount of its agricultural produce, but I cannot pretend to determine this. Much again is exported from this province to the Eimauks and Huzarabs, and, latterly, to Herat. In cheap times a khurwar, or 100 muns, of wheat is sold for a ducat; we only get a third of this quantity for the same money.

We made 5 marches to the southward of west, viâ Alma, Keisu and Charshumbel from Meimunna to the rise of the Moorghaub encamping on its bank at the fort of Karoul Khaneh's a few miles below the fort of Bala Moorghaub which we did not see. In view upon our left during these 5 marches was the northermost ridge of the Hindoo Koosh mountains from which we descended behind Meimunna. Our road lay upon easy rises and falls through hills of a light clayey soil, enclosing many well watered vallies and glens, in which is cultivated wheat, barley, millet, sesame, flax and cotton; vineyards and gardens flourish about the villages at the chief of which brisk little fairs are held twice a week for the convenience of the country round. It is a fruitful country which only requires more inhabitants, and I learn that the districts on towards Herat, as well as those under the mountains eastward of Meimunna, are of similar character.

We found our road to Karoul Khazeh safe, but vigilantly watched by patrolling parties detached by the Walee of Meimunna, the Jemsheiddee tribe, and the Soonnee Huzarabs of Killah. Several cofilas passed us, going to Bokhara with merchandize, or to Meimunna for grain, and we met single Toorkmauns riding horses to Meimunna which they designed to exchange there for slaves. On the 4th March, when we had passed the ruined fort of Kaornach, anciently the Jemsheeddee border mark, we were met by a young chief of the latter tribe, who thinking that our influence might avail him at Herat, complained that he had been driven

from his home by Mahommud Zeman Khan, his more powerful rival of the same clan, who on sending a party of those who had followed him, to cultivate land near Nerochok had fairly seized their crops, driven off their cattle and sold 25 persons to the Toorkmauns. This confirmed the statement which we had heard at Meimunna, and which we soon ceased to doubt that the Soonnee religion is no longer a safeguard against captivity. Every defenceless person who can be used for labor is carried off to the insatiable markets of Tartary. We were followed by a small cafile of slaves from Meimunna consisting of Sheah Huzarabs and Soonnee Eimauks, of all ages from 5 to 30.

We forded the Moorghaub at Karoul Khaneh, and our onward march lay along or near its left bank for 8 marches to Merve. The first took us past the rather imposing, but desolate mud fort and citadel of Merochak. Many mud pillars, which were formerly used by watchers of crops, yet stand among the weedy bushes that have overrun the chief portion of this now deserted valley, and the land retains many traces of the industry with which it used to be irrigated. In parts high weeds have sprung up thickly where flood water from the Moorghaub has been allowed to settle, and its stagnation in those marshes is doubtless the chief cause of the malaria which makes this district uninhabitable during the heat of summer. The next wide break of the Moorghaub valley below a broad belt of low dry hills which bound Merochak, forms the head of the division called Punjdeb extending 20 miles down to a point where the stream of Kooshk joins the Moorghaub, which although it contains weedy vegetation in standing water on one side, is well inhabited by Tookmauns, who are evidently in a flourishing condition. They breed many horses which they profitably export; and they find pasture for large flocks of sheep, and herds of camels in their range of the valley parts of which they cultivate with jewaree wheat and barley.

These Toorkmauns are a colony of the Ersaurree tribe from the banks of the Oxus, divided into 4 clans, called Oolle Zuppeh, Kureh Shughsee, and Chunghee which they estimate in round numbers at 500 tents each.

At Punjdeb we laid in 5 days' dry provisions for ourselves and horses, there being no encampments upon our road or along the Moorghaub to Yellatoon. The right of the valley, which the river favors, is for nearly all through bounded by a well defined line of low hills. The left, near which our road lay, was sided by hillocks and undulations than positive hills. On the 2d March we first observed sand lying upon the hill as if drifted by northerly winds from the desert, and a third of our onward way lay, over loose beds of sand that covered portions of the hard white clay soil,

which forms the proper surface of the country as far as Merve. The bank of the Moorghaub upon which we halted each night, was thickly fringed with Tamarisk bushes. The water of the river was very muddy, flowing ly with eddies at the rate of one and a quarter mile per hour, and having many dangerous quicksands. We very nearly lost a man who rode his horses a little way in to drink. Though we met no tents we saw vast flocks of sheep which are sent thus far from Merve to pasture with a few shepherds and dogs. We carried chopped straw upon our horses, being accustomed to it, but there was no want of grass on the way for the native horses of our fellow travellers who had not gone to this expense. The road is by no means difficult abounding as it does in grass, wood and water, and it was evidently well travelled formerly.

Our third march brought us to a very fine caravansary of burned bricks, containing accommodation for many men and beasts, which is attributed to Abdoolah Khan of Bokhara a philanthropist who has the credit of all good works in these countries, as Alle Merdun Khan does in Afghanistan. Close to it is a mausoleum sacred to the memory of some Imaum forgotten.

Despatch from Lieut. H. Bigge, Assistant Agent, detached to the Naga Hills, to Capt. Jenkins, Agent Governor General, N.E. Frontier, communicated from the Political Secretariat of India to the Secretary to the Asiatic Society.

I have the honor to report my arrival at this Post, (Demalpore) where I am happy to state large supplies of grain, &c. &c., are now daily arriving for the use of the troops about to accompany me to the Naga hills.

Having been prevented, from the total want of population on the road between Rangalao Ghur and Kasirangah, of Mehal Morung, from passing up that line of country, I crossed to the north bank of the Burram-pooter at Bishnath, and passing through the villages of Baghmaree, Rangalli, Goopore, and Kolah Barri in the Luckimpore district, crossed the Maguli Island to Dehingeahgong, and so through Deergong to Cacharri Hath, where I fell in with the detachment of the Assam Lt. Inf. which Captain Hannay had sent off, to await my orders at Nogorah.

From Cacharri Hath I passed to the Dhunseri river at Golah ghaunt, where I was glad to find that the greatest portion of the supplies of rice, &c. dispatched by me from Nogong, had all arrived safely, and

that a large portion had been sent forward; the remainder was speedily transferred to smaller boats, and is now close at hand, having been brought by water to a small river called Daopani, one march on this side Hir Pathor, (Bor Phalong of Captain Pemberton's maps) and from whence a path through the forests had been previously cleared to the nearest point to this.

From a demi-official letter, received at Golah ghaut from Captain Hannay, I was led to believe that large supplies had been collected for the use of his detachment at Nagorah, but in this there must have been some mistake, as the Jemadar in command informs me, that, but very little rice has been collected, and not much more may be expected at present.

Never having previously relied on any other arrangements than those I made when at Nogong, but little, if any delay will result from this circumstance; and the detachment was ordered to leave Nagorah on the 1st instant at latest, and will, probably, should the heavy rains we have had not detain them, arrive here on the 5th or 6th instant.

I remained 3 or 4 days at Golah ghaut, superintending my arrangements, and was present at a sort of fair, held there, on the arrival of a fleet of boats, laden with cotton from the Lotah Nagah Hills on the Dogong river, which falls into the Dhunsini a short way above; about 70 of the Nagas came down, with two of their sykeats, many of them understanding the Assamese language, and were engaged the whole day in bartering their cotton, for salt, dried fish, dogs, fowls, and ducks, with a few brass rings, of which they seem very fond, suspending them one below the other from holes bored in the ear.

The general average of prices was about

1 Seer of Salt	4 to 5 of Cotton.
1 Dog	3 (they eat this animal.)
1 Fowl or Duck.....	1½ to 2.

On visiting their camp a little above the ghaut, I found several of them lying on the ground, intoxicated from the effects of a most disgusting sort of spirituous liquor they make from rice, and which they drink hot; they are a very sullen race, and it was with some difficulty I could get any replies to the few questions I asked them.

Regarding the madder, with which the hair on their spears was dyed, I tried a long time to gain some correct information, but in vain, the Sykeah told me, they had none in their own hills, but what they used was brought to them by the *Abor Nagas*, a tribe I have not yet heard of, but believe it will be found to mean the Amgamees, of whom they seemed to stand much in dread, and from whom they said they received

a large portion of the cotton, they brought down for sale, acting, it would appear from this, more as merchants than the actual growers.

The country of these Abors, they described as being due south from their hills, but they said distant 2 months' journey, an obvious error, as such a distance would take them far to the south of Munnipore. As the name of this tribe was also made use of by the Rengmah Nagas (inhabiting the hill between those of the makers of Nagong and the Dhunsiri) I may hereafter be able perhaps to make myself better acquainted with their position, though this tribe also seem to fear them fully as much as the Lotahs.

In appearance, the Lotah Nagas are of a short, though stout build, and some of them by no means ill-looking; they wear no more clothing than their brethren of other parts, and are alike filthy in their persons and habits, and have a pompous mode of addressing one, which might in some cases be interpreted as insolent. I shewed them some clasp knives, I took down with me for the purpose, at which they laughed, and sneeringly remarked, 'of what use were they? Naga requires only a *dhan*, and his spears; such things are of no use or value to us:' before quitting this race, I may as well observe that they carry away about 12 or 1,300 maunds of salt annually, in exchange for cotton, so that their trade may be deemed equal to near 10,000 mds. of cotton in all.

There are several merchants, chiefly Kyahs, from Marwar, established at Golah ghaut, besides Musselmans from Goalpara, but so little trade is there for any thing besides cotton, that I was unable to procure a brass pot of any sort; woollens and every other descriptions of cloth are alike unsought for, their stock in trade being composed entirely of salt.

A large quantity of iron being found and manufactured in the neighbourhood of Golah ghaut, the Nagas obtain their *dhans* chiefly from hence, the price of which appeared to me very high, being 4 as. each, and the iron fetching as much as 8 Rs. per maund, unwrought; the quantity annually manufactured, I was unable to ascertain.

Leaving Golah ghaut in company with Mr. Herring who had joined me from Bishnath, by appointment, we passed through a long belt of dense forest to the Nambur Nuddie, about 10 miles, for the purpose of visiting together the salt springs, and lime stone rocks, which are found on its banks. The camp was formed for the night on a small sand bank, round which the river ran, and in the centre of which was the salt spring, or, called by the natives, on account of the heat, the *Jucung poong* or hot springs.

The water from this spring is beautifully clear, and of a temperature of $110\frac{1}{2}^{\circ}$ in the well, to $11\frac{1}{2}^{\circ}$ in the sand, as determined by most accurate observation, from a first rate thermometer obtained from London, for such purposes :—this was at 3h. 33m. P. M., the temperature of the air being $59\frac{1}{2}^{\circ}$ at the time, repeating the observations the next morning at 7. A. M. when the atmosphere was at 43° . I found no difference in the temperature of the water.

The water when drank appeared to me to contain but very little salt, and flavored rather of sulphur than any thing else ; the spring is a very abundant one, and would nearly suffice to turn a water wheel, but is so little elevated above the level rain, that a rise of only two feet would be sufficient to swamp it, while from the water marks on the trees, it was obvious that the whole was submerged in the rains from 7 to 8 feet.

The neighbourhood of the spring was every where trodden down by elephants, buffaloes, deer, &c. which animals resort there in great numbers to drink the waters, through my own elephant, ponies, &c. refused to taste it ; in the centre of the spring there is a depth of about 1 foot of water, below which the feet or hand might easily be passed through a thin bed of sand, composed entirely of quartz to a bed of large pebbles of a similar nature, and it was resting the thermometer on the latter bed that the greatest heat $113\frac{1}{2}^{\circ}$ was obtained.

This spring is situated about $1\frac{1}{2}$ or $3\frac{1}{2}$ of a mile from the Dhunsiri, but in spite of this, I fear the returns would not be worth any persons while establishing a manufactory of salt, as he must leave the place in May, and could not expect to return till November, which would be the earliest date at which these forests could become habitable after the rains.

I boiled a large quantity of water, about 2 gallons, till it was reduced to $\frac{2}{3}$ of a quart, which was afterwards evaporated at Bor Pathor, but not more than a tea-spoon full of salt was obtained, a very poor return, I should suppose, though the salt was to the taste extremely good.

The morning after I reached this spring, as the distance to Bor Pathor, was but short, Mr. Herring and myself proceeded through the forest, along the banks of the Nambur Nuddie, to visit the other springs, and also the limestone beds, distant by the watch $1\frac{1}{2}$ hours, in a S. W. direction. A short way below the springs, in a small stream, running from them, on which the water was pleasantly warm. Mr. Herring's discovered some trees, which struck us both as being tea, though I am uncertain as to the fact, but have sent specimens of the leaves, flowers, and fruits, through Capt. Vetch, to be examined by Dr. Arnott and Mr.

Watkins, as in the event of their proving genuine, would greatly enhance the value of the springs and quarries.

The salt springs which are 3 in number are situated 250 yards to the north of the Nambur Nuddie, in a small circular space, surrounded by forest, but are neither so hot or apparently so strong of brine as that we first saw. The temperature being as follows.

In the shade,	64° air.
Large spring,	95° water.
Smaller one,	98°

The difference between the larger and smaller springs being doubtless caused by a small stream of water flowing into it.

In the time of the Assam Rajahs, it appears, these salt springs were regularly worked, and the water dammed up for the purpose, as the remains of the parts which formed the dams are visible in the stream, which falls into the well, as also in that which carries off the water.

The limestone, of which I send specimens, is found in the bed of the Nambur Nuddie, close to the salt spring, where it appears at the clay; as also in the small stream above mentioned, which runs through the larger spring about 200 yards further up, and beyond which, about $1\frac{1}{2}$ a mile, is found pipe-clay, some detached pieces of which I saw, but had not time, on a second visit to these wells, to reach the beds.

It is a curious fact perhaps, that a large quantity of small fish, inhabit the larger of these wells, and it was a subject of much regret, that I was unable to procure any, as specimens, as it could not but have been satisfactory to ascertain, what description of fish these were, which delighted in such a temperature and in such water.

The only drawback to the effectually working these spring, and lime-beds, for a certain number of months during the year, appears to be the want of conveyance to the Dhunsiri river, and I think it might be worth the experiment of making an outlay, on the part of Government, of 2 or 300 rupees to effect the same, either by cutting a road through the forest, or by erecting *Batahs* (or dams) in the river, so as to allow of its becoming navigable for small boats, which might easily be dragged over the slight falls when empty, and as easily taken down when laden, a practice much in use on the Dying river of Cachar, as you have had opportunity of observing.

Should such a proposition meet with the approbation of Government, I believe Mr. Herring would be happy to devote a considerable degree of attention and minor expense, so as to render these wells far more valuable than they otherwise can become, by sinking shafts at a little

distance from the present springs, with a view of procuring a purer supply of salt water, for the purposes of manufacture, and would also work the lime stone in conjunction with the salt, but without this aid, situated as these productions are, in the midst of an uninhabited forest, and not within 8 miles of any population, I fear there is not inducement, sufficient to render it worth his while attempting it, or incurring the expense which must necessarily attend such an undertaking.

I may here observe that these forests abound with the finest *Nahor Trees* I have ever seen, a wood, which, though from its weight and extreme hardness, is perhaps not adapted for all purposes, is most admirably so for beams, posts, &c. where great strength and durability is required, and might be very advantageously used in all Government buildings where obtainable.

I left Bar Pathor after seeing all my supplies well off in boats on the 28th ultimo, reaching the mouth of the Duopani Nuddi on that day, the Hurrioghan Mookh on the 29th, the Debopani Mookh on the 30th, and arriving here on the afternoon of the 31st, the road running along the line of the Dhunsiri, though straightened in many of the turnings for 38 miles through the densest forests, the last 10 miles being up the bed of the Dhunsiri itself.

Through all the desolate jungles that I have hitherto travelled, and they are not a few, I never met with one so completely abandoned by life as this; no animal of any kind was seen, nor was a bird heard from morning till night, the death-like silence being only broken by the heavy fall of the *Otengah* fruit, these trees composing the entire forest or nearly so. The marks of the river left on the trees was every where visible from 1 to 9 feet in height, forbidding all idea of making this line, that of communication with this post, save during the cold season, and that too at a late period from the number of impassable swamps, which everywhere intervene, and render all attempts at rendering the present path any shorter, or much more practicable than it is, alike unavailing.

Fodder for cattle, especially elephants, is remarkably scarce, my men finding the greatest difficulty in obtaining the smallest supply, and that too of a very poor description.

The vast number of trees, which are sunk in the river and on the sands, render the navigation for boats almost impossible, beyond the Daopani, unless perhaps during the rains, and even then, it is not without the greatest care, that boats can proceed, either up, or still more so, down the river; a very large one last year was swamped close to Bor Pathor, while passing down empty, being entangled in a large tree, one of

the men being drowned, and the rest with difficulty saved, the boat being lost.

Such being the state of the country on the North side, it will be necessary to open a better communication, than at present exists towards Mohong Dezoah, and for that purpose, I intend engaging a large number of coolies, if possible, from Tuli Ram Senaputti's country, to construct a regular road from Mohong Dezoah to this part, unless a better site can be shortly discovered, clearing away the jungle, and if he will agree to it, locating 10 or 15 families of Meekirs, at this place who shall be kept up for the purpose of clearing the roads, &c. for the future.

Should he agree, I shall further propose, that the revenue of these persons shall be for the present defrayed by government, either by a direct payment to the ryots themselves, of the amount demandable from them by the Senaputti, or in case of their objecting, a trifle more, or by crediting him that amount from the annual tribute paid by him to government in ivory.

Should I be able during my present expedition to reduce the Nagah chiefs to any state of order, it would be desirable further, to try and settle a few of these men in the neighbourhood, on the East bank of the Dhunşiri, allowing them to occupy any lands they choose, exempt entirely from all rent or taxation, until such time as matters shall be so changed, as to seem to call for fresh arrangements; as however this is mere speculation, I shall pursue it no further at present.

While at Bar Pathor I was visited, on invitation, by the Phokun or chief of the Rengmah tribe of Nagas before mentioned, who complained of the loss he had sustained, together with his tribe, by the abolition of the former establishment of *Kulkees*, or, I might call them, supercargoes, who were formerly the medium of communication between this race and the merchants, in all their dealings, through whom all orders, and communications to the Nagas passed, begging their restoration, together with the small quantity of lands, &c. which these persons enjoyed as a remuneration for their services.

From the short conversation I had with the Phokun, he was anxious not to stay, on account of some religious festival which commenced 2 days afterwards; he stated that the lands and pykes were bestowed on his grandfather and father, for services done in the time of the insurrection of the Muttacks or Moamarriah tribe, in preserving the property, &c. of the then Bor Gohain of Assam; that he had applied to Mr. Scott, on the subject, at Gowhattee in person, and had received assurance that his claims should be considered as good, but that now the whole lands have been

taxed, the *kutkees* abolished, and that his authority and rank have fallen so low, that scarcely his own tribe acknowledge him.

I regret that I am not acquainted with the reasons, on which the arrangements now in force were adopted, sufficiently, to enable me to enter into a full detail of the case, but you may be able from what I have stated, to refer to the documents, I have now with me, and form an opinion, whether on payment of a small tribute in ivory, which they are, I was informed ready, and willing to pay, the remission to the extent required might not safely be effected.

The Phokun further expressed a desire to be taken under protection from the attacks of the Lotah tribe of Nagas, with whom there has been an enmity existing for a long time, and he asserts, though I fear without any direct proof (he promised to produce witnesses before me at this place to depose to the fact), of the village called Beloo, not far from Mohong Dezo-oah, having been attacked by a party of Lotahs from the village of Tagdie, last year, and one man and a child murdered. On this subject I shall again address you when the evidence shall have been adduced, but may observe that the trade of the Lotah Nagas being completely in the power of the Principal Assistant Commissioner of Seelpore, some injunctions might be conveyed to the Naga Hazarri of that tribe holding him responsible for any repetition of such acts.

Looking at the map of this country, you may observe that the inclination of the lime formation of the Nambur Nuddie will exactly, or within a trifle, correct the points at which it has also been found at the Falls of the Jumoonah, near Mohong Dezo-oah at Langolar, spelt 'Lowrung' in Captain Pemberton's Map on the Kopili, and so on towards Sylhet, not improbably forming one long line of similar formation throughout.

Note on the Brahooees.—By CAPT. HART, Bombay Army.

These tribes are the descendants of 'Braho,' a Bulooche, who emigrated, about the second century of the Hejira from Aleppo to Mukran : some years after his countrymen had settled there, he fixed his abode at Koliva, a few days journey to the westward of Kelot which city was then inhabited by the Tajuks, over whom ruled a Hakim from Herat, the seat of sovereignty. These Tajuks were a turbulent and overbearing race, noted for their hatred to the yoke of Herat. Several of their Hakims had been slain in popular commotions, and at length the part was considered of such danger, that a newly appointed governor

exacted an oath from the heads of the tribe, that they would not destroy him by the sword or poison, before he ventured to enter the city. On the strength of his fancied security, he harassed the people by his exactions, and his death was in consequence decided on. To adhere to the letter of their bond while the spirit was evaded, five hundred of the Tajuks baked cakes of bread, in which they mixed up stones and cotton with the dough. These they concealed under their garments, and attended the Hakim's Durbar. A dispute soon arose between him and one of the landholders, and the passions of the assembly being excited, they stood up of one accord, and slew him by blows with the cakes. They then determined on choosing a Governor for themselves, and 'Braho,' whose countless flocks and herds entitled him to consideration in the country, was solicited to take up his residence in Kelat as their Lord and Master, he declined complying with their request, on the plea of preferring a life in the wilds to the confinement of a city, but offered his youngest son 'Kumbur' to their notice, as one for whom he had not made any provision, and who was therefore free from those ties which bound his brethren to their homes. After much urging, 'Kumbur' consented to become their Chief, the Tajuks stipulating to furnish him with eighty horse as a body guard, to build a house, and supply him with every necessary of life. After a few years, 'Kumbur' forced the several tribes of Moguls and Baloochees in the neighbourhood of Kelat to acknowledge his supremacy, and in process of time the whole of Mukran and Northern Kunchee was ruled over by his descendants.

'Braho' had seven sons :

1 Meerun,	from whom are descended the Meeranees.
2 Simael	„ „ Simalanees.
3 Roden	„ „ Rodenees.
4 Peerak	„ „ Peerkanees.
5 Yug	„ „ Yugur Menguls.
6 Khadr	„ „ Khidranees.
7 Kumbur	„ „ Kumburanees.

These are the real Brahoee tribes, but many others subject to them, are now included in that appellation.

They are,

Tribe.	Subdivision.	Bigin.	Place of abode.	Estimated No. of families.	Present Chief.	Remarks.
Saraban, ...	Reisancee ...	Mogul ...	Kuhnuk ..	300	Asud Khan.	The Sarabans, or those of 'the right hand' held Inams and Jagheers from the Kelat Khans on whose authority they considered themselves dependant.
	Shahwanee ..	Bulooche ..	Moostoong.	1,000	{ Mahomed Khan.	
	Burpurra	Mogul	Kurdugan ..	12,000	Synd Khan.	
	Bungoolrye ..	Syuds	Tepulinjee ..	2,000	SherMahamed	
	Mahomed Shahee }	Mogul	Moostoong.	1,000	Deenar.	
	Koord.....	Ditto	{ Duabt - i - be Dowlut }	400	Loll Buksh.	
	Lahree	{ Rind Bulooche }	Nagao.....			
	Rind	Bulooche ..	Makron	12,000	{ Loll Buksh. Bulooche Khan.	
Jhalaban ..	Zahree	Mogul	Gatt.....	3,000	{ Meer Say Mahomed, Meer Baker.	The Jhalabans, or those of 'the left hand' were Zumeendars who yielded by slight obedience to their ruler, their lands being hereditary.
	Mengul	Bind	Nall.....	2,000	PraheemKhan	
	Mahomed Hoosainee }	Mogul	Kohpoosht.	30,000		
	Beegunjaw ..	Prind	Wud	500	Kuhrer.	
	Zugur Mengul	Brahooes ..	Nooshky ..	1,000	Ahmud Khan.	
	Mughee	Bulooche ..	{ Jull and in Mukran. }	12,000	Ahmud Khan.	

A three weeks sail in search of Health—Province of Arracan—Kyok Phyoo. —Its Harbour, Productions, Capabilities, Geological features, Visit to an active volcano. By HENRY HARPUR SPRY, M.D., F.G.S., &c., Secretary to the Agricultural and Horticultural Society of India.

Circumstances rendering it necessary that I should have recourse to a little relaxation, in consequence of a severe attack of illness, I determined to take advantage of the sailing of the H.C.S. Amherst, to the coast of Arracan, on the 19th of last month (Feb. 1841) to secure a passage in her and visit the port of Kyok Phyoo, at Ramree. The ship left Calcutta, in tow of the Ganges, Government Steamer, and reached the Sand Heads at the close of the third day. Thence we proceeded under sail, and at the expiration of four days, dropt anchor in the picturesque, and most spacious harbour of Kyok Phyoo. We were there in exactly a week from Calcutta. The cruize from the Sand Heads across to the coast of Arracan, was a most delightful one. The wind was gentle, and the sea so smooth, that out of a party of 400 sepoys and camp followers who were on board, only two that I am aware of, underwent the miseries usually attendant on a sea voyage when undertaken for the first time.

On the morning early, of the day preceding the one on which we arrived, land was visible, and the entire day was spent in coasting along the

mountainous, rugged, but thickly wooded islands, called the Bolongas or broken islands. As night closed in, the anchor was dropt about a league outside the harbour of Kyok Phyoo.

There are two or three 'dangers' in the passage way, and it becomes therefore desirable, that day-light should exist while steering through the harbour. On one occasion, however, the Captain of the *Amherst* stood in on a bright moon-light night and took up his right position without the occurrence of any accident. With the exception of the rocks here alluded to, the entrance of the harbour is deep and spacious.

I confess, as we sailed in, early the next morning, the general appearance of the harbour and scenery surrounding it, created a most favorable impression. The first object which attracted my attention was the Saddle Island. It stands on the south side of the entrance of the outer harbour, (there are, as it were, two harbours) is about three quarters of a mile, or a mile in circumference, and has a peak of about 120 or 150 feet in height. On it, a neat bungalow has been built by the present Marine Assistant, Captain Brown. Here it has become the fashion of late, for parties of pleasure to resort, to pass the day in the agreeable occupation of shell picking, coral gathering, bathing, ship sighting, or if it suits them better, drawing, reading, or geologizing, while the health inspiring breeze of the sea is blowing on their frames.

As the ship sails along, new and striking peculiarities claim the observer's attention, and some of the earliest of these, are, the cantonment bungalows of the officers which stud the beach at irregular intervals, for a distance of three miles as far as 'Sandy Point;' this forms the northern promontory of the inner harbour, and on it stands a two 12-pound battery, with an appropriate flag staff, under the designation of 'Fort Dalhousie.' On the land a little elevated above the sea shore, and about a hundred yards from the pebbly and sandy beach, with nothing to impede the current of the refreshing sea breeze as it comes off the ocean, are seen those cottages on piles, known as bungalows, overhung and shaded by the lofty *Dipterocarpi*; the bank on which they stand is of yellow sand, and along the beach at sunset, or in the morning, the valetudinarian may gallop without intermission on the active sure footed pony of the province for three good miles, and court the healthful breeze. A small thatched bathing house stands conspicuous. It is the resort, every morning, of the lovers of bathing, who delight to wrestle with the waves and luxuriate in the sea.

Kyok Phyoo has not reached that pitch of celebrity yet, as to call for the erection of bathing machines, but no beach in the world is

better adapted for them, if the taste of the public should ever turn that way.

The groups of large islands, covered with deep rich foliage, which form the harbour of Kyok Phyoo, rise abruptly from the sea, and afford water beside them so deep that ships can sail in safety. The hills are clothed to the top in dense and luxuriant vegetation, while the peaks of some run up to heights that are computed to extend to 7 or 800 feet.

The harbour of Kyok Phyoo, as I have before remarked, is extremely picturesque, and in its conformation and capabilities, reminds me forcibly of the one at Trincomalee—Like the latter, it is divided into what may be termed an outer and an inner harbour. The outer one being more of a roadsted than the inner, which is sheltered by the point of land on which the flag staff stands, and is safe for ships in all weathers. The harbour and roadsted, with the contiguous extensive deep bay, known as Fletcher Hayes' Straits, which stretches away amidst a series of many beautifully grouped islands between the eastern side of Ramree and the main, constitute an anchorage that I am assured would afford safe shelter for the shipping of the whole world.

With all these new and engaging features before me, it was with no ordinary feelings of delight that I stepped on shore to investigate and examine for myself. I found that a great and most beneficial change had been wrought of late in the physical condition and aspect of the station of Kyok Phyoo. The dense *low* jungle which formerly choked the cantonment grounds, had, through the active exertions of the local authorities, been effectually removed, as had the brush-wood and most of the timber trees which grew on a contiguous low belt of sandstone hillocks, which formed the south western boundary of the station. Drains for the outlet of accumulated water had also been cut, and temporary bridges erected. The last it may be expected will shortly be superseded by more becoming brick ones, as the materials, I was informed, had long been lying accumulated on the ground.

The salubrity of the place has by these measures been much improved, and the first intimation almost which I received on landing, was the gratifying assurance, that during the whole period of service (two years) that the regiment then on the island on duty had passed, not one death had occurred among the officers, or, (I believe I am correct in this) any one of them been obliged to leave it from sickness. One great and powerful complaint still exists against Kyok Phyoo as a regimental station. The Hindoostanee soldiers suffer dreadfully from

sickness. I was curious to learn, if possible, the cause of this, and the explanations which were offered me, in a great measure satisfactorily account, I think, for so unfortunate and much to be regretted an occurrence. The Arracanese or Mugs, as they are usually called, *invariably* (there is no exception to the practice that I could learn) build their dwellings on piles, so that the floor of the room is not only elevated a distance of two or more feet above the surface of the ground, but a *current of air* passes freely underneath it. At the jail, which is a series of spacious well continued erections, the system of the country has been followed, and the prisoners are housed in a number of large dwellings within a strong stockade. It is left for regimental sepoy to be experimented on, to test the value of Mug wisdom, by doing without piles and hutting the unfortunates in the manner now in use. To the men instead of being hutted as the people of the province are, and indeed *as the transported felons are*, (for Arracan is a penal settlement and Kyok Phyoo has a party of above three hundred convicts stationed at it,) are compelled to live in low or unraised huts, which are built in a series of lines forming streets, and in such a damp locality, that I (although it was then far advanced in the month of February) sprung a couple of snipe out of the grass, within a yard of these abodes.

After strong, and I believe repeated representation, not only on the part of the duly constituted medical authorities, whose business it is to watch over such duties, but by the chief Military authority also, I am told that the Military Board sanctioned the formation of raised boardings or *matchauns within the huts*, so as to enable the sepoy to sleep off the ground. But this is not enough. Whatever dampness or exhalation is emitted from the soil (and that *something* noxious does transude the practice of building, which the genius of the people has suggested, proves) is still pent up by the mat walls which reach the ground and exclude the free circulation of air underneath, an observance which, as I have just remarked, is deemed essential to the preservation of health. Common humanity dictates the measure, and a State characterized for its considerate attention to its army, ought without hesitation to hasten to remove a grievance so fully calculated to produce the suffering and disastrous consequences which are now experienced.

There is another and I think not sufficiently regarded cause operative of the suffering which the sepoy undergo from sickness, a portion of the men, in the Volunteer regiments are Mahomedans. They are proverbial for their careless extravagance. 'A Mahomedan (said Ameer-ul-omrah the second son, and for some time minister of Mahommed Ali the

former Nabab of the Carnatic) was like a sieve—much of what was poured in went through; while a Hindoo was like a sponge which retained all, but on pressure gave back, as required, what it had absorbed.' And so at Kyok Phyoo. The Mahomedan sepoys to gratify their habits of debauchery, borrow from their more thrifty Hindoo brethren who *stint themselves of the common necessities of life* to gratify their saving propensities, and rather than purchase good sound, but expensive food pinch themselves with half meals of the worst description. The Hindoo sepoys of the 65th regiment brought away with them, I was assured by the officers, on their return to Calcutta upwards of 40,000 rupees which they had saved during their two years and half tour in the Province.

Leaving this painful subject for others of a more pleasing kind, I hasten to complete my observations regarding the site of the Cantonment of Kyok Phyoo. The soil is almost entirely sand, but yet much vegetation till recently abounded and even now the many lofty *Dipterocarpi* speak plainly of the adaptability of the ground to produce rich and luxuriant growths. These *Dipterocarpi* early attracted my attention. They are the trees, whence that (to the London market at least) novel article of commerce, known as the Gurjun or wood oil, is obtained. On examining into the process by which this most valuable product is obtained, I found that the practice was to cut a large notch something of the form of a rude arch into one side of the tree near its root, a depth of three or four inches, with the base sunk from the external edge inwardly to make it cup-like, so as to hold the oil. A fire is then kindled in the aperture for a few minutes, by which means, it appears, the sap vessels are stimulated, and the oil once set an oozing flows gradually down, drop by drop, till the cup-like hollow at the bottom of the notch becomes filled, when it is dishd up, and set aside for use; successive supplies are for a long time in this manner obtained.

An abundance of these trees are to be seen in every direction about Kyok Phyoo, and I am told are equally plentiful on the island of Cheduba and elsewhere throughout the line of coast. While on the subject of these trees I cannot omit mentioning a circumstance connected with the produce from them, which although of somewhat a private nature, is yet of sufficient peculiarity to merit recital. More than two years ago, when in correspondence with Dr. Royle, I procured eight large casks full of the wood oil and shipped it for London to be sold in the London market and its value fairly tested. I knew that the Portuguese in the days of their early career in India had all dealt largely in the article, for Bolt in his 'Considerations of India,' particularly alludes

to it. I knew moreover that for time out of mind the people of the Province of Arracan and of Burmah in general, had used it for all sorts of work; that moreover Roxburgh alludes to it, and that in fact it was an article well known in India. What was my surprise at finding from Dr. Royle that so ignorant were, and still are, the authorities at the London Custom House of the nature of this substance, that they positively deny that it is a raw material, and will consequently only admit it as a '*Manufactured article*', which entails the payment of a duty that the oil itself would never sell for. In his recently published work on the productive resources of India, Dr. Royle has pointedly alluded to this lamentable ignorance on the part of the London Custom House authorities of some of the products of India.

To return to remarks on the station. The bazar is clean and well arranged. Beside the various roads young timber trees have been planted. These are not in the most flourishing condition. It may surprise some to be told that after so recently denuding the soil of the jungle, that trees should again be planted, but arborescent avenues would be a great ornament, serve to keep down temperature, and not to promote sickness. Many of those now planted are dead and it will be many years before any will assume a commanding appearance.

The people are decidedly superior in physical conformation to the Bengallees. They are an athletic and intelligent race. Their agricultural and mechanical appliances show it, and in their dealings with the Europeans they evince an independence of character that surprises a person accustomed to the manners of the obsequious Asiatic.

The harbour abounds with fish, and I was particularly struck at the ease and facility with which a daily supply was obtained for breakfast. Half an hour before the usual time for eating the meal the word was passed for '*Mutchee mar*.' At which command the boatmen took the net and proceeding to the beach threw in the lines, and in ten minutes three or four fine mullet were presented to the cook.

Besides these mullet, the pomfret are noted for their high flavour, and the oysters are of an excellent kind. At certain seasons, at the close of the rainy months, innumerable boats go off to Combermere Bay, an extensive but somewhat shallow roadsted, contiguous to Kyok Phyoo harbour, and here fish for the polynemous, the sounds of which they cure in large quantities, and sell to the China junks which annually pay a visit to the coast for the purpose of trading for these and other articles. It is the opinion of a gentleman, who has had opportunities of making abundant enquiries, that the fishing for isinglass might be conducted to a great extent.

Only the day before I arrived, a Chinaman, (the only one indeed who lives at Kyok Phyoo) who acts as agent for his countrymen who trade on the coast, bought up five maunds (400 lbs) of these fish sounds for about 25 rupees a maund.

A small rock, known as the Pagoda Rock, at the mouth of the harbour, furnishes the edible birds' nests in small quantities, and the government derives an income from it as well as from wood oil, wax and honey. In the year 1835-36, the collections of revenue on account of the edible birds' nest found at the island of Ramacee stood at 106 rupees and that for the whole Province at 4160 rupees in the Government books, while the collections on account of form of wood oil was 17 rupees—eath oil 162 rupees—bees wax and honey 660 rupees. The nests the China junks carry off. Such are the chief productions of the harbour. Many other fish of course abound, but the pomfret, the mullet, the becttee, and the oyster stand foremost.

I must now allude to another subject, and that is one of considerable importance. I allude to the manufacture of salt. The water of the harbour at Kyok Phyoo contains a much larger quantity of saline matter than that in the Sunderbunds. On comparison it will be seen, I believe, that the one holds near 20 per cent more saline matter in solution than the other. The government has already taken advantage of this circumstance, and has caused Golahs to be erected, whereat they store salt, which the people of the Province are but too happy to supply at 4 annas a maund. The manufacture is solely by solar evaporation, and the preparation is of the finest quality. Such opportunities must demand greater attention, and a few years more will probably see this superior article, superseding, almost to utter extinction, the dirty earthy article which is now obtained from the Sunderbunds.*

One of my earliest enquiries, after landing at the picturesque station of Kyok Phyoo, was, to enquire into the progress made in the recent coal discovery.† I found that the principal locality here alluded to, was not on the island of Ramree itself, but on a rock off the island about a mile, know by the name of 'the Cap Island,' but that minute traces of it had been found at a point of the main island which is nearest in contiguity

* * My friend and correspondent alludes to the Salt as sold in the bazaar: it is perfectly white, and pure when first made, but the process of removal, and weighing dirties it in some degree and the adulteration by the retail dealer brings on the earthy look he alludes to: 7, not 4, As. is the price given.—H. T.

† I beg here to state that what is here stated regarding the coal localities at Kyok Phyoo was reported by me to the Secretary of the coal Committee and has since appeared in Dr. McClelland's Journal.

to this rock. The specimens, which I brought away will afford good average pieces of coal and its immediate connected formations. I took an early opportunity of availing myself of the kind offer of Mr. Brown, the Marine Assistant to the Commissioner of the province, and Col. Hervey, to whose exertions this interesting discovery I believe belongs, to visit the Cap Island and examine the formation. I found it partaking, as might be expected, when the general character of the line of coast is taken into consideration, of all the characters which denote active volcanic agency,—The rock itself is in great part made up of sand-stone, but so distorted are the strata by the upheaving force, that in places they appear at an acute angle, and even vertical, while they are so appositely placed as to convey the idea, that at this point some confined force had here found an outlet, and split the incumbent bed. The rock runs up to a peak.

On one face of the rock a thick deposit of marly earth is seen, and on it an abundance of vegetation thrives. At the seaward point of the rock, and barely above high water mark, the coal is found. The sand-stone strata here, though not so highly distorted as in the more central part, is still at an acute angle. It is intersected by a bed of fatty marl of about a foot in thickness, and amidst its substance, and sometimes in a shaly deposit, the lumps of coal are found. I say lumps for as yet no continuous seam of coal has been discovered, but all is yet in its infancy, for, besides scratching the surface soil for a few inches, nothing has been done to test the extent of the formation.

I confess, when I look at the position of the place, I see no immediate prospect of a supply of coals; and taking the difficulties of keeping out the water into consideration, (even supposing that a continuous seam was found) with the great dip of the strata, nothing but an outlay for machinery could fairly test it.

Leaving the Cap island, the next locality that I visited, was the point of land on the island of Ramree, most contiguous to the Cap island. From the direction of the outcropping coal strata at the Cap island, it was inferred that similar indications might be found at the point of land now adverted to, and a close search being made, a formation identical with that at the Cap island was found with thin traces of coal. The dip here is equally great with that at the Cap island, and would require a shaft to be sunk, through the intervening sandstone stratum, to enable the searcher to ascertain if a bed of coal of any consistence did exist.

When I came away Captain Lumsden, the Principal Assistant, was sinking two pits at a part of the island, some little way, perhaps half a

mile, from the spot where the indications of coal were observed, and the laborers had got perhaps ten feet;* but no effectual effort is likely to be made, nor indeed, is it possible under existing circumstances, for it appears that no expense is permitted to be incurred, while of machinery—not even a whim for raising the rubbish or water is erected.

Every disposition exists on the part of those in authority at Kyok Phoo, to carry out the investigation, but they say, and say justly, that they have no funds placed at their disposal for doing so, and, out of their own pocket, it is too much to expect that they should defray the charges. The consequence is, the poor laborers are left to go unpaid, and great dissatisfaction is felt accordingly.

To leave this subject. After visiting the localities now mentioned, a proposal was made to sail across the harbour to the eastern point of the island, and proceed to the summit of a lofty hill which stood about three mile inland, and on which is the cone of an active volcano. The suggestion was immediately acceded to, and at four o'clock in the afternoon our party began to ascend the rugged path which conducted to this interesting object. I had heard that two or three other Europeans had already visited the crater, and that at the close of last year it was emitting smoke and ashes. Our companions were several boatmen, and each man, more from habit than singularity, carried, the never failing accompaniment of a mug a *dhow*, which is a large powerful knife in shape about the size of a regulation sword broken of in the middle.

After various humorous adventures, in the midst of the dense jungle, and traversing the crater of a small dried up volcano, we succeeded in reaching the anxiously sought hill, and when we reached the top, most amply rewarded we were. Never did I behold a more delightful piece of scenery. The view commanded the whole of the northern portion of the island, and that extensively sheltered anchoring ground, before alluded to, under the name of Fletcher Hayes' Straits.

But to the immediate objects of our visit. The cone was beautifully formed of the erupted mud, and covered to the very brink of the centre with thick verdant grass. Out of it grew luxuriant *Casuarina* trees. And here I cannot avoid mentioning a very remarkable circumstance connected with the appearance of these trees. Nowhere, as far as I could learn, do they appear, except on the cones of the volcanos, of which there are several, to be found on the island of Ramree. More than once when hid

* I have since heard from Captain Lumsden that the work has been abandoned as hopeless.

amidst the dense foliage of the forest, and at a loss in what direction to turn, we sought an open space and searched for the Casuarina trees, and in this manner were attracted to the desired spot. On the edge of the crater and about the sides of the cone amidst the grass, I picked up shells, (helix ?) pieces of indurated clay, quartz, and clay intersected with spar. They all go to show the character of the disrupted material. The edge of the crater was most uniform, and its diameter was about twelve feet. Its interior was filled with warm liquid mud, and on plunging down a rod, it passed on for about eight feet, and then struck in a thick plastic substance. After examining it in all directions, and satisfying our curiosity to the utmost, we hastened to return, and at length succeeded in reaching the boats, highly gratified and delighted at the success of our adventure, and the interesting novelty which it had unfolded to us.

I left Kyok Phyoo much pleased with the peculiar and many various features which it presents, and returned to Calcutta after an absence of three weeks, much improved in health by the excursion.

Description of some Ancient Gems and Seals from Bactria, the Punjab and India.

1. GRECIAN.

Whether it is, that the collection and study of ancient gems and seals, is less interesting in itself than the study of coins, or that it leads to less immediate and satisfactory results, I am unable to say; but perhaps both of these reasons may have combined to render the one less attractive than the other. But whether from one or from both of these causes the effect has been the almost total neglect of this study in India; although the specimens scattered amongst the numerous individual collections must now be valuable, as well as easily accessible. Some of these I have collected together in the accompanying plate, in the hope that others may be induced to make public what they may have stored up in their cabinets.

The earliest notice of an ancient gem procured in India, of which I am aware, is in Vincent's *Ancient Commerce*, vol. 2, p. 760, where he makes mention of 'an emerald belonging to the Archbishop of York, engraved with a Medusa's head, of Grecian sculpture, and brought from Benares.' And in the *Trans. of the Royal Asiatic Society* vol. 3, page 139, there is an engraving of 'an ancient Hindu intaglio,' with a long rambling description, by Colonel Tod. The gem itself is a beautiful one, representing Hercules

naked, his head diademed, leaning his left hand on his club, and holding out in his right hand a little figure of victory, which is extending a wreath towards the hero; to the right are two Sanscrit letters, one above the other, in the same position, and apparently of the same age, as those we see on the coins of the Guptas, forming the word *Aja*; which is probably only a monogrammatic contraction for *Ajaya*, the invincible, a very appropriate epithet for the ever victorious Hercules.

I have no doubt that many other notices of ancient gems procured in India may be found with a little search; but I have neither the time to look for them, nor the ability to elucidate them, should my search be successful; and I therefore trust that the brief remarks, which I am about to make, may be received with indulgence.

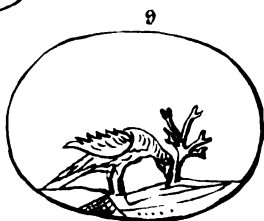
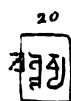
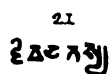
No. 1. Brown translucent agate, procured at Benares. Bare and bearded head of Hercules to the left, his hair short and curling; his great strength shown by his short brawny neck; and his club placed behind his head. This seal is of beautiful workmanship, and in exceedingly bold relief and the engraved parts are highly polished.

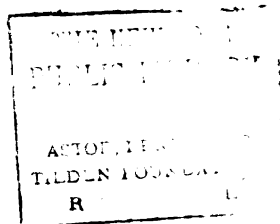
No. 2. In Colonel Stacy's collection, purchased, I believe, at Delhi. It represents Omphale standing, inclined to the left, and bearing the club and lion's skin belonging to Hercules; she having given him her distaff and bright colored robe in exchange for them. The engraving of this gem is well-done, but it is not in my opinion at all equal to the other—and yet her air of fancied strength assumed with the spoils of the Nemean lion, and the hero's club, is capital; and the making her grasp the club with both hands, displays at once both the woman's weakness, and the nice observation of the artist.

As these gems represent mythological persons of ancient Greece, they must have been brought into India from the North West, and as many gems are yearly discovered in ancient Bactria, I have little doubt that these, and indeed all gems purchased in India which bear Grecian subjects, must have come originally from ancient Bactria, the seat of the nearest Grecian colony, and where we know, from the beauty of the earlier Bactrian coins, that the arts must have flourished in the greatest perfection.

If these gems then owe their origin to Bactria, it is not improbable that the two just described may have been engraved during the long and prosperous reign of Euthedymus, all of whose gold and silver coins, yet discovered, bear the figure of Hercules; for it is but natural to suppose, that a Prince, who for so long a time exhibited this deified hero upon his coins, would likewise have had the head, the figure, and even the history of the

GEMS and SEALS





same personage engraved upon his seals.* Such at least is my opinion, which is greatly strengthened by the beauty and depth of the engraving, and by the peculiar mode of representing the short curly hair, which is the very same style that we see upon the tetradrachms of Euthydemus.

No. 3. A red cornelian, much worn and slightly fractured below, having a bare youthful head to the left, with a scarcely perceptible beard and long curling hair, with the chlamys fastened upon his shoulder. The execution of this seal is very beautiful; and the relief is bold, deep and highly polished. It was procured at Lucknow, but I am not sure that it may not owe its origin to modern Europe; the antique chlamys, however, gives it a delightful claim to be considered ancient, which the beauty of its workmanship makes me unwilling to dispute.

No. 4. A small red cornelian, purchased at Amritsir. Its execution is very inferior, and shows that it must belong to a declining period of the arts in Bactria. It represents Mercury half turned to the left, with his chlamys or short cloak over his shoulders, his caduceus in his left hand, and an undecided object in his right hand.

No. 5. A Sûlimâni, or light brown translucent agate, having a middle layer of milkwhite chalcedony, from Benares. It is of excellent make, but is very much worn, only a few strokes of a long inscription being now visible. On it are represented two standing figures, male and female. The female to the left is clothed to the feet, her head is surmounted by a basket, and encircled by a halo—she holds in her left hand a cornucopia, and in her right a torch, under which is an undecided object, resembling a bird. To the right the male figure is clothed to the knees,—his head dress is surmounted by a pair of wings, and his head encircled by a halo: he holds a trident in his left hand, and his right hand is raised towards the cornucopia held by the female figure. Between the two figures is a pitcher, and over them an indistinct object.

The two figures on this gem are, I believe, from their peculiar emblems and attributes, Osiris and Isis, or the Sun and Moon, as deified by the Egyptians. Though the worship of these divinities was popular enough in later Rome, yet I think it was never so amongst the Greeks, and more especially not amongst the distant Greeks of Bactria; wherefore I am

* Since writing the above, I have received from Capt. Hay, impressions of two copper coins of Demetrius, both of which have the head of Hercules bare and bearded as on this seal, and with the club behind the head. I am therefore inclined to believe that the bare and bearded head on the copper coins of Euthydemus is that of Hercules. The discovery of these coins of Demetrius bearing precisely the same type as the seal, in my opinion almost confirms the correctness of what I have advanced as to the period when this may have been executed.

led to suppose that this stone may have been engraved in Egypt during the fostering and happy government of the earlier Ptolemies.

No. 6. A red cornelian, of barbarous execution: Two standing figures, male and female, with a cross between them, the male figure holding up a wreath in his left hand. Though this is probably the work of modern days imitated from an antique, yet many seals of equally barbarous workmanship are yearly found in ancient Bactria, all of which most probably belong to the latest period of the Grecian dominion in that country.

No. 7. A white cornelian of milky hue, very thick and round, having a hole pierced from the top to the bottom. It represents a male figure standing to the front, his face turned to the right, he is clad in the Indian *dhoti*, and wears the sacred thread across his breast; flames spring from the top of his head, which is encircled by a halo. In his right hand he holds a trident, and in his left hand, which is placed on his hip, he carries a *lota*, or drinking vessel; and a loose robe, or *chadr* hangs over his left arm. Legend to the left in Bactrian Pali characters 𑀧𑀸𑀓𑀾𑀢𑀺 which is probably some compound of *jus* (Sanskrit यजुः) fame; such as *Jasvatisa* (for यजुस्वती) 'of the renowned.'

This beautiful gem came from Cabool: the execution is good, and the design graceful; the position of the body is easy and unrestrained; the limbs are free, and the outline of the figure and the folds of the drapery are naturally and simply expressed. The figure is the same as that we find on the coins of the Indo-Scythian Kadphises, excepting that the face is turned in a contrary direction. The Indian *dhoti*, and the sacred *poita* of the superior castes are so distinct on this gem, that I cannot hesitate in ascribing its origin to India, and in assigning it to the period when the Indo-Scythian Kadphises reigned over the Punjab and Cabool. In execution this seal is decidedly equal, if not superior, to the finest gold coins of Kadphises, and I cannot therefore be far wrong in attributing its age to the reign of that Prince, who must have flourished before Kanerka; for the money of the latter became the type of several series of the Indian coins down to so late a period as the Mahomedan invasion: while the coins of Kadphises were not imitated except by his immediate successors, who may have issued the barbarous gold coins with a man and bull on the reverse, (see Figs. 45, pl. 38, vol. 4, J. A. S. of Bengal.)

On a few gold specimens, and on all the copper coins of Kadphises, the figure which we see on this gem, is represented standing before a bull, and not alone, as on the commoner gold coins of that Prince; and this is also the way in which the Deity is placed on the gold and copper coins of the

unknown priase, noticed above as being one of the successors of Kadphises. On those coins we invariably find the legend OCPO. which is no doubt the name of the figure; and consequently we may pretty safely take this word OCPO to be the equivalent of the Bactrian Pali legend of the gem. Now Professor Lassen has happily explained *Okro*, by *Ugra*, a name of Siva, of whom indeed the trident and the sacred bull *Nandi*, are peculiar and unmistakeable attributes: and hence it follows that the figure on the seal must be that of the God Siva.

No. 8. A Cameo, in the collection of Sir Alex. Burnes, of most admirable workmanship, in bold and beautiful relief. It represents a half length of Silenus to the right; his head bald and bearded, and bound with a wreath of vine leaves; with a flat nose, sparkling eye, and laughing, all betokening the merry companion of Bacchus. He is holding up his left hand before his face with the fore-finger, and little finger raised, and in his right hand he is carrying his drinking can in a sloping direction. A thyrsus is placed behind him, and his robe is thrown over his right arm.

In this exquisite little gem Silenus appears, cup in hand, telling some humorous story, replete with the wine-inspired wit, broad fun, and shrewd pithy remarks for which he was celebrated: the sly expression of his face is excellent; and his jolly corpulent figure reminds us at once of 'laughter holding both his sides;' while the sloping way in which he holds his cup shows either that it is empty, or that he is so tipsy, and so taken up with his story, which he is impressing with the action of his left hand more earnestly upon his hearers, as not to know that he is losing his wine; or we may suppose that, having drained the cup, he is exclaiming 'Papaiapœx!—what a sweet taste it has!'

The exceeding beauty of this exquisite little Cameo of the Grecian Falstaff, proves that it must have been engraved at a time when the arts in Bactria were in the very highest perfection; and consequently during the earliest period of the Bactrian power: and I think it highly probable that this gem may have been executed during the reign of Agathocles, whose coins usually exhibit devices belonging to the worship of Bacchus; and no doubt upon his seals and gems there were represented stories and figures emblematic of the same worship.

The coins of Agathocles, are, in my opinion, the most beautiful of the Bactrian series as works of art, and therefore I am inclined to place him before Euthydemus and Demetrius in the list of Bactrian Princes; and to assign him the country of the Parapamisades as his kingdom, Nysa or Dionysopolis for his capital, in which 'City of Dionysus' I suppose

that this beautiful Cameo of Silenus was engraved, at the same time that the Bacchic coins of Agathocles were united ; that is about 240 B.C.

No. 9. A red cornelian, in the collection of Sir Alex. Burnes. It is of coarse execution, although its design is good ; and is probably only a copy of a better gem.

No. 10. Likewise in the collection of Sir Alex. Burnes ; this seal is of very inferior execution ; the subject is similar to that of the coins of the Grecian colony of Falisci in Italy.

2. SASSANIAN.

No. 11. A red cornelian, from Amritsir, very thick, and with a hole near the top for suspension ; the two streamers to the right are just the same as those that we see upon the Sassanian coins.

Nos. 12 and 13. These were sent to Mr. Prinsep by a gentleman residing in Persia ; on No. 13 there is a Pehlvi inscription, but I am not able to offer any thing myself regarding its interpretation.

No. 14. In the possession of Colonel Stacy.

3. HINDU.

In the Journal of the Bengal Asiatic Society for 1837, at page 968 Mr. Prinsep says—' General Ventura has also brought down with him some beautiful specimens of seals of the same age, which I shall take an early opportunity of engraving and describing.' Unfortunately this opportunity was lost by Mr. Prinsep's sudden illness. He had however sent me an impression of the principal seal referred to, (No. 15) which I will now describe.

No. 15. A plain thin cornelian, bearing a beautiful female head to the right, the hair plaited in two braids over the fore part of the head, and gathered into a large bow at the back, where it is tied by a ribbon, the ends of which float behind. Her shoulder is covered by a robe, from the midst of which her right hand appears, holding a lotus flower before her face. Inscription below in ancient Sanscrit, *Késava-Dásasya*, (Seal) of *Kesava-Das*, the servant of Vishnu.

At what period this lovely gem was engraved can only be ascertained approximately by an examination of the forms of the Sanskrit characters ; of which the letters *k* and *d*, and the inflected vowels are similar to those found in the inscription recording the repairs of the bridge near *lúnagurh*, which we know must be subsequent to *Asoka*, or after B.C. 200 ; while the *s* and *sy* are of a later period, and similar to those found in the inscriptions of the Gupta family, which, in my opinion, cannot be later than A.D. 400. The peculiar formation of the *sy*, I consider to be one of the

best tests for ascertaining the age of a Sanskrit inscription, and therefore I feel inclined to believe that this seal is of the age of the Guptas. If the name may be considered as a title declaratory of the religion of the owner of the seal, we shall have a direct proof that *Késava Dás* (the servant of Vishnu) was of the Braminical faith; which, coupled with the probable age which I have already assigned to this seal, would fix the period of its execution to the reign of one of the earlier Vaishnava Guptas, and before the date of the Saiva Skanda Gupta. In the same way, taking the name as a declaration of the faith of *Késava Dás*, we have a clue to the owner of the beautiful face engraved upon this seal, who can be no other than *Sai* or *Lakshmi*, the consort of Vishnu, and the goddess of wealth, beauty, and prosperity, who is usually represented with a lotus in her hand. It is even possible that this seal may have belonged to Chandra Gupta himself; for the small copper coins of that Prince (vide vol. 5. pl. 38. Fig. 13 and 14. J.A.S. of Bengal) bear a similar bust with the hand raised before the face, and holding a lotus blossom; beneath which is the Prince's name. This remarkable coincidence of subject between the seal and the coins, coupled with the similarity of the characters of the inscription to those of the age of the Guptas, still further strengthens the opinion which I have expressed above, that this seal was engraved during the reign of one of the earlier Vaishnava Guptas, towards the end of the fourth century after Christ.

The lithographer has completely failed in copying my sketch of this beautiful seal: for, instead of a frowning elderly lady, the original represents a young and lovely girl with a gentle smile upon her face. In beauty and excellence of workmanship this gem rivals the finest coins of the Bactrian Mint; the face is exquisitely delineated, and the position of the hand peeping out from the loose robe or Hindu *chadr*, is graceful and easy. Unfortunately on the gold coins of the Guptas there are no busts with which we may compare the delicate engraving of this seal; in my opinion, however, it is far superior to many of the Gupta coins, and is perhaps even superior to the best of them; with the small copper coins no just comparison can be made, for they are few in number, and are all deficient in preservation.

No. 16. A brooch set round with turquoises, presented to Mr. James Prinsep by General Ventura. The engraving is from a rough pen-and-ink sketch by Mr. Prinsep—Below the head is an inscription in ancient Sanskrit, *Sri Kodbharasya* '(Seal) of Sri Kodbhara, the upholder or supporter of the fortress'. The initial *Sri* of this seal, which is of a later form than we find in the Gupta inscriptions, proves that

it must have been engraved subsequent to A. D. 450, the latest period which I can assign to any of the Gupta family.

No. 17. Likewise in the collection of General Ventura, there is a head upon this seal, but not so beautifully executed as that upon No. 15. The inscription, in ancient Sanskrit, is *Ajita Vermmasya*, (seal) of Ajita Vermma. From the forms of the characters I should say that this seal was of the age of the Guptas.

No. 18. A red cornelian, in the possession of Mr. B. Elliott of Patna. This seal is very neatly engraved, and is no doubt as old as the most flourishing period of the Guptas, and perhaps even older. The legend of this seal will be found engraved as No. 15. pl. 56, vol. 6. J. A. S. of Bengal, where Mr. Prinsep reads it as *Sri Lokanāvasya*, (seal) of Sri Lokanava, or, the boatman of the world: but on the sealing-wax impression, which I have now before me, the legend is clearly *Sri Loka-chhāvasya*, (seal) of Sri Loka-chhava, or the ornament of the world; from *रुवि* beauty or splendor.

No. 19. A chalcedonic agate, or *Sutimāni*, from Ujain, in the cabinet of the late Mr. James Prinsep. It is published in the J. A. S. of Bengal, vol 6. pl. 36, Fig. 23, where Mr. Prinsep reads the inscription as *Sri Vati-khuddasya*. '(Seal) of Sri Vati-khudd.'*

No. 20. A small agate, having the letters cut through an upper layer of milk white chalcedony. It was originally in Colonel Stacy's collection, and is evidently only a fragment, for on the left side marks of the cutting tools are still quite plain, while the other sides are polished. The left side is likewise perpendicular while the other sides are sloping towards the face of the seal. The remaining letters in ancient Sanskrit are.....*ttasya*. '(Seal) of.....(Da) tta.

No. 21. In the possession of General Court. It is an oblong seal, with a recumbent animal above the inscriptions, which is in ancient Sanskrit, and reads *Tiva-datasya*. '(Seal) of Tiva Datta,' or, the giver of wisdom.

No. 22. A copper seal, originally in the collection of Colonel Stacy, having a Bull butting to the left, with an ancient Sanskrit inscription on two sides, which is probably *Amogha-bhūtasā*. '(Seal) of Amogha-bhuta', or the mortal without vanity, that is, the humble individual. Now this the very title which Rajah Kunanda takes on his silver and cop-

* Of the same age as this seal is another small oval one from Peshāwur, (brought to my notice by Dr. Chapuan) bearing the legend *Sri Kshatrapasya* '(seal) of Sri Kshatrapa' or the fortunate satrap.

per coins (see Nos. 2, 3, 4 and 7, vol. 7. pl. 32, J. A. S. of Bengal) the whole inscription being *Amogha-bhutasa-maharajasa-rajnya-Kunandasa*, (coin) of the humble individual, the great king of kings, Kunanda. In the same way we find that the title of Aprati-ratha, or the invincible-in-his-chariot, which is applied in the Allahabad inscription to Samudra Gupta, is repeated upon his coins :—and I have no doubt therefore that the epithet of Amogha-bhuta on this seal refers to Kunanda, and that the seal is of the same age as the coins. But on the coins the legends are in two different characters, of one common language ; the legend of the obverse being in Indian Pali ; thus proving that these two characters were in contemporaneous use, and likewise from the occurrence of the *Indian* Pali on the *obverse*, or principal side of the coin, showing clearly that Kunanda was a native of India proper, and not of India beyond the Indus where the Bactrian Pali characters prevailed. The same fact indeed may be gathered from the use of *Indian* Pali *only* on the seal. But that he possessed territory upon the banks of the Indus is undeniably attested by the use of the *Bactrian* Pali upon his coins, and by the localities in which they have been discovered, some of which are to the westward of the Indus, even as far as Kabul. Such being the extent of his territory, it now only remains to ascertain at *what period* a prince named Kunanda reigned over Northern India and the Punjab. In the first place then we know by the shape of the letter *m* that this seal must be anterior to the period of the Guptas, and the same may be said for the coins, on which also we have the additional evidence from the forms of the *h* and *n*, that Kunanda cannot be later than Asoka. The occurrence of Bactrian Pali on his coins is likewise in favor of this early date, for that character appears to have fallen into disuse towards the close of the second century after Christ, or perhaps a quarter of a century later, when the followers of the Brahminical faith, with the assistance of the Agniculas (whom I believe to have been the fire worshipping Sussanians) had gained the ascendancy in India over the votaries of Buddha. The use of the Pali termination *Sa*, for the Sanskrit *Sya*, proves that Kunanda was a Buddhist, and this is still further confirmed by his title, which whether it be read as *Amogha-bhuta*, the humble mortal, or as *Amāya-bhuta*, the guileless mortal, which is perhaps the preferable reading, is in strict accordance with the professed meekness and lowliness of a zealous Buddhist, and is at the same time utterly at variance with the grandiloquent titles assumed by the arrogant Brahmanists. We have thus deduced that Kunanda, who ruled over Northern India even beyond the river Indus, was a Buddhist Prince, and that he flourished certainly not later

than the reign of Asoka. Now it is almost certain that the successors of Asoka were driven out of the country upon the Kabul river by the Bactrian Greeks under Demetrius the son of Euthydemus, and it is quite certain that from the period of the war between Eucratides and Demetrius 'King of the Indians,' until the decay of the Indo-Scythian power about A. D. 220, no Hindu Prince ruled over the territory on the banks of the Indus. We have thus two distinct proofs that Kunanda cannot have flourished later than the era of Asoka, and since we cannot identify him with that prince whose other name was Piya-dasi, we must look earlier in the list for some king whose recorded history will agree with the deductions made from our examination of his seal and coins. The name given in the Grecian authors to Asoka's father is Amitrochates, which can only be the corruption of some title assumed by Bindusara, but notwithstanding the near coincidence of sound which Amitro-chates bears to Amaya-bhuta or Amogha-bhuta, it is quite impossible to identify them, as the first was a Brahmanist, while Kunanda, as we have shown, was a Buddhist. It is equally impossible to identify him with the Brahminical Chandra Gupta Maurya; but amongst his immediate predecessors, the *nine Nandas*, the only difficulty seems to be with which of them he is to be identified. This is however a matter of little consequence, as the elder Nanda Mâhâpadma, and his eight sons reigned conjointly for one hundred years previous to the accession of Chandra Gupta, in about B.C. 312. The nine Nandas were therefore contemporaries of Alexander the Great.

Of the first Nanda Mâhâpadma it is said in the Vishnu and Bhâgavut Purânas 'he will bring the whole earth under one umbrella, his rule being irresistible.' He was therefore a powerful monarch. That he was a Buddhist however, I cannot affirm; although the following passage from Wilson's translation of the Mudra Râkshasa, would seem to countenance the opinion that the Prince and even his councillors were of that faith. See Hindu Theatre, vol. 2 pp. 159 60, where Chânakya the Brahman says,

There is a fellow of my studies, deep
In planetary influence and policy,
The Brahman Induserma; him I sent,
When first I vowed the death of Nanda, hither;
And here repairing as a *Bauddha mendicant*,
He *speedily* contrived to form acquaintance
And *friendship* with the royal councillors.
Above them all does Râkshasa repose
In him implicit confidence.

It is hardly possible that King Nanda and his councillors would have admitted a *Bauddha mendicant* to their *friendship*, had they been Brah-

manists; for there can scarcely have been less pollution to a Hindu in the friendship than in the contact of a Buddhist. The Bhāganat Purāna also says that Nanda and his successors were ‘Sudras, void of piety.’ The Vishna Purāna adds that he was avaricious; and they both agree in stating that a Brahman was the chief agent in destroying the nine Nandas. Avarice and want of piety are the usual sins attributed to any Prince who neither respects nor entertains the Brahmins; and such sins would of course be committed by *every Buddhist King*; who like Asoka would have turned out all the Brahmins supported at the royal expense and have entertained Buddhist priests in their place. I cannot therefore help suspecting that as a Brahman was the chief conspirator against the Nandas it is more probable that the rebellion was only a religious struggle for political ascendancy, in which the Brahman Kautilya succeeded in establishing the authority of his own caste and religion under the new King Chandra Gupta; than that it was a justifiable uprising of the people, occasioned by the avarice and tyranny of Nanda.

Nanda himself was called Mahapadma; his wife was called Sumanda; and his eight sons, according to the Vishnu and Bhāganat Purānas, were ‘Sumalya and others.’ To one of these nameless princes then I would attribute this seal, if not to the elder Nanda Mahapadma himself, to whom the coins almost certainly belong:—for it appears from the Rajah Taringini that the younger or junior Rajas were not allowed the privilege of coining in their own names; and therefore the eight sons of Nanda, who reigned conjointly with their father can scarcely have struck any coins:—but whether the seal belongs to the father or to one of his sons, its age is not affected by the uncertainty; and we may therefore consider it as old at least as the time of Alexander the Great.

No. 23. Copper.—This seal cannot I think be more than three hundred years old, and perhaps not even so much. The inscription in modern Devanagari is *Sri Hara Deva-ji sahāya parāmanda*. The fortunate Hara Dēva, the companion of happiness.

ALEXANDER CUNNINGHAM.

Note.—A gem identical with No. 2 of the plate supplied me by Lt. Cunningham is noted by Bayer (the first investigator of Bactrian history) as No. 37 in the splendid collection of gems belonging to Martin Von Ebermayer, a wealthy merchant of Nuremberg, which he illustrated in a very erudite work under the following title:—‘*Gemmarum Affabre Sculptarum Thesaurus, quem suis sumptibus haud exiguis, nec parvo studio collegit Io. Mart. ab Ebermayer.*’ The engravings of the collection which accompany the letter press are exceedingly well executed: a copy of the work (Fol. ed. prin.) is in my possession and now lies before me. The design, from Bayer’s note upon it, would appear to have been a favorite one; he speaks of two other gems (Thes. antiq. Græc.) not dissimilar, which Angustin held to represent not *Omphale* but *Iole*, but he afterwards abandoned that opinion, and declared the figure (as did also Begero

Mode of taking facsimiles of coins.—BY VINCENT TREGGAR, Esq.

The coin is placed between two dices of lead, and the whole compressed, either by a lever or screw, till the coin is well indented into the lead, from which latter impressions, the wax ones are made, and, being in relief, are of course far better than if taken from the coin itself.

To form the dice, a piece of plank, about one-third of an inch thick, is bored though with a centre bit somewhat smaller than the coin to be copied, it is then cut into halves, to facilitate the removal of the lead which is cast into it, the mould being placed in a piece of smooth wood, or still better, on a piece of dry brick rubbed very smooth. The bottom of the dice may not be smooth at first but will be so after a few castings have heated the brick, or it may be heated on the fire while the lead is melting. The best mould is a brass ring, the hole being bored or turned slightly conical then by merely raising it the lead falls out; it should be laid on a piece of brass nicely polished, which will give the lead a bright smooth face. A screw press is the best, but a simple lever will answer every purpose; care being taken to keep all level that the coin may sink equally into the lead, and the pressure must be removed when the edges of the lead meet or nearly so, according to the thickness of the coin. There is very little danger of injuring the coin, the lead being the softer metal, but if from any cause, the relief, for instance, on one side falling opposite a hollow or plain surface on the other, there should be a chance of deforming it, the best plan is to take each side separately, the opposite one being imbedded in sealing wax.

To obtain a perfect impression from the leaden dice they should be heated, which is most conveniently done by melting a small quantity of sealing wax* and leaving the dice on it while the wax for the impression

Thes. Palat') to be none but *Omphale*, 'accuratiore carminis *Ovidiani* consideratione inductus,' as Bayer informs us. He himself is cautious as to giving a decisive opinion, saying in his description of the gem, 'IOLE, nisi potius OMPHALE, amasia HERCULIS, cujus ea clavum, et leoninum integrumentum jocose oblatum gestat.' The identity of the design could not be more satisfactorily proved than by the 'jocose oblatum' of Bayer, compared with Lt. Cunningham's similar expression. This instance of the discovery in the East of the duplicates of gems of Grecian origin extant in the West is not the only one which I shall shortly have it in my power to cite, presenting more remarkable features than those of mere identity.

A gem (No. 4, Tab. VI.) of the Ebermayer collection is also nearly identical with No. 9, of the plate before us. It represents with better execution, a crow seated on, instead of *beside* (as in No. 9), a low shrub, in exactly the same attitude as in our gem. This may represent the crow, Bayer suggests, sacred to Apollo, 'nisi rectius censuit (l. c. 19) Gronovius, quod sit *cornix ab ilice prædicens* decantata Virgilio.' The attitude and expression of the bird fully favour the ingenious suggestion, but it is singular to find a passage in the *Bucolics* Ed. IX. illustrated on a gem from Afghanistan.

* This wax can be used to heat several seals with.

is preparing, for the latter an argued lamp is the best as it does not discolour wax, a quantity must be dropped on a card sufficient to form the seal, and then the whole re-heated and the warm lead pressed down while the wax is very hot, but not so long as any air bubbles continue to rise, and it would be better to mix the wax with a thin bit of stick, drawing it somewhat towards the centre; the lead should not be removed until the wax is quite hard, and then, if the operation has been carefully performed the impression will be found as perfect as the coin itself. I have found the common hard yellow wax of the bazaar to take the most legible impression and would recommend the use of it in preference to any other colour.

I beg to suggest that the Society make a collection of such impressions, which would be valuable as a means of reference, particularly in the case of such coins as are taken from the country. They should not be shut up in a cabinet, but placed in frames, formed of a thick plank bored with holes of a fit size and covered with a glass front fitting close to the surface of the wood—the metal of the coin might be indicated, as in engravings, by its initial letter placed between the impressions; and the legend written above it, the whole classed and arranged in chronological order as far as possible. For the sake of uniformity the Society might decide on a particular coloured wax to be used in all impressions made for their collection, and the cards used should be left uncut, to be subsequently fitted to the holes in the frames which, of course, would be all of one size.

The Society would thus have the benefit of a large collection without any expense, and I have no doubt that every one who has a collection would gladly take the little trouble required to furnish copies of his coins. I must repeat there is no danger of harming most coins, as my friend Capt. Cunningham and myself have subjected our own to the ordeal without injury.

Report on the Soda Soils of the Barramahal. BY CAPTAIN CAMPBELL, ASSISTANT SURVEYOR GENERAL.

Soda soils are very common in the principal plain of the Baramahal in the Salem District, which is bounded on the North by the Hills of Congoondy, on the East by the Jawaudy Hills, on the South by the abrupt break in the levels at the Topoor Ghaut, and on the west by the hills of Roycottah.

In extent they are generally not more than about $\frac{1}{2}$ a mile square; the

soil is sandy and incapable of supporting vegetation, no herb growing on them, but a scanty scrubby grass. In general they lay upon a bed of Kunkur, which is sometimes, as near Paulcode, of considerable depth.

These beds of soda soil are well known to the natives, who call them in Tamul, Chour Munno—and extract the soda for the purpose of fluxing powdered white quartz to make bangles with. The Dhobees also collect the earth, and by lixivating it make a solution of soda which they use in washing clothes by adding quick lime, to make the solution caustic. But so ignorant are they in general of the principle of the mode of use, that they often convey the earth sometimes fifty miles, not being aware that the labour of carriage might be decreased by extracting the salt.

The Bangle makers extract the impure soda by mixing the earth with water in a pit, and allowing it to settle, the solution is then drawn off, and evaporated by sprinkling it on cowdung spread upon the surface of a granite rock. When the cake has become about half an inch in thickness, it is taken off and is broken into pieces, in which state it is called Chour Billah and is stored in houses for use, sometimes to the amount of 400 maunds.

The Chour Billah is sold at the rate of $17\frac{1}{2}$ Rupees per ton, and contains 23 per cent. of insoluble matter, the soluble part being in greatest part all carbonate of soda with a little vegetable and extractive matter, and some muriate and sulphate of soda in small quantity. A solution of it will not crystallize in consequence of the extractive matter, and the natives are quite ignorant of the mode of crystallizing it, and do not even know that it contains a salt.

In Bengal soda soils are also found, but according to Dr. O'Shaughnessy, (*Manual of Chemistry*, page 227) it contains 15 per cent. of sulphate of soda, which salt being more soluble in hot than cold water cannot be separated by crystallization from the carbonate, and the product of these soils in Bengal cannot therefore be applied to any useful purpose unless the very expensive process of decomposing the sulphate by fusion in a furnace is resorted to.

Being engaged in an extensive chemical examination of the minerals of this district in which pure carbonate of soda is required in considerable quantity as a flux, and as the price of the salt as vended in retail at Madras is very great, it has occurred to me to endeavour to supply the want from the mineral resources of the country.

I have found by experiment that a very pure carbonate of soda may be separated from the crude soda, which the soils of Barramahal yield by simply charring the Chour Billah, or the residue, after evaporating to dry-

ness in a gentle heat, by which the extractive and vegetable matters are converted into charcoal, and can then be simply extracted by filtering, and the solution will then crystallize on evaporating to a *pellicle*. The first crystallization gives a tolerably pure soda, coloured a little by the impurities, but after crystallizing 3 or 4 times the crystals are beautifully white and transparent, and after six crystallizations, the salt is so pure as hardly to give any precipitate with nitrate of silver or nitrate of barytes after supersaturation with nitric acid, denoting thereby the nearly total absence of any muriate or sulphate.

In England great quantities of carbonate of soda are required in glass making, soap making and dyeing. This was formerly prepared from the Spanish Barilla, which contains, according to Dr. Ure, muriate and sulphate of soda, lime and albumina, and only at most 24 per cent. of soda. A large quantity was also made from kelp prepared in the Scottish Isles, but this is no longer manufactured, as it has been found that in consequence of the cheap price of sulphuric acid, soda can be manufactured by decomposing the muriate of soda (common salt) at a price which remunerates the manufacturer.

In this operation the muriate is first decomposed by heating it in leaden vessels with sulphuric acid, by which the muriatic gas is driven off and which is condensed and allowed to run to waste as of no value, the demand in the arts for muriatic acid being very small. The resulting sulphate of soda is then mixed with charcoal and some lime, and is roasted by a powerful heat in a reverberatory furnace by which it is partly decomposed and formed into sulphurate of soda, which by further heat and stirring is again decomposed and the sulphur volatilized and an impure mixture of carbonate of soda ashes, and charcoal results, which is called in trade 'black balls,' and is an article of commerce.

This impure product is then further purified by solution in water, filtering, and evaporation to dryness without crystallizing, in which state it is called 'Soda Ash' and is used by the glass blowers.

The salt is still very impure, being mixed with sulphate and muriate of Soda, and does not contain its full equivalent of carbonic acid, being in fact a mixture of caustic and carbonate of soda.

For the makers of plate glass who require a very pure carbonate of soda as a flux, to prevent the chance of the glass being discoloured, the soda ash is mixed with sawdust, and is again fused in a powerful furnace, by which it is fully carbonized and rendered capable of crystallizing. It is then dissolved in water, and is crystallized once for the use of the plate glass makers, and six or seven times for the use of apothecaries. In the

latter state it is sold for 10 pence per pound retail or 52 per cent wholesale. In this state I have found by experiment that the article is exactly the same as the product before described, and the two are therefore equally valuable.

For the plate glass makers the necessity of having the flux pure is so great, that the expensive process of decomposing common salt by pearlsh (carbonate of potash) is sometimes resorted to and the resulting muriate of potash being a little crystallizable, the carbonate of soda is separated by evaporation and crystallization.

The cost of manufacture from the Indian mineral soda cannot be ascertained but by extensive experiment, but as it will be seen that the process I have described, is very much the same as that in making saltpetre, the inference, that the expense will be nearly the same in both manufactures, may be allowed, and as saltpetre is made for 2 Rupees per maund, therefore it would seem that nearly pure carbonate of soda can be manufactured in South India for less than 5 Rupees per cent.

As the soils which yield this product, are now quite unproductive, and the time required for the manufacture is during the dry weather when the ryots are unemployed, the agricultural produce cannot be affected while the revenue will be certainly increased.

While the cotton trade of South India is so rapidly increasing, an article for export which will serve the purpose of dead weight for ballasting the ships will be much required, and as carbonate of soda is not affected by exposure to air or damp, it may be packed in bags and will be useful for the purpose.

As these soils are of limited extent, and as the manufacture cannot be carried on during the whole year, therefore the produce must always be limited, and the introduction of the article into the markets of England, cannot affect the present market price, because the quantity yielded in India can only take the place of a certain quantity now produced by the manufacturers of England, and the price will always therefore be regulated by that at which the English manufacturers can afford to sell.

On the introduction of the Indian Soda to the market of England the manufacturers will doubtlessly endeavour to prevent its sale by endeavouring to undersell it, even going so far as to sell their own manufacture at a loss, but as it has been shewn that the Indian Soda can be made for little more than 10 shillings per cent., it would seem impossible that the endeavour to exclude it from the English markets could be successful.

I have been unable to procure certain information regarding the price at which the inferior kinds of impure Soda are sold in England, but when the expensive and laborious process as above described, is considered, it seems almost impossible that any product can be made at so cheap a rate, as that procured by the simple manipulation required for the mineral salt.

I have endeavoured by sending to England samples through a commercial gentleman to make this report more complete, by being able to state the value of the article on certain grounds, but have been unsuccessful, the point appearing to depend in great measure on the import duty which will be charged in England. By the present regulations, natural alkali imported from places within the limits of the Honorable Company's charter pays a duty of 2 shillings per cent. but to ascertain the point it appears to be necessary to ship a few tons, and then try by experiment at what rate of duty the article will be admitted.

I am aware that some years ago attempts had been made to introduce Indian Soda into the English market, but which failed in consequence of the opposition of the English manufacturers, but I submit, that the soils now pointed out, yielding by single crystallization a pure Soda, were not before known, and in consequence, in the former experiments to which I refer, it became necessary to fuse the salt for the purpose of purifying it, which expensive process of course prevented a successful competition with the manufacturers of England.

Report on the Kaolin Earth of Mysore.—BY CAPT. J. CAMPBELL,

Assistant Surveyor General.

A great portion of the level surface of the table land of Mysore, is formed of a red ferruginous arenaceous earth, resembling much some of the softer varieties of the upper red sandstones of England.

This formation, which may be called for convenience 'Red Marle,' is superposed upon a continuous bed of hornblende granite, and is connected with it by a graduation, both in structure and composition, through an interposed layer of white kaolin earth which is found between the two.

The kaolin is in some places several feet in thickness, and is generally of a pure white colour, and soft greasy feel, and is sometimes mixed with a fine quartzoze sand in small quantity.

This kaolin is mentioned by Dr. Heyne, who mistook it for pipeclay.

The extent of this bed of kaolin I have not had an opportunity of ascertaining, but I know that it is found from Bangalore as far north as Nundydroog.

That this kaolin is fitted for the manufacture of the finer kinds of pottery and porcelain I have been able to ascertain by direct experiment, in consequence of the laborious process, and, to an individual, expensive apparatus required to grind it down to an impalpable powder, by stones of hornstone under water: but from its mineralogical characters I believe there can be little doubt of its being of finer quality than many kinds in England.

My attention was called to the mineral in consequence of being engaged in researches on the fusibility of the rocks and minerals of the Salem district, generally called igneous, in which it was necessary to expose them to a very high degree of heat, in a wind furnace sufficiently powerful to fuse cast steel, and for which I could procure no crucibles at a sufficiently cheap rate, and I have found this kaolin, when mixed with an equal quantity of finely pounded quartz, to fully answer the purpose of affording crucibles and covers, upon which the most intense heat has hardly any effect, the outside being only slightly glazed by the alkali of the fuel, and the crucible being very slightly softened. They are also much superior to those called Hessian, in not cracking, unless by very extreme changes of temperature.

In Calcutta, there are probably many manufactories carried on in the fusion of metals, &c. where this earth would be of great value, and it might even be useful in the manufacture of fire bricks, for lining furnaces, &c., if the carriage by land for 200 miles would not render them too expensive.

At Madras, at the mint for making mufes and crucibles, at the Gun Carriage manufactory, and in several other manufacturing depots, this kaolin might be useful; and a manufacture of the articles might be either established at Bangalore, or the earth itself might be transported.

Coarse Chinaware is an article of import from China, and plates of this ware are purchased in considerable quantities by some of the Natives at 4 annas each, while it is reasonable to suppose that these articles might be manufactured in Mysore at a cheap rate, without the necessity of any very expensive machinery being required.

Proceedings of the Asiatic Society, Wednesday Evening, 5th May, 1841.

THE HONORABLE SIR E. RYAN IN THE CHAIR.

Library Museum.—Calcutta Monthly Journal for March, 1841, No. 76, P.
 The Christian Observer, for May, 1841, New Series, Vol. 2d, No. 17, P.
 Annals and Magazine of Natural History, Dec. 1840, No. 37, P.
 Ochterlony's Mineralogical Report upon a portion of the Districts of Nellore, Cuddapah and Guntoor. Madras, 1841, P.
 Samlede Afghandlinger, of R. K. Rask. Kobenhavn, 1838, Tredie Del. 8vo. 1

At the meeting of the 7th of April last it was resolved to refer to the committee of papers (with reference to the offer of Mr. H. B. Koing, Bookseller at Bonn, to be entrusted with the sale of the Society's Oriental works) to consider the prices of those works and to reduce them to a scale suitable to the means of the scholars and students of Germany. Dr. Hæberlin submitted the following list exhibiting the rates at which he suggested the books should be priced, viz.

Mahábharatá, with contents	Rs. 40
Large paper, ditto ditto	„ 50
Harriwansa	„ 5
Rajah Tarangini	„ 5
Large paper	„ 8
Naishada	„ 6
Fátáwe Aleurgiri	„ 8
Ináyá	„ 8
Kházánat ul Ilim	„ 8
Jawáme ul Riazi	„ 4
Anis ul Musharrafin	„ 5
Sharaya ool Islam	„ 8
Tibetan Grammar	„ 8
Tibetan Dictionary	„ 10
Researches	„ 10

Ordered that the reduced rates be adopted and the list printed in the Journal of the Asiatic Society for guidance, that Mr. Koing's services be accepted and a selection of the Oriental Books be made and forwarded to him by the first favorable opportunity, with suitable instructions, as well as regards the disposal of the books as of the funds which may from

time to time accrue in his hands as sales are effected.

Read the following Report submitted by the Officiating Curator for the month of April last.

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

SIR.—My report on the Museum, for the month of April, is as follows :
Geological, Mineralogical and Palæontological Department.—We continue to arrange and catalogue here at all spare times. Amongst the collections lately arranged are Capt. Hutton's valuable geological series, the fruits of his journey to the Spiti valley, to the expenses of which the Society I think contributed very liberally. The duplicates of this collection have been sent home to the Court of Directors, but we are sadly in want of the catalogue to it; were it only that of the localities. You have I believe addressed Capt. H. on this subject.

We have, at last, obtained the first of our printed catalogues from the press, and as completed copies will be placed in the cases, a part of the Palæontological collections are labelled, and of these also we shall soon have printed catalogues. Our Index, which is wanted at every turn, has not yet appeared.

Osteological Department.—We have here at length been able to place all our small skeletons in two neat glass cases. The large, skeletons have been supported by side bars to the upright supports as suggested by the Hon'ble the President, and all the skeletons have labels. We have added here the skeleton of Mr. Ewbank's Leopard, as reported in my last.

Museum of Economic Geology.—The Catalogue and arrangement of the copper series is completed.

Mammological Department.—*Reptiles, Fishes.*—Nothing new to report.

Ornithological Department.—We have here added nine new specimens, mounted, eight of which are part of Lieut. Tickell's collection, and one Faleo is from Mr. White of Midnapore.

Presentations this month have been the Gud Faleo, stuffed and mounted, from C. P. White, Esq., Midnapore.

I am, Sir, your's, very obediently,

H. PIDDINGTON,

Officiating Curator, Asiatic Society's Museum.

Museum, 30th April, 1841.

With reference to the want of a Catalogue of Captain Hutton's valuable Geological Collections of the Spiti Valley, noticed by Mr. Piddington in his

Report, it was resolved that a communication be made to that Officer for furnishing one.

The Secretary reports the receipt of a letter dated the 20th April last, from Lieut. W. I. E. Boys of the 6th Light Cavalry, offering a large collection of objects of Natural History, 'which in making had occupied almost his sole attention for the last seven years.'

'The Collection,' writes Lieut. Boys, 'has been made and the objects prepared only by myself, and I believe myself warranted in saying that nothing superior has ever been made in that line, as no expense has been spared. It consists of upwards of 350 species of Birds; the whole collected within 50 miles of Mhow Malwa, and of upwards of 200 white glass bottles containing every variety of Snakes, Scorpions, Centipedes and other reptiles, together with the fishes of different parts of India, in spirits, a quantity of Alligators and Gavialis, Boas, &c, several species of the River Turtle and Tortoises, and a superb collection of Insects.'

The whole Lieut. Boys' offers for Rs. 6,000, a sum much below their real value.

It was resolved that before coming to any final decision on Lieut. Boys' offer, that that Officer be requested to furnish a descriptive Catalogue of the collections referred to.

Read a Letter from Lt. A. Cunningham of Engineers, dated 29th April last, advising the dispatch of coins purchased from him by the Secretary for presentation to the Cabinet of the Asiatic Society. Lt. Cunningham adds, 'I have decided upon publishing as complete a work upon our Indian coins as can be made. It will take some months to complete the plates, but I have already done three of them. The 1st Vol. will contain the coins of the Bactro-Grecian, Indo-Grecian, Indo-Parthian, and Indo-Scythian Princes of Bactriana, Ariana and the Punjab. It will contain 20 Plates and about 150 pages of letter press, or perhaps 200 pages, and will I hope be ready by the 1st January next. The title of the work will be 'Coins of Alexander's successors in the East.'

In another letter that Officer also writes:—

'I have just read the only one of all my Kashmeerian coins which had hitherto baffled me. Sri Foramā (na). Now Toramāna was the Zuvarāja (or Cæsar) in A.D. 450, and was imprisoned by his elder brother (the Augustus) for coining money in his own name; and here we have the identical coins that caused Toramāna's imprisonment and also a decided proof of the truth of the Kashmeerian history. I have the coins of 14 Rajahs, and of six Moosulman Kings, making a series of 20 Kings, the most numerous of any Indian sovereignty that has yet been discovered.'

The Secretary informed the meeting of Lt. Cunningham's having declared himself a convert to the identification of the supposed *Mayas*, held by several authorities to have been one of the early Bactrian Monarchs, with Demetrius, a position originally suggested, and maintained at some length, by the Secretary, in No. of the Journal of the Asiatic Society.

Read the following Letters, viz. From the Secretary, Political Department, Government of India, No. 1077, dated the 26th April 1841, transmitting a Report by Mr. Asst. Surg. Walker, on the Geology and Manufactures of the Hunum Koondah district of the Nizam's Dominions, for such notice as the subject may merit.

N.B.—Specimen of produce, as Indigo, &c. &c. from the province in question, have been since received, and will be submitted to the Society at their next meeting, with the Curator's report upon the objects to be submitted.

From Mr. C. P. White of Midnapore, of 19th April 1841, sending a specimen in Ornithology for the Society's Museum.

From Mr. R. Clarke, Hon. Secy. Royal Asiatic Society, London, dated 7th November 1840, acknowledging the receipt of the Journal for November and December 1839, and the Mahabharata, Vol. IV.

Read a letter from Major Thoresby, Jyepore, 5th April 1841, apprizing the dispatch of the stone at the gorge of the Teoree Ghat near Buerath, bearing the Palee Inscription in ancient characters, a copy of which was taken and forwarded to the Asiatic Society by Capt. Burt. Also some specimens of ores of the mines in the Khetree hills.

The Secretary submitted to the meeting, presented by Robert Torrens Esq., the Magistrate of the 24-Pergunnahs, a quantity of coins of the Mussulman Kings of Bengal, found by a Gang of convicts employed on the Roads at Howrah. The coins, as read by the Hon. H. T. Prinsep, Esq., are as follows :

N.B.—O. and R. stand for obverse and reverse of the coins.

No. 1. O. Alwasik bu tued ul Rhuman abooul Moojahid Secunder Shah ibn Ulyas Shah ussooltan.

R. Yumeen ul Khuleefut Illahi Nasir ameer ul moomuneen,
Oun ul islam oo ul moosulimeen; Khuladu Moolkuhoo.
(Circular legend not legible.)

No. 2. O. Ulsooltan ul adil, Ghuma ood dunya oo ood deen, Aboo ul Moozuffur, Ilyas Shah ussooltan.

R. Sekunder oosanee Yumeen ul Khuleefut, Ameer ul Moomuneen.

- No. 3. O. (*broken*) Ussooltan ul adil, Abou Moozufur Secunder Shah, Ibn Ulyas, Shah ussooltan.
R. Yumeen Khuleefut Illahi, Nasir, Ameer ulmoomuneen, Oun il Islam oo ul mooslumeen.
- No. 4. O. Abou ul moojabid Secunder Shah, Ibn Ilyas Shah ul Bengallee.
R. Nasir, Ameer ul moomuneer, Oun ul Islam oo ul mooslumeen.
- No. 5. O. Julal oodunya oo uddeen, abou ulmoozufur Mahomed Shah.
R. Nasir, Ameer ul moomuneen Oun ul islam oo ul moosulmeen
- No. 6. Ditto to No. 5.
- No. 7. Ditto to No. 2.
- No. 8. O. Mahomed Shah. (*Togra*).
R. The Kulma or profession of faith.
- No. 9. (*Ditto*) Mahomed Shah.
- No. 10. O. Syfooddunya oo ooddeen, abou ul moojanid Khoosro Shah, Ibn Azim Shah, Ibn Secunder Shah, Ibn Ulyas Shah, ussooltan.
R. Nasir, &c. &c. &c.
- No. 11. O. Shah ul Azim abou ul Moojahid Secunder Shah, Ibn Ulyas.
R. Ullah Nasir, Ameer ul moomuneen, Oun ul Islam.
- No. 12. O. Julal ooddunya oo ooldeen, Abou ul Moozufur Mahomed Shah ussooltan.
R. Nasir oo Islam oo ul moosulmeen, Khuluda Moolkao !
- No. 13. (*Too much defaced and chiseled to be legible.*)
- No. 14. O. Ulyas oodunya oo oodeen ubou ul moozufur Azim Shah, Ibn Secunder Shah, Ibn Ulyas Shah ussooltan.
R. Nasir, &c. (as before.)
- No. 15. O. Sooltan ul adil Julal oldunya oo ooddeen abou ul mujahid Mahomed shah ! khuladu moolkuhoo !
R. Nasir ameer ul moomuneen, Oun ul Islam oo ulmooslumeen.
- No. 16. (*Togra like No. 8 : nearly illegible.*)
- No. 17. (*Ditto to No. 14.*)
- No. 18. O. Ghyas ooddunya, oo oodeen, ul mulik Azim, Shah oosoltan.
R. Nasir, ameer ul moomuneen, Oun ul islam oo ul moosulmeen.
- No. 19. Ghyas ooddunya oo oolden, abou ul moozufur Azim Shah, Ibn Secunder Shah, ibn shums ooddeen.

- No. 20. (*Ditto to No. 14.*)
- No. 21. O. Ul mowukul bu taced ul Ruhman, Ghums ooddunya, oo ooddeen, Malik Yoozbuk ussooltan.
R. Nasir, &c. &c.
- No. 22. O. Ul mooyud bu deen ul Ruhman Ghums oodunya oo ooddeen, Aboo ul moozufur Mahomed Shah Ulyas.
R. Nasir Ameer, &c. &c.
- No. 23. (*Ditto to No. 14.*)
- No. 24. (*Ditto to No. 14.*)
- No. 25. O. Syfood dunya oo ooddeen, Aboo ul moozufur Khoosroo Shah, Ibn Aeezim Shah, Ibn Secunder Shah, Ulyas shah ulsooltan.
R. Nasir, &c. &c.
- No. 26. (*Ditto to No. 5.*)
- No. 27. O. (*Ditto to No. 2.*)
R. (*defaced by chiseling.*)
- No. 28. O. Ul Mooyud bu taced ul Ruhman.
R. Nasir ooddeen aboo ul moojahid Mahomed Shah ussooltan
- No. 29. O. Aboo ul Moojahid Sekunder Shah, Ibn ulyas Shah, ussooltan.
R. Ulla nasir Khuleefut Ameer ul Moosulmeen oun ool Islam, oo ul Moosulmeen, Khuluda Moolkuhoo.
- No. 30. (*Ditto to No. 5.*)
- No. 31. O. Ula ooddunya oooddeen Aboo ul Moozufur Mahomed Shah.
R. The *Kulma*.

(The *Toghra* of this coin is more legible than usual.)

Of the above numbers 8, 9, 16, 23 and 31 appear to be of Mahomed Shah afterwards King of Hindostan, who reigned A. H. 627 to 634 (A. D. 1229 to 1236.)

Numbers 2, 7, 22 and 27 are of Ulyas or Ilias Shah, who reigned from A. H. 744 to 760 (A. D. 1343 to 1358.)

Numbers 1, 3, 4, 11 and 29 are coins of Secunder Shah son of Ulyas Shah, who reigned from A. H. 760 to 769 (A. D. 1358 to 1367.)

Numbers 14, 17, 18, 19, 20, 23 and 24 are of Azim Shah, son of Secunder Shah, who reigned from A. H. 769 to 775 (A. D. 1367 to 1373.)

Numbers 10 and 25 are of Syfood deen (Khoosroo Shah) son of Azim Shah, who reigned from 775 to 785 (A. D. 1373 to 1383.)

Numbers 5, 6, 12, 15, 26 and 30 are of Mahomed Shah, who reigned from A. H. 794 to 817 (A. D. 1392 to 1409.)

The coin No. 21, bearing the title of Ghyas ood-deen Malik Yoozbuk would appear to belong to the king, who in the list of Pathan Monarchs of Bengal (Prinsep's Useful Tables) is noted as Ikhtiar ood-deen *Malik Yoozbuk*, the only king who bears this remarkable name. The thanks of the Society were offered to Mr. Torrens for his valuable contribution, which will be deposited in the cabinet of numismatology.

Also an old coin forwarded by Capt. Hannington, picked up in the district of Manbhoom; doubts were entertained as to the real nature of the so called coin. It is of pewter; the marks, or characters unintelligible. Further enquiry will be made on the subject, as, if it be indeed a coin, the discovery is singular, and may be ultimately highly valuable.

Read Mr. Secretary Bushby's Letter, No. 888, dated the 14th April 1811, in reply to the communication of the 12th idem, with the officiating Curator's report on the two specimens of rock, of which the following is a copy :

To H. TORRENS, Esq., *Secy. to the Asiatic Society.*

Sir,—In reply to your letter and its enclosure of the 12th instant, I am directed to acquaint you that the Military Board will be requested to instruct the Superintendent of the Agra and Bombay road, to endeavour to procure the specimens and information suggested by the Officiating Curator of the Asiatic Society's Museum.

2d. The Right Honorable the Governor approves of Mr. Piddington's proposition to supply all officers engaged in the Survey and Construction of roads with a copy of Capt. Tremenhoe's Memoir.

I am, Sir, your obedient servant,

G. W. BUSHBY,

Secretary to the Govt. of Bengal.

Fort William, 14th April, 1841.

The officiating Curator submits the following report of 17th April 1841, on the collection of minerals tendered for purchase to the Asiatic Society by Mr. Dodd.

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

SIR,—With reference to the letter of Mr. Secretary Bushby on the subject of the collection of minerals tendered for purchase to the Asiatic Society by Mr. Dodd, I have the honor to report that in consequence of that gentleman's having failed as yet to transmit me his catalogue I have been obliged to make a rough one of the collection which has occasioned delay in furnishing the report.

The collection consists of about 890 specimens in all; of which about 180 may be genera and the remainder species and duplicates. The ac-

known genera of minerals being about 360 in number; Mr. Dodd's collection comprises thus about one half of the whole and generally of the most useful for reference.

With this collection and those in the Society's cabinet, we should be able to form a nearly perfect series, which is in this country a great scientific desideratum, for but few have the time, or the knowledge required to enter upon a chemical examination of a mineral, and comparison with the specimens of a well arranged cabinet will in very many cases obviate the necessity of this. The duplicates also will not be useless if (as suggested I think in one of my previous reports) they be used in the formation of 'Cabinets of Instruction' for the Hindoo, Medical and other Colleges and public establishments, whenever it may be thought proper to furnish them with such.

As far as I am acquainted with the prices of such things at home—though in this respect my knowledge is very limited, I should judge that the price asked is not excessive, and we may possibly obtain it at a cheaper rate.

I have the honor to remain,

Sir, your obedient servant,

H. PIDDINGTON.

Assistant Curator Asiatic Society.

Museum, 17th April, 1841.

Resolved that a copy of Mr. Piddington's report be submitted for the information of Government, in reply to Mr. Bushby's Letter No. 270 of the 24th March 1841.

Read a letter from Captain F. Jenkins, of 1st April 1841, requesting to be supplied with extra Copies of Lt. Tickell's papers on the 'Ho' language for comparison with the numerous languages current within the valley of Gowhatti, and to trace the dialects connected with the Tibetan stock, and the Shan branch. Captain Jenkins writes, 'that the most distinct language in all this Frontier seems to be the Garrow, as its compound and polysyllabic character appears to separate it entirely from the Eastern languages, and yet it does not appear to have the least connection with the Hindu family of languages. The Garrows are isolated from all their neighbours in regard to languages, their country is but a small one; whence they come and how they remain in so small a space, are very interesting questions; and with them as with any others on this Frontier, the languages are likely to be entirely lost before any philologists arise to determine whence they spring. Captain Jenkins concludes his communication with some account of the Rajahs of Cachar.

Read a Letter from D. F. McLeod, Esq. of Jubbulpore, of 31st March 1841, also requesting to be supplied with Lt. Tickell's papers on the 'Ho' language. 'Not,' writes Mr. Macleod, 'from mere curiosity, but because being closely connected with Hill Tribes and greatly interested in them, I would anxiously seize upon any means of instituting a comparison between the language of our Gonds and the Hill people of other parts, and facilitating to myself or others, an insight into the rudiments of their still unknown tongue. And being not without hope of hereafter seeing one day a mission established amongst these people, I should wish much to have by me for distribution one or more copies of a brochure so admirably calculated to elicit a further enquiry.'

'With reference to his (Lt. Tickell's) most admirable paper on Ho-dès, I would mention as it may be of use, that Kôls still abound in Rewah, in our Lohâgpur mahals, and are even found at Jubbulpore and Seoni. Hence I should be disposed to presume that the term 'Kôl' was introduced by the invaders from Ruhitas, which, as far as I can call to mind, not having his paper with me, was not Tickell's impression on the subject.'

With reference to the two foregoing Letters, it was moved by Dr. Hæberlin, that they contained matters worthy of interesting enquiry and that some one of the Members composing the Committee of Papers should be requested to prosecute the enquiry to elicit information on the points alluded to by Capt. Jenkins and Mr. Macleod.

Resolved that Dr. Hæberlin's services be requested in aid of undertaking the task of prosecuting such enquiry in conjunction with Baboo Prosonocoomar Tagore.

Read a Letter from Major Burlton of the 14th April, 1841, with a collection of Bactrian Coins as a loan for the Society's museum. Major Burlton further offered the duplicates of this collection to the Society, for which courtesy as well as for his kindness in allowing the collection to be laid before the meeting, the Secretary was directed to address that officer with the expression of the thanks of the Society. The coins consisted of some silver Menanders (drach.) in excellent preservation, one of the rude silver coins usually believed to be of Enthydemus *struck at a provincial mint*, and the rest copper coins chiefly Azes and Kadphises. The barbarous provincial type of silver coin is ascertained to be of the time of Euthydemus, (authority—Lieutenant Cunningham) and is found in, or at any rate comes from, the Bokhara country.

Read a Letter and enclosure from Dr. H. H. Spry of the 5th May, 1841, of which the following is a copy.

MY DEAR TORRENS,—I have been honored by Dr. Wm. Edwards, whose celebrity as the author of more than one important Physiological work must be well known to you, with a communication relative to the establishment of a '*Société Ethnologique*' at Paris, of which I feel proud in having an opportunity of submitting an outline to the notice of the Asiatic Society of Bengal.

My distinguished friend desires to call my attention to a subject which he says he has close at his heart. He has reminded me of the fact, that he has established at Paris an Ethnological Society. It is composed of distinguished and able members, and is going on remarkably well. He then goes on to say, that his wish is to have some of the most eminent scientific men at Calcutta named as members of the Society. He desires that the names may be limited to four or five.

Directions for travellers have been drawn up and published comprising every point in Ethnology. A few copies have been forwarded and I now do myself the pleasure of placing a couple at the disposal of the Society.

Dr. Edwards alludes to three things that he is solicitous about. The possession of drawings, principally outlines, with very little shade, of the best characterized heads of the Indian races; men and women. If by any possibility casts could be taken, another great benefit would be conferred, and lastly, skulls, which Dr. Edwards hopes may without great difficulty be collected. If cases die in hospital, and opportunities occur for possessing the skull, he wishes much that a drawing of the Indian front, of the natural size, should be made in order to arrive at an accurate knowledge of the relation which existed between the skull and the features.

Dr. Edwards asks as a favor if he could be put in possession of any drawings of Indian races;—for them, he says, the Ethnological Society of Paris would feel deeply grateful.

I send you these outlines, with the hope, that by giving publicity to the objects and intentions of the Ethnological Society at Paris, through so scientific a body as the Asiatic Society, assistance may be rendered the physiologists of Paris in the pursuit in which they are engaged.

You will see the particulars more in detail in the two accompanying brochures of general Instructions, which perhaps you will oblige me by laying before the Meeting of the Society to-night.

*Société Ethnologique.***INSTRUCTION GÉNÉRALE ADRESSÉE AUX VOYAGEURS, ETC.****§ I.****DES CARACTÈRES PHYSIQUES.**

Le point le plus important de l'éthnologie, c'est la connaissance du *type* : on ne saurait en avoir une idée suffisante sans le dessin.

1^o Il faut donc dessiner les portraits de ceux que l'on veut faire connaître ; et avoir soin, pour en donner une idée complète, de représenter la tête de deux manières : de face et de profil.

2^o Il convient aussi de faire une esquisse de tout le corps, et d'en bien étudier les proportions, pour savoir si elles ne présentent pas quelques particularités. Il faut surtout faire attention à la longueur du buste relativement aux membres supérieurs et inférieurs ; au creux des reins et à la saillie de la partie sous-jacente, comme dans le Nègre, le Hottentot, etc.

3^o Il serait bon de prendre la mesure de la hauteur du corps, et d'évaluer sa force au dynamomètre d'une manière approximative, si l'on n'a pas cet instrument.

Il est extrêmement important d'avoir le portrait de l'homme et de la femme, car leurs types tendent à différer d'autant plus qu'on s'élève d'avantage dans l'échelle des races.

4^o Toutes les fois qu'on pourra se procurer les crânes des naturels du pays, on n'en laissera pas échapper l'occasion, et on cherchera de même à obtenir des naturels qu'ils se laissent mouler leur buste.

Il y a toujours chez une nation plusieurs races ; il faut donc chercher à distinguer les types purs du produit des mélanges.

§ II.**DE LA LINGUISTIQUE.**

Le point le plus important après, les caractères physiques, c'est la langue. Il est évident que si l'idiôme est cultivé, il y aura des grammaires et des dictionnaires, qu'il sera indispensable de se procurer, s'ils sont rares en Europe. Si ces ouvrages n'existent pas, il faudra y suppléer en formant deux vocabulaires ; l'un bref, l'autre plus étendu, selon le temps dont on pourra disposer. L'un contiendra les noms des objets sensibles, des idées abstraites mais usuelles ; l'autre les différentes parties du discours.

En second lieu, il conviendrait de faire une ébauche de grammaire ; de

s'occuper d'abord du verbe, en prenant les trois temps fondamentaux, le présent, le passé et le futur, avec les modifications des personnes et du nombre ; puis du substantif, avec les variations du cas et du nombre ; de faire connaître l'accord de l'adjectif avec le substantif ; les pronoms, les propositions avec un ou plusieurs régimes, et les adverbes joints à un verbe. Si l'on pouvait indiquer les rapports de la langue avec d'autres idiômes qui lui sont affiliés, ce serait un renseignement fort utile. Quel est le mode de numération en usage ?

§ III.

DE LA VIE INDIVIDUELLE ET DE FAMILLE.

Pour donner une idée des mœurs relatives à l'individu et à la famille, il convient de prendre l'homme à sa naissance et de le suivre jusqu'à la mort, en faisant connaître les actes solennels qui s'y rapportent. Ainsi, quant à la naissance, il y a peu de nations qui n'en marquent l'époque par quelque cérémonie ; il faudrait la faire connaître ; indiquer le lieu où l'on dépose l'enfant ; décrire la manière de le porter, de le vêtir, de le nourrir, de lui apprendre à marcher et à parler. Si l'on exerçait quelque compression sur la tête ou quelque autre partie du corps, il serait bon d'en faire mention,

Quand l'enfant sait marcher ou parler, quelle est son éducation domestique ; car il n'y a pas de peuple qui n'apprenne aux enfans ce qu'ils doivent savoir dans la suite.

Lorsque l'individu de l'un ou de l'autre sexe est arrivé à la puberté, y a-t-il quelque cérémonie qui le constate, et quelles sont ses occupations jusqu'à ce qu'il se marie ? Informez-vous avec soin de ce qui vous avec soin de ce qui concerne le choix d'une femme ; à quelles conditions on l'accorde, et décrivez les cérémonies du mariage. Si dans cette union il y a pluralité de femmes ou d'hommes, comment vivent-ils entre eux ? Quelles sont leurs intrigues pour favoriser leurs fils ou leurs filles, et quelle en est la conséquence pour le sort de ces derniers ? Quelle est l'autorité du père ou de la mère ? Quel est le degré de respect filial des enfans et quels sont en général les sentimens de famille ?

Faites connaître le régime alimentaire des différens membres de la société, suivant leur sexe et leur âge en indiquant : 1^o les alimens ; 2^o la manière de les préparer ; 3^o les personnes qui les apprennent.

Quels sont les vêtemens du peuple, suivant la fortune, le rang, le sexe et l'âge de chaque individu ?

Etudiez les maladies auxquelles les deux sexes sont sujets aux diverses époques de la vie ; et les différences qui ont lieu à cet égard entre les natu-

rels du pays et les étrangers ; les rapports de ces maladies avec le climat et la manière de vivre ; les soins que les parens, les amis et les médecins donnent aux malades.

Quel est le genre d'occupation de l'homme et de la femme ? Quel est leur âge moyen, et le terme extrême auquel ils arrivent ?

Quelles sont les cérémonies qui accompagnent ou qui suivent la mort, telles l'enterrement, le deuil, ect.

Ces cérémonies diffèrent-elles pour le mari et la femme ? Quel est le sort du survivant et des enfans ?

§ IV.

DE LA VIE SOCIALE

Comme les arts ne se développent guère que par des causes sociales, nous devons les examiner ici.

1^o *Habitations, édifices, voies publiques, etc.*

Le moyen le plus sûr et le plus court de donner une idée exacte d'une habitation, c'est d'en faire le dessin ; en marquant par écrit les matériaux dont on sert. Il en est de même de tout édifice, ainsi que des meubles ou des ornemens.

Il convient de faire connaître les différentes manières d'orienter les maisons et les édifices, de les grouper pour former les villages, les bourgs, les villes, ainsi que la manière de les fortifier et de les distribuer dans le pays. Dites si les rues sont pavées ou non et comment on fait les chemins.

Faites connaître tous les autres genres de constructions, tels que les vaisseaux et les bateaux, les ports et les chantiers, les arsenaux, etc. Donnez une idée convenable des canaux, des jardins publics, ect.

2^o *Agriculture.*

Enumérez les plantes qui servent à l'alimentation, telles que les légumes, les grains et fruits ; puis à la médecine, à l'habillement, à la teinture et aux autres arts. Décrivez la manière de les cultiver, en faisant une attention particulière aux amendemens (ou substances minérales qu'on ajoute au sol), aux engrais (ou substances organiques qu'on y mêle) aux moyens de travailler la terre avec les instrumens aratoires, aux procédés d'irrigation. Dessinez les diverses races d'animaux domestiques, donnez leurs caractères distinctifs et l'usage qu'on en fait.

3^o *Tissage, fabrication de vêtemens, etc.*

Faites connaître la manière de préparer les différens tissus écus ou les pelleteries servant à l'ère de fore, habillement et aux autres usages domestiques.

4° Teinture.

Donnez une idée suffisante de la manière de préparer les couleurs et de les appliquer.

5° Art de travailler le bois et les métaux.

Marquez le degré auquel les naturels sont arrivés dans ces arts. Indiquez les autres métiers exercés dans le pays.

6° Professions. Arts libéraux.

Distinguez les diverses classes de marchands et de négocians, les hommes de loi et les médecins, ainsi que leur genre d'études et leur manière d'espérer leur profession.

Y a-t-il des peintres, des sculpteurs, des architectes, des ingénieurs, des poètes, des orateurs et des savans ?

Notez le point auquel sont parvenus les arts et les sciences. Rapportez, autant que possible, quelques productions qui puissent nous donner une idée de la manière dont ils sont cultivés.

7° Education publique.

Il serait très utile d'énumérer les diverses espèces d'écoles publiques, le nombre de ceux qui les fréquentent comparé à celui de la population en âge de les suivre ; décrire le genre de leurs études, et de faire connaître les facilités ou les obstacles que rencontrent les élèves lorsqu'ils arrivent à l'exercice de leur profession.

8° Etablissements de bienfaisance.

Décrivez tous les établissemens de ce genre : hôpitaux, hospices, maisons de prêts, institutions pour les aveugles, sourds-muets, etc.

Indiquez les bibliques et le genre d'ouvrages qui publiquess'y trouvent, tels que manuscrits, livres, gravures, cartes, etc.

9° Droit public et privé.

Un objet d'une haute importance serait d'étudier la constitution de l'état, la hiérarchie des pouvoirs, les droits respectifs des gouvernans et des gouvernés ; de faire ressortir les divers rangs de la société ; et de nous apprendre s'il y a des propriétés communes ou particulières, leur degré de sécurité, et leur mode de transmission par héritage, par vente, par donation, etc.

Comment règle-t-on les discussions qui s'élèvent à leur égard ?

Punit-on les attentats contre les personnes et contre les propriétés ?

Quels sont les crimes et les délits dont on s'occupe, les tribunaux qui en prennent connaissance, et dans quelle proportion se trouvent les criminels et les délinquans par rapport à la population.

Comment asseoit-on et lève-t-on les contributions ? Quel est le rapport entre l'impôt et la perception ?

10° Relations sociales.

Les rapports de la société méritent une attention particulière. Il serait bon de connaître les relations qui subsistent entre les naturels du pays et de constater s'il y a de la douceur ou de la dureté, de la probité ou de la mauvaise foi, de la sécurité ou du danger dans les liaisons.

Les sociétés des hommes et des femmes sont-elles séparées ou mêlées ?

Les sociétés des hommes et des femmes sont-elles séparées ou mêlées ?

De quelle manière reçoit-on les visites ; et qu'offre-t-on en pareil cas ?

Donne-t-on souvent des repas ; et qui les compose ?

Quels sont les amusemens publics, les différentes espèces de chasse et de pêche ? Comment les naturels voyagent-ils dans leurs pays, et se déplacent-ils souvent ?

Il sera bon de constater la facilité ou la difficulté que l'on rencontre à gagner sa vie, le nombre ou la proportion des indigènes ; la population respective des deux sexes, etc. ; le rapport de la mortalité aux naissances. S'il n'y a pas de documens statistiques directs, il faudrait donner les meilleures preuves de l'augmentation, de la diminution ou de l'état stationnaire de la population ; le nombre des mariés, des célibataires, des enfans légitimes et naturels, etc.

§ V.

DES RAPPORTS DES NATURELS AVEC LES PEUPLES ETRANGERS.

1° Institutions militaires.

Dessinez les armes, si elles ont quelque chose de particulier.

Faites connaître la manière dont on lève les armées ; et dites si elles sont permanentes ou non.

Quels en sont les grades, les exercices, la discipline ?

Quelles sont en général les causes de guerre ?

Faites savoir s'il y a quelque cérémonie par laquelle on la déclare, ou si on la fait à l'improviste ?

Quel est le genre de stratégie et de tactique suivi ?

Quels sont les rapports entre la cavalerie et l'infanterie, ou enfin entre les différentes armes ? Il faudrait dire encore s'il y a un droit des gens relatif à la guerre et au maintien de la paix ; comment on règle les alliances offensives et défensives ; comment on traite les ennemis pris à la guerre ; si on les massacre, ou s'ils sont prisonniers ou esclaves ; et dans ces deux cas, quel est leur sort pendant qu'on les conduit au marché et quelle est leur destinée dans la suite.

2^o Commerce.

Donnez un tableau aussi complet que possible des denrées que le pays fournit aux indigènes et aux peuples étrangers, et de celles qu'il en reçoit. Faites connaître les moyens de transport et les échanges soit en monnaie, soit en nature. Quels sont les établissemens qui peuvent faciliter le commerce, tels que bourse, banque, etc. Dites le nombre d'étrangers qui pénétrent dans le pays, et la manière dont ils y sont traités et comment ils en peuvent sortir ?

Quels sont les pays étrangers que les naturels visitent et les moyens de communication ?

§ VI.**DE LA RELIGION.**

Quelle est l'idée que les habitants du pays se forment de Dieu et des êtres qu'ils regardent comme supérieurs à l'humanité ?

Dites ce qu'ils pensent d'une vie future, de la distribution des peines et des récompenses.

Cherchez à connaître les autres dogmes religieux.

Quelles sont les formes du culte, les différentes pratiques et cérémonies religieuses ?

Jusqu'à quel point le peuple croit-il aux dogmes ; et comment pratique-t-il les devoirs prescrits ?

Entrez dans quelques détails sur la hiérarchie, les droits et l'influence du clergé ou de ceux qui représentent les prêtres ; et faites connaître l'action morale de la religion sur le peuple.

Décrivez les superstitions et la manière dont elles agissent sur les sociétés.

§ VII.**DES RAPPORTS DU PEUPLE AVEC LES CONDITIONS EXTERIEURES.****1^o Sol.**

La terre est-elle plane ou montueuse ? Quelles sont les rivières, les lacs, les marais, les marécages ; et quelle est la nature géologique du terrain ? L'eau est-elle contenue dans le lit des fleuves, ou déborde-t-elle ? Y a-t-il de l'eau et des terres salées ? Dans quelle étendue se trouve la partie boisée ?

Indiquez-nous le degré de fertilité de la terre ; et dans quelle proportion se trouvent les parties productives avec les parties stériles. Donnez une indication des objets utiles, nuisibles ou curieux qui peuvent exister dans les règnes organique ou inorganique.

2° Climat.

Faites connaître :

1°	{	1° La température, 2° La pression barométrique 3° La quantité de pluie,	}	moyenne et extrême	{	1° du jour.
						2° du mois.
						3° du trimestre.
						4° de l'année.

2° Les jours	{	de pluie d'orage	}	par	{	mois.
						trimestre.
						année.

3° L'intensité de lumière solaire comparée à la lumière diffuse (à l'ombre) ; succession et variation des saisons.

§ VIII.

DES TRADITIONS HISTORIQUES, REVOLUTIONS POLITIQUES ET ANTIQUITES.

Il faudra rechercher d'abord quels sont chez un peuple les souvenirs qu'il a conservés de son origine et de ses affinités avec d'autres peuples ; quelles sont les révolutions qu'il a éprouvées dans sa langue ou dans ses mœurs, dans les arts et dans les sciences, dans sa richesse, sa puissance ou son gouvernement, par des causes internes ou des invasions étrangères.

Quelles sont les sources où l'on peut puiser les instructions demandées ?

Sont-ce des documens historiques ou des monumens de l'arts ? Dans le premier cas, ces documens sont-ils consignés dans des poèmes ou dans des ouvrages purement historiques ? Il serait fort heureux de pouvoir en donner une idée.

Dans le second cas, il sera nécessaire de donner un dessin et une description pour les parties qui l'exigent, des édifices monnaies dont on peut tirer quelque fruit pour la solution des questions proposées.

Cherchez dans les traditions mythologiques tout ce qui se rapporte à l'histoire du pays.

Quelles sont les opinions des naturels sur la cosmogonie ; quel est leur système de chronologie ; et jusqu'à quelle époque remonte-t-elle ?

N.B.—The Secretary begs to recommend the above 'Instructions' to the attention of members of the Society, whose position throws them into communications with any of the tribes and races in Central India, or on the frontiers whose distinctive characteristics are so strongly pronounced, as is generally the case with those semi-barbarous people. The consideration of these septa with reference to the several attributes as noted by Dr. Edwards, would form a highly interesting and useful study. The Secretary has been fortunate enough to recover among some papers, recently sent to the Society's rooms, an essay on the principles of Ethnology by Dr. Woods, a corresponding member of the Parisian Ethnological

Society. This is placed at the disposal of the Editor of the Journal of the Asiatic Society, for early publication.

With reference to the request of Dr. Edwards of Paris, 'for Heads of the Indian races' to serve as aid to his studies in Ethnology, the Secretary suggested a collection of Grant's 'Heads,' should be forwarded, but Dr. Spry had already anticipated him, and it was resolved to refer the Letter to Professor O'Shaughnessy to ascertain if 'Casts' were not available from the native modeller in his employ.

The Secretary informed the meeting that a 'Circular,' by desire of the Governor General, has been issued by Dr. Pearson, for contributions of subjects of Natural History for enriching the Barrackpore Menagerie, the Zoological Society and the East India Company's Museum.

The Secretary noticed that a Sanscrit work was laid by Baboo Sooruj Narain Roy before the Society. It was resolved that it be referred to Dr. Hæberlin for examination, and report of the merits of the publication in question.

For the presentations and contributions, the thanks of the Society were accorded.

NOTE.→I received too late for No. 110 the following Addenda to the paper on Arracan, by Dr. SPRY, which was published in my last.

“ Since I sent you this I have heard from Captain Lumsden that his labours in sinking two shafts for Coal (Arracan) were arrested at the depth of 19 and 16 feet respectively, by the influx of water ; and that there was reason to believe that at the time the operations were stopped the stratum had very nearly been pierced. It also appears that I was mistaken in believing that adequate funds are not placed at the disposal of the authorities for prosecuting Coal discovery.”

JOURNAL

OF THE

ASIATIC SOCIETY.

Of the early History of Sindh, from the "Chuch Namuh" and other authorities. By LIEUT. POSTANS, Assist. Pol. Agent, Shikarpore.

[My able correspondent, Lieut. Postans, has been for some time perseveringly employed in tracing out whatever material is available in *Sindh*, for the purpose of throwing light upon its early history. A book called the "*Chuch Namuh*," is the principal authority to which he has had recourse in preparing the historical sketch, which he has enabled me to have the satisfaction of publishing. Both he and Capt. Hart (2d Grenadiers, Bombay army) who has been turning his attention to similar pursuits, despair of discovering any more authentic work bearing upon the early history of *Sindh*, and agree in describing the modern *Sindhees* as so illiterate and apathetic, as neither to have the will, nor the power to further their researches. I still, however, do not despair of the recovery of other authorities, as the country becomes better known to us.

In the mean time, Lieut. Postans has ably and successfully availed himself of all the material at his disposal, which, dating from the Mussulman inroads, may be fairly considered as authentic. The short notice of the history of *Sindh* before that period, to be found in the works of Mussulman authors, must be necessarily in many respects of a traditional character, and we indeed find, that the *Chuch Namuh* does not attempt to do more than describe the revolution which destroyed the ancient Sindian dynasty in the century immediately preceding the Islamite invasion. The use of the modern Persian name *Bruhmanabad*, as applied to a city in the days of *Chuch*, gives sufficient proof of the loose manner in which the Mussulman historian collected his material; he was perhaps, in the spirit of a genuine Moslem, careless of all respecting the infidel inhabitants of the land, which was not in some way immediately connected with the advent of his own people.

We are not the less bound to acknowledge our obligations to Lieut. Postans, for having undertaken the task of laying, compendiously, before an English reader, the first historical notice of *Sindh*, which has I believe appeared unconnected with the history of other lands and peoples.]



CHAPTER I.

Sindh—its situation—climate—name whence derived—early history—capital *Alor*—extent of territory—rule of the *Rahees*—appearance of the first Brahmin *Chuch*—his reign and death—his son *Dahir*—account of his rule until the Mahomedan invasion.

Sindh is one of the sixty-one climates of the world ; it is situated in the five first climates, belonging chiefly to the second, and is in the same region as the holy cities of *Mecca* and *Medina*. The river of *Sindh* rises in the mountains

Sindh, its situation according to Eastern Geography.

of *Cashmeer* ; another joins it from the mountains of *Cabool* in *Mooltan* ; it is met by the river *Sehoon*, and thus proceeds to the sea. Its water is clear, bright, and cool during the hot season ; in the language of the country, it is called *Mehran*. All the rivers of *Sindh* flow towards the south, where they empty themselves into the sea, (such as the waters of *Peelab*, *Chenab*, *Lahore*, *Sultanpoor*, and *Bajuwarrak*.) The climate

Climate. of *Sindh* is delightful ; its mornings and evenings cool, the country to the north hot, whilst that to the south is cold. Its inhabitants intelligent, and of large stature. *Sindh* is so called from

Name whence derived. *Sindh*, the brother of *Hind*, the son of *Noah*, whose descendants from one generation to another ruled in

that country ; from them also sprang numerous tribes, such as the *Nubeteh*, the men of *Tak*, and the tribe of *Moomeed*, who governed Early History. and possessed it by turns ; no record remains of these, and its history commences with the last of the dynasty of the *Rahees*, or *Rajahs*, whose capital city and seat of government was *Alor*.

Capital *Alor*. *Alor* is described as a large, flourishing, and populous city, situated on the banks of the river *Mehran*, possessing large edifices ; its gardens highly cultivated, producing every kind of tree and fruit, where travellers had all their wants supplied.

This territory extended to the east as far as *Cashmeer* and *Kunooj* ; Extent of Territory. west to *Mukran* and the sea ; south to the territories of the ports of *Surat* and *Deo* ; and to the north to

Kandahar, Seestan, and the mountains of Soolleemany, Girwān, and Rynakan. The first *Rahee* mentioned, is *Rahee Dewahey*; he was a

powerful prince, possessing absolute authority over the
 Rule of the Rahees. territory of *Sindh*, as above-mentioned, and formed al-

liances with many of the rulers in *Hind*; at his death, he was succeeded by his son *Rahee Siheersin*; he by his son *Rahee Sahursee*; and he by his son *Rahee Siheersin* the 2nd. During this reign, the king of Persia, *Ueem Roz*, sent a force by the road of *Kirman* to *Mukran* and *Reech*, which countries they laid waste, and *Rahee Siheersin*, in trying to repel this invasion, was defeated, and he himself killed by an arrow through the neck; his troops fled to *Alor*, and his son *Rahee Sahee* was seated upon the throne. During the *Rahee Sahee's* reign, the Brahmin *Chuch*, (who afterwards possessed

the country, and bequeathed it to his son,) made his
 The Brahmin Chuch. appearance. It is related, that *Rahee Sahee's* minis-

ter *Ram Rao*, was a man of such capability, and so well directed the affairs of state, that the *Rahee* himself seldom interfered with them, but passed the greatest part of his time in the sensual enjoyments of his harem. Accident brought *Ram Rao* and the Brahmin *Chuch* together; the latter is described as having been a very talented and eloquent man, well versed in all the learning of the Hindoos. *Ram Rao* appreciating his abilities made him his deputy, and on one occasion sent him on some affairs, which required the *Rahee's* attention, to the door of the harem: the sanctity of *Chuch's* priestly office admitted of his being allowed to enter the private apartments without the formality of a curtain between him and its inmates, and so great was his personal beauty, that the *Ranee* became enamoured of him at first sight; she afterwards made *Chuch* acquainted with her passion, but he declined her overtures, on the score of his being a Brahmin, and as such, incapable of treachery to the *Rahee*, whose confidence he had gained. But an opportunity soon presented itself to the *Ranee* for the accomplishment of her designs. The talents of *Chuch* had given him almost universal sway over the affairs of government, and the minister *Ram Rao* was no longer thought of; in the mean time the *Rahee* became dangerously ill, and the *Ranee* formed a plot, by which, in the event of the *Rahee's* death, *Chuch* should succeed to the throne of *Sindh*. She caused a proclama-

tion to be issued in the name of the *Rahee*, for a general assembly of all ranks and classes, and placed the throne in the public hall of audience. When the people were assembled, they were informed that the *Rahee's* health prevented his then being present, or any longer attending to the affairs of his country, but that he had given his signet, and delegated absolute authority to the Brahmin *Chuch*, whom they were to obey as his deputy. *Chuch* was thus vested with power, and his ability secured him the obedience of the subjects; the *Rahee* afterwards died, leaving no children; *Chuch* married the *Ranee*, and by universal consent was placed upon the throne. The government of five preceding *Rahees* occupied 137 years. *Chuch* was the first Brahmin who ruled. Many of the relations of the deceased *Rahee*, who Reign of *Chuch*, until his death. possessed claims to the government of the country, were inveigled by the *Ranee* into the palace, and murdered. *Chuch* opened the doors of his treasury, and by his bounty secured the good offices of the soldiers, and of his subjects generally. He had scarcely however imagined himself secure on the throne, when *Rana Miharut Chittooree*, heading the remainder of the relations of *Rahee Sahee*, came with an army from Joudpoor and Chittoor to assert their claims to the throne. The *Ranee* urged *Chuch* to prepare to defend his possessions; he again propitiated the troops by large presents in money, and prepared to meet *Rana Miharut*. The forces drew up for battle, in the vicinity of *Alor*, but *Rana Miharut* advancing in front of his host, challenged *Chuch* to single combat, as the most merciful way of settling a dispute, in which the two chiefs only were immediately concerned. The result of the combat was decided to be final as to all claims of territory; and whoever fell, his country was to pass to the possession of the victor. *Chuch* consented to this; the two chiefs advanced in front of their armies; *Chuch* directing his servant to bring his horse slowly after him, mounted quickly, and treacherously slew *Rana Miharut* with one blow of his sword. The troops of the latter witnessing the fall of their leader, fled in dismay; *Chuch* pursued and killed many of the fugitives; he then returned with great pomp to *Alor*, the houses and bazars of which city were ornamented upon the occasion. His authority was now established, and he became a powerful king. After a reign of 40 years he died, leaving two sons; the eldest *Dahir*, and the younger *Dihir*; he had also one daughter. His eldest

son *Dahir* succeeded to the throne, and his brother *Dihir* was appointed governor of *Burhamanabad*. He made a tour of his dominions, and after a treaty of peace with the governor of *Kirman*, returned to *Alor*. When he had for some time occupied himself in adjusting and arranging the affairs of his country, he consulted the astrologers as to his future fate, and that of his dominions ; they told him that neither in his own, nor in his brother's horoscopes could they discover any evil sign, but that in his sister's it was written, that whomsoever she married, should possess the country of *Sindh* ; this sorely perplexed *Dahir*, who finding the thought of his losing power and empire too intolerable to bear, determined to confound the fates, and avert the evil threatened, by marrying his own sister ; his subjects and those about him tried in vain to dissuade him from so unnatural a proceeding, but his superstition was insurmountable, and with all the forms of his religion he married her.*

When his brother *Dihir* heard this, he was sorely incensed, and wrote a letter full of bitter reproaches to *Dahir*, for the disgrace which he had brought upon his family, adjuring him to make all the reparation in his power, by breaking off so unholy an alliance.

Dahir's infatuation would not admit of this, and he excused himself by assuring his brother, that beyond the mere ceremonies of marriage he had committed no sin.† *Dihir* determined to punish his brother, and with this intent collected a large force at *Burhamanabad*, with which he marched upon *Alor*, and encamped under the walls of the city ; through the intervention of the mother, peace was concluded between the brothers, and *Dihir* died shortly afterwards of small pox, in the city of *Alor*. *Dahir* proceeded to *Burhamanabad*, and having appointed another deputy to govern it returned to *Alor*, where he busied himself in completing the fortifications, which his father *Chuck* had begun. His

* Capt. Hart in a letter to me quoted, in No. 108 (p. 1216 of vol. ix. Asiatic Society's Jour.) mentions the remains of an ancient city in *Upper Sindh*, called by the country people "Dumb-i-Dilora-Shah," traditionally said to have been destroyed on account of the king having married his sister. He referred me then to the "*Chuck Namah*." The tradition refers doubtless to the "*Alor*," of the history, making it however the name of the king instead of the city, and to the story of *Dahir*. 

† It is but just to add, that in all the manuscripts from which this sketch is compiled, *Dahir* is particularly represented as not having added the crime of incest to his other follies.

dominions were prosperous, and his sovereignty firmly established ; he made a tour to the East as far as *Cashmeer*, upon the boundaries of which country he planted two trees as memorials of his journey. The flourishing state of the country, and the growing power of *Dahir*, excited the envy of the *Rajahs* of *Hind*, and they instigated and supported *Runmul*, governor of *Kunooj*, in collecting a large force to descend upon *Sindh*. *Runmul* marched to the neighbourhood of *Alor* ; *Dahir* called in the assistance of Arab mercenaries, and sought advice as to the best method of repelling the invasion, from *Mahamed Ullafee*, who directed him to dig a ditch in front of his army, one furlong in length, and to cover it over with grass, &c. *Mahomed Ullafee* at the head of about 5000 men, Arabs and Sindians, made a night attack upon the enemy's camp, then feigning a retreat, led them to the ditch, into which they fell, and were for the greatest part slaughtered ; he took many prisoners, (80,000 men and 50 elephants.) After this victory the power of *Dahir* was more than ever firmly established ; he ruled with pride and prosperity for twenty-five years, when his kingdom began to decline.

CHAPTER II.

Reason of sending the army of the Faithful to *Sindh*—*Buzeel* killed—*Bin Cassim* appointed to command the army—arrives at *Deebul*—takes that place as well as *Nierunkote*—the governor of *Moostan* surrenders—*Hijaj Bin Sookufie* urges *Bin Cassim* to attack *Alor*—the tribe of *Chunch* proffers their allegiance—the fort of *Rawur* taken.

The king of Ceylon, *Serundeepe*, sent some servants to the *Khalif* of Bagdad, (*Abdool Mulk*,) with presents of female slaves, and other merchandize ; the boat which conveyed them, was driven into the port of *Deebul*, (now called *Tattah* and *Lahuny*,) where they were attacked and robbed by a predatory tribe, (the *Nukamrehs*,) some were killed, the rest imprisoned. When the news of this outrage reached *Hijaj Bin Yusuf Sookufie*, minister of *Abdool Mulk*, he instigated that prince to send an army to *Sindh*, to retaliate upon the infidels, and to release the faithful ; at the same time he wrote a letter to the *Rajah Dahir*, for some explanation of the circumstances. *Dahir* disclaimed any participation in the affair,

or any authority over the robbers who had committed it. *Hijaj* gained the *Khalif's* permission to send an officer named *Buzeel* to *Mukran*, where he was instructed to levy troops, and attack *Sindh*. *Dahir*

Buzeel killed. sent his son *Jaiseh*, who defeated *Buzeel's* forces, killed him, and took many prisoners. In the mean time the *Khalif*

H. 92 A. D. 710. died, and was succeeded by his son *Wulleed*, (*Bin Abdoul Mulk*); *Hijaj* urged him to renew the war, and to send a force under *Mahomed Bin Cassim*, (a cousin of *Hijaj*), to release the faithful, and punish the unbelievers, as his father, the former *Khalif*, had *Bin Cassim* appointed to command the army. intended to have done. The *Khalif Wulleed* gave

the necessary orders to *Hijaj* for the preparation and equipment of a force from the public treasury. In one month he collected an army of 15,000 men, 6,000 of whom were horse, 6000 mounted on camels, and 3,000 foot, with 30,000 dinars for expenses; five catapultas for levelling forts were dispatched in boats. *Bin Cassim*

Arrives at *Deebul*. marched, and arrived at the fort of *Deebul*, to conquer *Sindh*, in the year 92 H. (A. D. 710.) *Jaiseh*, the son of *Dahir*, was at that time governor of the fort of *Nierunkote*,* and sent intelligence of the arrival of the Mahomedan army to his father at *Alor*; *Dahir* asked advice of the *Ullafees*, (a tribe which he had sheltered after an outrage which they had committed on some of the deputies of *Hijaj*); they counselled him to avoid meeting the powerful army of *Bin Cas-*

Takes Deebul. sim, and to entrench himself in the fort of *Alor*. *Bin Cassim* took the fort of *Deebul*, in which was a large Hindoo temple, so sacred,† that it was supposed to act as a talisman, and to prevent the capture of the fort. *Bin Cassim* threw it down with a catapulta, destroyed the temples of the idolaters, building *musjeeds* on their sites, released the prisoners of the Faithful who were confined there, and putting his material on board boats, proceeded to *Nierunkote*. After a difficult journey of seven days, the roads being blockaded by the *Sindians*, and the troops of *Bin Cassim's* army suffering much from drought, owing to the river not swelling,‡ the army of the Faithful arrived before the fort of *Nierunkote*, the governor of which was *Sumnee*, who had succeeded the son of *Dahir* (*Jaiseh*), in consequence of the

* Near the modern city of *Hyderabad*, see Capt. *McMurdo's* paper on *Sindh*.

† Hence its name from the Hindoo, for a temple, *Deebul* or *Deewul*.

‡ The Mahomedan army joined in prayer for relief from this calamity; their supplications were answered by a plentiful fall of rain and a swell of the river.

latter being sent to the more important command of *Burhamanabad*. The Mahomedans began to suffer much from want of supplies, but

after a short siege, the governor *Sumnee* surrendered the keys of the fort on condition of quarter

Takes Neirunkote. to the garrison. *Bin Cassim* entered the fort, destroyed the temples, built *musjeeds* and *minarets* in their stead, and appointed keepers and *mouzzins* to the same; he left magistrates to preserve his authority at *Neirunkote*, and taking the governor *Sumnee* with him, proceeded onwards. This last wrote to the governor of the fort of *Moostan*, *Bucherim Chunder*, advising him to submit to the invaders, as they were too powerful to oppose. *Bucherim's* fidelity however was unshaken, but after a week's siege, he was obliged to abandon the

Takes Moostan. fort, and flee to *Seem*, of which place *Boodeh* was

governor. *Bin Cassim* took possession of the fort of *Moostan*, and having made arrangements for its government, proceeded to *Seem*, where he found *Bucherim Chunder* and *Boodeh* prepared to oppose him. The infidels failed in a night attack upon the camp of the Faithful; and *Kakeh*, *Boodeh's* father, foreseeing that the time was arrived when the country of *Sindh* must submit to the Mahomedan arms, came to *Bin Cassim* to intreat for quarter for his son, and the whole garrison of *Seem*—it was granted. *Bin Cassim* took possession of *Seem*, and leaving *Abdool Mulk* to settle the affairs of that place, pursued his march, daily adding fresh conquests to the arms of the Faithful; he took the forts of *Buhultoor*, *Kundabuh*, (? *Gundava*,) and *Mussaloh*, from all of which he exacted tribute, leaving troops to retain the new possessions thus acquired. At this time a

Hijaj urges *Bin Cassim* to attack *Alor.* letter reached *Bin Cassim* from *Hijaj*, ordering him to *Neirunkote*, to cross the river, and prepare to

expel the *Rajah Dahir* from the capital of the country *Alor*. The large and powerful tribe of *Chuch* proffered obedience to *Bin Cassim*; it is also related that they embraced *Islamism*, and were the first inhabitants of *Sindh* who did so. In obedience to the instructions of *Hijaj*, *Bin Cassim* proceeded to the fort of *Rawur*, which he summoned to surrender; the governor *Moheh Bin Bussayeh* made a feint to resist, being afraid of the wrath of *Dahir*, but ultimately surrendered the fort, and with the garrison promised obedience to *Bin Cassim*.

CHAPTER III.

Dahir alarmed at the successes which attend *Bin Cassim*, exerts himself to prevent his crossing the *Meheran*—the Mahomedans suffer from famine—*Dahir* offers terms—not accepted—*Hijaj* sends horses and supplies to *Bin Cassim*, who passes the river—*Dahir's* consternation—comes out from *Alor* with a large army—account of his death, and the defeat of his forces—the Mahomedans enter the capital *Alor*.

The successes which attended the army of *Bin Cassim*, began to terrify the *Rajah Dahir* for the safety of his capital and dominions, and he foresaw that if the Mahomedans effected the passage of the river, the fate of his sovereignty was sealed. He collected an army of the *Koordans*, and arriving at the opposite bank, employed himself in obstructing the passage of *Bin Cassim*; this duty he afterwards delegated to *Jah Humeen*, and he himself returned to *Alor*. *Jah Humeen* performed his part so well, aided by the *Rajah's* son, *Jaisch*, (who cut off the supplies of the Mahomedans,) that these latter began to suffer all the misery and horrors of a famine; they were driven to slay their own horses for food; coupled with this, *Chund Ram Haleh*, the former governor of *Secoostan*, heading some insurgents, seized that fort from a small party of horse, who were left to govern its garrison. *Bin Cassim*, however, immediately dispatched *Muzhub Bin Abdul* with 1000 horse and 2000 infantry, who regained the fort, and took *Chund Ram* prisoner. *Dahir* thinking these misfortunes would soon dispirit the Moslems, wrote to *Bin Cassim*, assuring him, that if he wished to withdraw his forces, he might do so in security; the latter answered, that he had no intention of retiring, until he had taken the capital *Alor*, and subjected *Sindh* and its dependencies to the Mahomedan rule. The intelligence of the difficulties encountered by *Bin Cassim*, and the loss of the passes, reaching *Hijaj*, he dispatched 1,000 others, with fresh supplies to *Bin Cassim*, urging him to lose no time in crossing the river, as the overthrow of *Dahir* was the first and most important step; on receiving this, *Bin Cassim* proceeded to *Juhum*, where with

the assistance of *Mokeh Bin Bussayeh*, he collected some boats, and filling them with sand and stones, commenced a bridge for the passage of his army; it was under many difficulties and obstructions at length

Bin Cassim crosses the river, notwithstanding *Dahir's* opposition.

completed; the first detachment of the Faithful passed the river under a shower of arrows from the infidels, who were collected in strength on the opposite bank; but these being driven back, the whole of the army of *Bin Cassim* passed without further molestation. It is reported that *Dahir's* consternation. rage on receiving the intelligence was so great, that he killed the messenger who was the bearer of it.

Bin Cassim now exhorted his soldiers to firmness: "the river was in their rear, and the enemy in front, still if any were faint-hearted amongst them, then was the time to quit the army, and return to their own country." There were only three of the whole host who did so. *Bin Cassim* having thus secured the co-operation of his troops, proceeded onwards to *Jeyoor*, near which place he first caught a glimpse of *Dahir's* forces; he detached *Muhuzzin Bin Sabit Kiese* with 2,000 men, and *Mahomed Zyad ul Huddee* with 1,000, to oppose them. In the mean time, *Dahir* called *Mahomed Haris Ullafee* to him, and said: "I have protected and promoted you; now is the time to requite my kindness, and to shew yourself worthy of my confidence." *Mahomed Haris* excused himself by saying, that he could not oppose the Moslems without being a renegade to the faith he professed. *Dahir* therefore deputed his son *Jaisch* to lead his army against *Bin Cassim*; he did so, but was defeated with great slaughter, and *Bin Cassim* advanced upon *Alor*, which he besieged.

On the 10th of the month *Ramzan*, in the year ninety-three *Hejira*, *Dahir* comes out from *Rajah Dahir* determined to make one bold stroke *Alor* with a large army. for his crown and kingdom; came out from the city of *Alor* with an immense army; they say he had 30,000 infantry in advance of his cavalry and elephants; he himself seated on an elephant, the *howdah* of which was richly ornamented, passed to the right and left, animating the soldiers, and disposing his battalions in order of battle; seated in the same *howdah* were two beautiful female slaves, one administered wine, the other *pān* and beetle-nut to him. The battle which ensued is described as

terrific, lasting from morn till night. *Bin Cassim* himself fought as a common soldier with his troops, performing deeds of valour; but the day was decided in favour of the faithful. In consequence of the latter throwing fireworks amongst the Rajah's elephants the *howdahs* took fire, and the infuriated beasts rushed madly through their own troops, trampling down all before them until they arrived at the river, into the muddy banks of which they plunged. *Dahir's* elephant was amongst them, and the Mahomedans profiting by the confusion, threw

Dahir's death and
the defeat of his
army.

showers of arrows, one of which struck *Dahir* in the neck, and killed him; his elephant sunk into the mud; and the Brahmins who were behind the *howdah*,

took the body of the Rajah and buried it there. The infidels fled in all directions, and the carnage which ensued was dreadful; all the approaches to the citadel of *Alor* were most carefully blocked up, and the Brahmins and two female slaves fell into the hands of an officer of *Bin Cassim's* army, named *Keiss*, to whom they detailed the particulars of *Dahir's* death, and begged for quarter. *Keiss* took them to *Bin Cassim*; the body of *Dahir* was found in the mud of the river, and the head was severed from the body, and stuck upon a spear. That night the Moslems occupied themselves in prayers and thanksgivings for the victory they had gained. The next morning *Bin Cassim* caused the head of *Dahir*, together with the two slaves, to be placed over one of the gates of the city. *Dahir's* wife, *Ladee*, seeing this, threw herself from the walls, and the garrison being no longer able to offer any opposition, opened the gates of the fort. The army of the

Mahomedans enter
Alor 93 H. (A.D. 711.)

faithful entered and took possession of *Alor* on Friday, the 11th of Ramzan, in the 93rd year of the *Hejira*. *Dahir* ruled 33 years, and the rule of the Brahmins embraces a period of 92 years.

CHAPTER IV.

The tribe of *Soommah* and others pay homage to *Bin Cassim*—the rebellion of the sons of *Dahir*—governors appointed to the principal cities and provinces of *Sindh*—*Bin Cassim* extends his conquest as far east as *Cashmeer*—the story of his death—deputies of the Kings of *Ghuznein*, *Ghoor*, and *Delhi*, govern in some of the provinces of *Sindh*—origin and rule of the tribe of *Soomrah*—*Nasir-ud-deen Kibajeh*—his rule and death.

The whole of the rich booty of *Alor*, including the treasury and crown jewels of *Dahir*, were collected and placed in charge of *Keiss*, to convey to the *Khalif* at *Sham*. The *Khalif* honoured and promoted *Keiss*, and wrote letters of approbation to *Bin Cassim* urging him at the same time to extend his conquest still further, until the whole of the countries which were dependencies of *Sindh*, should be subjugated and form part of the *Khalif's* territories.

After the defeat and death of *Dahir*, the men of *Soommah* came with music and dancing to pay homage to *Bin Cassim*; he asked the reason of this, and they told him that it was their custom thus to greet a victorious chief. The *Lohanas*, *Battis*, men of *Suhateh*, *Koosejeh*, *Huleh*, &c. led on by *Ally Mahomed Bin Abdool Ruhmun Sulleetee*, with head and feet bare, also proffered their allegiance. *Rebellion of the sons of Dahir.*

In the meantime the sons of *Dahir* entrenched themselves in the fort of *Sikunder*, where they determined to offer opposition to *Bin Cassim*. *Burhamanabad* having previously been taken, and its tax and tribute settled, *Bin Cassim* marched to besiege the fort of *Sikunder*, and to quell the rebellion of the sons of *Dahir*, (*Jaisch*, *Toofic*, and *Wukeeah*); he reduced this place, and although the sons of *Dahir* were sometime before they would believe the death of their father, (even abusing their mother, who was sent to assure them of it, by calling her a *hár*, traitress, and one in league with the "slayers of cows,") a sorceress assured them that he was dead, whereupon they surrendered.

The capital city *Alor*, with all the principal provinces and cities of the country of *Sindh* having thus fallen to the Mahomedan arms, governors were appointed to the following places:

Uhnuf Bin Keiss to *Alor*, with *Moossie Bin Yakoob* as Cazy; to *Burhamanabad*, *Widah Bin Ameen*; and to

Rawur, Tobeh Dārus. *Bin Cassim* then proceeded towards *Mooltan*, and on the road, at the fort of *Baheeah*, *Kulsur Bin Chunder* made obedience to him ; after that, the fort of *Sukkeh* was taken, and *Utbeh Bin Tumhee* left there as governor. *Mooltan*, with all its strongholds and dependencies fell to *Bin Cassim*, who appointed *Khuzzaneh Bin Abdool Mulk* to the fort of *Mehpoor*, *Dawood Bin Nusserpoor* to *Mooltan*, and proceeded to *Debalpoor* ; at this time he is reported to have had 50,000 horse and foot under his banners, independent of the regular army with which he invaded the country. Having taken possession

Bin Cassim conquers as far as the country of *Cashmeer*. sion of the countries to the east as far as *Cashmeer* and *Kunnooj*, he returned, having placed trustworthy governors and servants in all those places. At the time

that *Keiss* was deputed to convey the treasure and booty captured at *Alor*, Story of his death. with the prisoners to the *Khalif* of *Sham*, amongst the

latter were two daughters of *Dahir*.* The *Khalif* consigned them to his *harem* until they should recover from the fatigues of travel, and be prepared for his service ; their beauty was very great, and the *Khalif* was about to consign one to his bed, when she informed him that *Bin Cassim*, flushed with victory, had robbed them both of their virginity, and had kept them in his *harem* for three days ; the *Khalif's* wrath at this knew no bounds, and he wrote an order with his own hand, informing his servants to seize *Bin Cassim*, to sow him up in a raw cow's hide, and send him to *Bagdad*. This order reached the chief at *Hadapoor*, and he desired the servants to obey the order of their tyrannical master ; they did so, and in three days the brave *Bin Cassim* sunk under the torture. His body was conveyed to the *Khalif*, who exultingly shewed it to the two women, as a proof of his absolute power ; and of the full measure of revenge which he had taken upon the innocent *Bin Cassim*. They confessed that the accusation was totally false ; that they were solely actuated by revenge for the murder of their father, and the destruction of his kingdom. The wretched *Khalif* too late saw the injustice he had committed, and suffered the most poignant remorse ; he caused the two women to be tied to horses, and dragged to death through the streets of *Bagdad*. *Bin Cassim* was buried at *Damascus*. At the time of *Bin Cassim's* death, *Bin Keiss*

* Gispul Deo and Soeing Deo.

was governor of *Alor*, the other places being governed, as before-men-
 tioned; five other governors, deputies of the *Khalif*
Khalifs of Beni Oomhae. of *Beni Oomhae*, governed *Sindh* successively, with
 little or no alteration in the state of affairs, until in the year 133 H.
 the power over that country passed to the *Khalifs* of the dynasty of *Beni*
Abbas. The period of the rule of the deputies of the *Khalifs* of *Beni Oomhae*
 in *Sindh*, embraces a period of 40 years from its conquest in 93 to 133
 H. (A. D. 750.)

Sindh continued to be a dependency of the *Khalifs* of the tribe of
Beni Abbas, who sent many deputies to govern the country. The
 only circumstance noted as worthy of observation throughout their
 rule, is, that one of the governors named *Tumun*, who arrived from
Bagdad, brought with him many Arabs, residents of *Samrah*, who
 remained in *Sindh*, and in the course of time, produced the powerful
 tribe called the *Soomrahs*. In the year H. 416 (A. D. 1025,) *Sooltan*
Mahmood Ghuzney sent deputies to the country of *Sindh*, thus
 terminating the sovereignty of the tribe of *Beni Abbas*, after a period
 of 283 years. The men of *Soomrah* had for a period of nearly 100
 years been powerful *zumindars*; but as they continued to pay tax and
 tribute, they will be hereafter treated of as rulers.

The deputies of the kings of *Ghuzneiny*, *Ghoor*, and *Delhi*, possessed
 many of the provinces of *Sindh*, and sent governors
 to them from the time of *Sooltan Mahmood Ghuznei-*
ny, until a man named *Soomrah*, of that tribe, during
 the reign of *Sooltan Abool Rusheed Ghuznein*, was by the *Soomrahs*
 placed upon the throne, about 446 H. (1054 A. D.) and ruled indepen-
 dently. According to some writers, this tribe were originally Arabs, from
 a place called *Samrah*; they became *zumindars* in *Sindh*, of some power,
 and after the departure of the tribe of *Beni Abbas*, their numbers in-
 creased; whilst the deputies of the kings of *Guzneiny*, *Ghoor*, and *Dekli*
 possessed portions of the country, the *Soomrahs* ruled independently.

According to the author of the *Muntukhib-ul-Twareek*, *Sooltan*
Abool Rusheed being of weak intellect, neglected
 his dominions, and the men of *Sindh* threw off his
 allegiance; and in the year 445 H. (1053 A. D.) placed a man
 of the tribe of *Soomrah*, named *Soomrah*, on the throne. He mar-
 ried the daughter of *Sad*, a *zumindar*, by whom he had *Bahoon-*

kur, who succeeded his father, and died in the year 461 H. (A. D. 1068;) he left a son, *Deodah*, who ruled for 24 years, and died in the year 485 H. (1092 A. D.) After him *Sunkahar* reigned 15 years; *Huneef* 36 years; *Onmur* 46; *Deodah* II. 14 years; *Pustoo* 33; *Kezreh* 16; *Mahomeed Toor* 15; *Kuhereh* (unknown,) *Deodah* III. 14; *Tahee* 24; *Juneesur* 18; *Bahoonkur* II. 15; *Huffeef* 18; *Deodah* IV. 25; *Oomur Soomrah* 35; *Bahoonkur* III. 10; *Humeel* succeeded him; and being a tyrant and oppressor, was the cause of the downfall of the *Soomrah* dynasty. But according to others, this tribe was in *Sindh* altogether 550 years, as *zumindars* and rulers, and their overthrow by the men of *Soomah* was occasioned by the tyrannies of the governor

Humeel, in the year of the *Hejira* 752 (A. D. 1351,) when their dynasty ceased.* Previous to this death.

period, *Nasir-ud-deen Kubajeh* who was deputed at the time of *Shums-ud-deen Ooltumsh* of *Delhi*, governor of *Sindh*, about the year 610 H. (A. D. 1213,) declared himself independent. A force under *Jhingiz Khan* invaded the country. *Nasir-ud-deen* not being prepared to oppose them, entrenched himself in the fort of *Mooltan*, where he was besieged for forty days; but the besiegers were obliged to return unsuccessful. Many of the great men of *Khorassan*, *Ghoor*, and *Ghuznein* fleeing from the oppression of *Jinghiz Khan*, came to *Nasir-ud-deen* at *Mooltan*.

In the year 611 H. (1214 A. D.) *Mulck Khan Khuljee* made an incursion upon *Seestan*. *Nasir-ud-deen* marched to oppose him; the army of *Mulck Khuljee* was defeated, and he himself killed.

In the year 622 H. (1225 A. D.) *Shums-ud-deen* took an army to *Oochch*, to overthrow *Nasir-ud-deen*, who had entrenched himself at *Bukkur*; to this place *Shums-ud-deen* detached *Nizam-ul-Moolk*; but

His death. *Nasir-ud-deen* in attempting to escape from *Bukkur*, took boat, which foundering in a storm, he was drowned.

* The rule of the tribe of *Soomrah* in *Sindh* is far from being clearly made; but in the manuscripts consulted in this sketch, the authors confess their want of authentic record, and *Meer Massoom*, after a very unsatisfactory account, closes it by saying: "If any of my friends know more on this subject, let them publish it; I have said all I can upon the matter." Nor is the author of the *Soofut-ul-Kiram* more explicit; (vide his contradictory statements); but it is generally received, that from the date of sending *Nasir-ud-deen* to *Sindh*, until the rule of the *Soomas*, (about 200 years,) *Sindh* was annexed to *Delhi*.

(To be Continued.)

Geological Report on the Valley of the Spiti, and of the Route from Kotghur. By Capt. HUTTON, 37th N. I.

[The paper now published, completes a series of notes of a journey to the Spiti Valley, undertaken on account of the Asiatic Society, by Capt. Hutton, 37th Regt. N. I. It was with those which have already appeared placed at the disposal of the Editor of this Journal by the Committee of Papers. The results of the author's geological observations have induced the adoption of theories, upon which the Editor is only competent to remark in so far as the identification of the opinions of a publisher is concerned with those of any writer, to whom he is enabled to offer a medium of communicating his views to the public.

In the belief that hardly any novel theory could be broached, which would be unproductive of good results, (if not by its intrinsic merits, at any rate by the consequence of the discussion it might excite,) the Editor has great pleasure in giving publicity to this paper, for the views contained in which the author is alone answerable.]



The valley of the Sutledge is that portion of the western Himalya which, as its name implies, forms the tract of country through which the river Sutledge flows.

The term *valley* is however scarcely applicable to it, since it is strictly speaking nothing more than a deep and rugged mountain glen, of more than ordinary sternness and magnificence, often affording from the abrupt rise of its rocky sides, a mere channel for the roaring torrent which winds its irresistible and headlong course along its sheltered bed.

On either side rise high and snow-clad peaks, forming along the river's course two mighty walls, whose dark and furrowed sides proclaim the constant warfare which is waged by frost and heat alternately.

Villages are numerous along the river's course, sometimes placed near the water's level, at others raised high above it on the mountain's side, surrounded by their cultivation cut in steppes, and sheltered by the stern and frowning cliffs which raise their hoary summit far above it.

In the lower part of the valley, commencing from Rampore downwards, to below Kotghur, vast beds of rolled and water-worn stones are seen accumulated on the river's banks, and rising high above the water's present level. Such deposits evidently owe their origin to the eddies or back waters of some far mightier stream than that exhibited by the Sutledge in the present day, even at its greatest height, and must undoubtedly have been formed by the rush of water attendant on the outburst of some enormous lake or *lakes* in the higher portions of the hills.

These deposits extend in many places along both banks of the river, and appear to have been formerly one solid mass of debris, which as the waters gradually disappeared, have become divided by the current of the stream.

These are for the most part situated at those places where the Sutledge takes a rapid turn, and have been evidently thrown up *within* the elbow by the eddies, or back waters.

On the surface of these broad and flat alluvial deposits, now flourishes an abundant cultivation, consisting of barley, wheat, rice, tobacco, poppies, &c. which being situated high above the river's level, are irrigated by the minor streams, which are furnished from the heights above them.

Higher up the river's course the valley narrows, and forming in many parts a mural cliff on either bank, gives a mere passage to the foaming stream, which rushes with a hoarse and deafening roar over the boulders which obstruct its progress, and dash its waters in muddy waves on high. Some hundred feet above the stream the hills are clothed with dense and stately woods of oaks and various sorts of pines, among which the "Ree," producing the edible seed called by the people "Neoza," is in great abundance. Above the belt of wood, are seen to rise huge rocky spires, along the rugged line of mountains, bare of all vegetation, and crowned by everlasting snows. From these snow-clad heights are furnished numerous streams, which rushing downwards in a sheet of foam, furrow the mountains sides with minor glens, and join the Sutledge as it rolls along below. Now and then the forests cease, and wide grassy tracts succeed, affording pasture to multitudes of goats and sheep; while here and there the whole hill side has slipped away, and left a mural height of precipitous and crumbling rocks, which are annually precipitated into the depths below by the expansive powers of the frost and snow.

The general features presented by the Geology of these hills, may be briefly and summarily comprised in the following observations :—

The main or central range of the Himalya or true snowy mountains, runs in a general direction from East-South-East to West-North-West, sending off branches or spurs in every direction, intersected or divided everywhere by deep and precipitous valleys, whose narrow bed or bottom almost invariably serves as the channel of some mountain torrent or rivulet, whose waters are supplied from the snowy heights above. Where the sides of these valleys are of sufficient elevation to retain the snow throughout the year, these rivulets receive a neverfailing supply of water; but, on the other hand, if the enclosing walls are of moderate or medium elevation, the vallies are often dry for several months together.

The vallies, it must be borne in mind, are not to be attributed, as some have contended, to the gradual wear and tear of the weather, and the streams which now drain through them, but have been formed by the convulsive uprise and disruption of the lofty mountains which form their sides; the glen or valley being thus a mere ravine or trough lying between them, and furnishing often just room sufficient for the passage of an insignificant stream.

The existence of the valley is not therefore to be attributed to the ablations caused by the constant action of the waters; but, on the other hand, the presence of the rivers and streams within them is entirely owing to the configuration of the mountains, which furnishing on the heights vast beds of snow, are ever sending down supplies, which naturally gather in the hollow troughs below, and gradually wind their way to form a junction with some larger stream, which in its turn seeks out the noble rivers of the plains.

It would therefore appear, that the existence of these hill streams is altogether owing to the previous formation of the vallies by the uprise of mountain ridges, the intervention of a glen or *khud* being the natural consequence of disruption in a range, or the sudden alteration of direction of the upheaving power, thus often causing ranges to intersect or to run parallel with each other. Thus the vallies are in no wise the consequence of the unceasing action of the streams, which now find a fitting channel in their depths.

In the present day, these glens usually communicate or open into some other, and the waters gradually escape, but doubtless time has been when their enclosing barriers were continuous, and numerous lakes were formed, until the weight of waters accumulated from the melting of the snows, burst through the rocky walls and so escaped. This is indeed a fact and no wild theory, for the people of different parts of the hills still hold traditions of such events. Dr. Gerard, I think it is, who mentions, that the natives informed him the valley of the Buspa was once closed at the lower extremity, and contained a lake, traces of which may still be seen along the banks of the present stream. A similar lake once occupied the glen in which the town of Soongnum now stands, and thick alluvial deposits containing rounded pebbles may still be seen in some of the higher parts of it; from the lower portion they have been swept away by the out-rush of the waters.

Of this, however, I shall speak again hereafter. The dip of the strata is, as might be expected in such a vast and often confused assemblage of mountains, excessively variable; and although previous travellers have uniformly insisted much on a N.E. dip, it will be quite as often found

to lie in an opposite direction. The prevailing inclination of the strata may therefore be said to be N. E. or S. W. It is, however, remarkable that the latter dip, although perceptible on both sides of the snowy range, is more prevalent on the northern than on the southern side. It has also been pointed out as matter of astonishment, that while one aspect of the mountains presents a gradual and shelving face, rich in soils and forest scenery, the opposite exposure is, on the contrary, found to present a bare and often mural cliff. This, however, is no just cause for astonishment, as the circumstance where it occurs is simply owing to the outcrop of the strata being on the precipitous side, while the dip of the other forms a more shelving slope. But this circumstance is by no means confined to any one direction in particular, for the outcrop of strata is no more prevalent on the northern than on the southern or any other exposure. It may, however, be taken as a general feature in all mountains, that while the dip or inclined position of the strata gives on the one face a shelving surface for the growth of plants, the other face or outcrop must necessarily be rugged and nearly barren, as furnishing by its precipitousness no resting place for soils. In this respect the Himalya does not differ from other mountain ranges. Travellers, however, having no knowledge of geology, and witnessing these facts, have sought to solve the problem by bringing to their aid supposed peculiarities of soil, of aspect, or of climate.

Viewed at a distance from the plains of India, these hills appear to form one long continuous chain or ridge, entirely clothed with everlasting snows, and this line has been designated by way of pre-eminence or distinction, by the name of the "snowy range," or "region of perpetual snows." Arrived within the mountains, and perched aloft upon the summit of some portion of this mighty range, the traveller is surprised to find that what he had been led to consider one continuous field of snow, is nothing more than a vast assemblage of scattered and far distant peaks, approximated apparently by the distance at which they were wont to be viewed into one wide-extending line, and forming component parts of the same snow-clad range.

He is surprised to find the greater portion of that line to be absolutely devoid of snow during several months of the year, except within the deep and sheltered glens, to which the rays of the summer sun can only penetrate for a few short hours during each day, and where frost resumes its sway the moment his beams are withdrawn or intercepted by some towering peak.

Far beyond the ridge which he has hitherto been accustomed to distinguish as the snowy range, he now beholds gigantic and frowning masses clothed in the winter garment, rising often in isolated peaks to

an elevation exceeding that of the main or central chain on which he stands.

Around him, far and wide, he beholds these rugged and awe-inspiring peaks rising pre-eminently grand amidst the sea of mountains by which he is surrounded, and he now first learns that the line of snow he has witnessed from the plains, is the wintery sheet which envelopes these often widely separated masses, but which to the eye of the far-off observer, have become blended by the distance into one long line of continuous snowy peaks.

The central range, and all the hills, with the exception of these loftiest peaks and some deep secluded glens, usually lose the sheet of snows during the period that the monsoon is raging in the plains. It is at this season that the snows send down the greatest supplies of water to the rivers, commencing about the end of May and continuing till September, when the frosts again arrest the dissolving snows, and the mountains once more put on the pure and dazzling robes of winter, and continue thus enveloped in one sheet of snows until the approach of summer again relieves them.

No sooner has the wintery garment disappeared, than a fine rich sward at once springs up, almost as if by magic, so rapid is the vegetation in these high tracts,—affording abundant pasture to the flocks and herds, which then range over them to the height of 15,000 feet above the sea.

This smiling and verdant state of things is, however, unhappily of short duration, appearing like the transient gleam of sunshine that often precedes the fiercest storm, yielding in the space of two short months to the drifting whirlwind and wreaths of snow, that soon enshroud the whole in cold and dreary solitude.

Journeying from Kotguruh, in the lower hills, towards the Spiti valley, the geological formations which came under my observation from that station to the frontiers of Tartary, were exclusively of the primary class.

Commencing at Kotguruh, and crossing the brow of the hill above Kaypoo, we find strata of *mica* and *hornblende schists*, jutting up through the surface, interspersed with veins and nodules of *quartz*.

These veins are often found to contain iron disseminated in small thin scales resembling *mica*, and in such cases the *quartz* is generally in a state of decomposition. This ore pays no duty to Government, and the mines, if indeed such they can be called, are seldom worked, being so unproductive, that out of 14 lbs. weight of the rough ore only 2 lbs. of iron, and that impure, can be procured.

Veins and masses of coarse primitive *calc spar* or *carbonate of lime* are also seen to accompany the *mica slate*. These rocks continue, with an



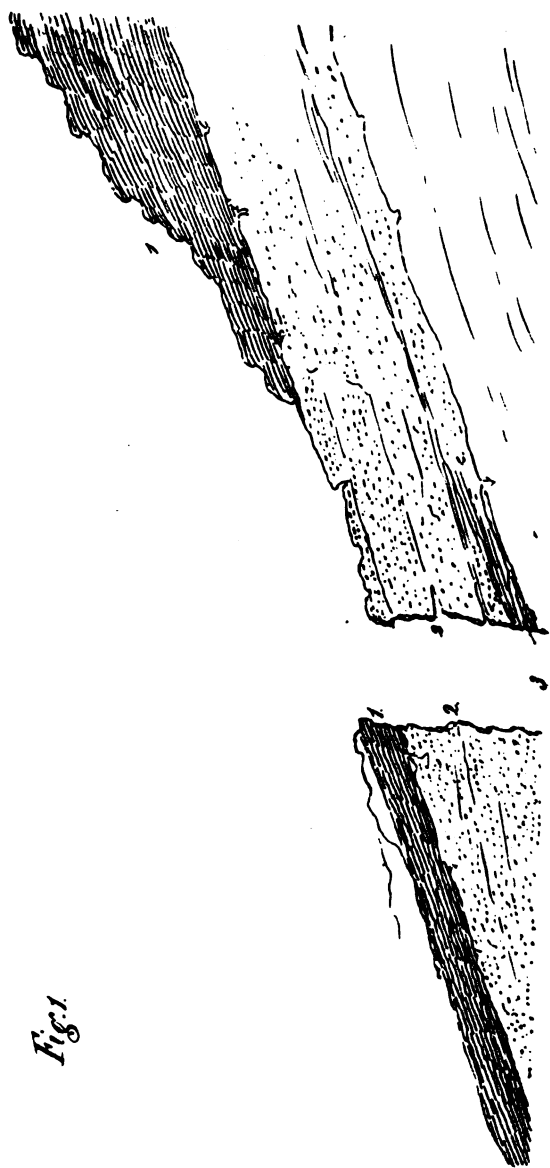


Fig. 1

occasional bed of *porphyritic gneiss*, until we reach Rampore, half a mile beyond which a fine white *granular quartz* occurs, underlying *mica slate*.

These strata dip strongly to the N. E., and are seen on either side of the river, by which they appear to have been transversely divided, the lower end dipping down on the right bank, while the upper portion forms a high mountain on the left.

I say these strata have been *apparently* divided by the Sutledge, which now flows through them, because such *in reality* has not been the case; but the bed of the river lying through them, is entirely attributable to the disruption of the strata at this point having formed a fitting channel for the waters to escape through to the plains.

(See plate)—FIG. 1.

1. 1. *Mica Slate*. 2. 2. *Granular Quartz*. 3. *Bed of Sutledge*.

The surface of this *quartz rock* takes a yellowish rusty hue when exposed to the weather, but when freshly fractured, it is of a pure white, somewhat resembling Carrara marble in appearance, but of a coarser texture.

Onwards from Rampore, the *mica schist* is seen in several varieties, sometimes appearing to be composed entirely of *mica*, at others containing a predominance of *quartz*; in these cases the strata are either soft and crumbling, from the *mica* scaling off, or very hard and flinty, from the quantity of *quartz*.

Silvery mica passing into *chlorite schist* is abundant near Goura, and from its soapy and decomposing nature, the whole rock has in many places slipped away altogether, leaving a constantly decomposing cliff, from which in wet weather large masses are constantly falling.

Further on, the *mica* is seen to contain numerous small crystals of *hornblende*, which cause it to pass gradually into *hornblende schists*. *Garnets* of small size occur occasionally imbedded in the *mica*, which also contains masses of *white quartz*, in which beautiful crystals of *cyanite* are interspersed, varying in shade from pale sea green to bright blue.

The characteristic rocks, however, from Kotgurh to Sarahun are *mica* and *hornblende slates*, frequently alternating with each other, and imbedding blocks of *porphyritic gneiss* and *white quartz*.

From Sarahun the *gneiss* begins to shew itself as the prevailing rock, and occurs both common, red, and *porphyritic*;—*mica slate* and *hornblende* are also frequent, and when they come in contact, the *mica* often becomes jet black.

A few miles from Sarahun, on the right bank of the river, an interesting appearance presents itself in the disposition of the strata. The dip which up to this point has been pretty uniformly to the N. E., now gradually rises, and preserving for a short distance a nearly horizontal position, at last lifts itself abruptly, and dips back again to the S. W. at the same angle of about 45° .

From this disposition of the strata it becomes evident, that they have been lifted or upheaved at both ends, from the horizontal position they once had, by some volcanic force. The lowest strata exposed to view at this spot are on the right bank of the river, nearly even with the water, and form a complete arch immediately under those strata which dip to the N. E. I annex a slight sketch made on the spot, which will serve to show the position of the rocks, better than a description. (*See plate*)—FIG. 2.

Beyond this, as we approach Traada, a fine white *granite* is observed, containing large scales or crystals of *mica*, and farther on still, about Nachar, *white felspar* becomes abundant, imbedding the same *mica* crystals, and forming the first division of the *granite* of some geological writers. *Quartz* also occasionally entered into its composition and formed true *granite*, with which were found *hornblende* and *mica slates*, *porphyritic* and *granitic gneiss*. In some instances where the *hornblende* and *granite* were in contact, the *mica* of the latter rock assumed a black and glossy appearance, producing a variety of *granite* of some beauty.

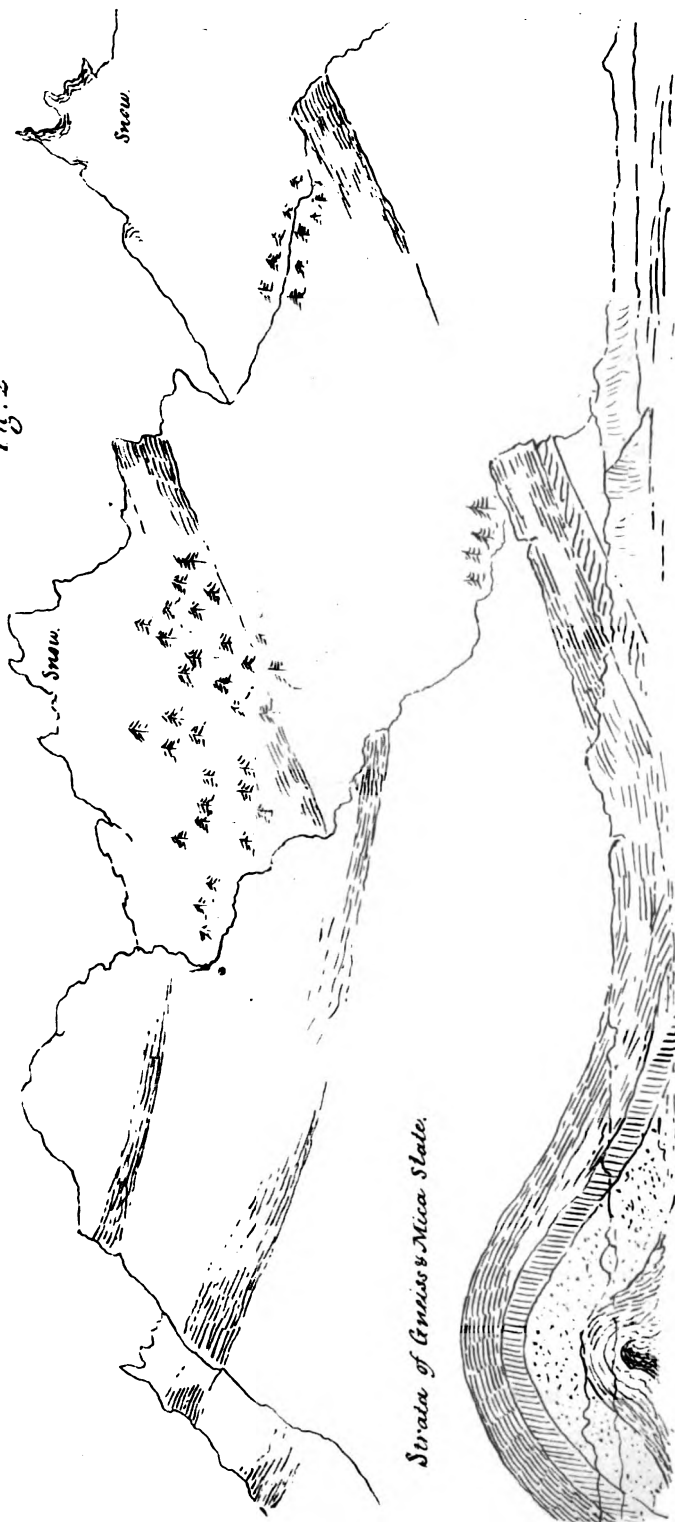
Proceeding from Nachar, the road passes over formations similar to those already mentioned, and a few miles lead down to the Sutledge, which is crossed by a good broad *Sangho*. At this point the rocks rise abruptly in huge masses on either side, confining the river to narrower limits, and affording a mere passage for its waters.

These rocks are of *gneiss*, and the stratification which previously had often been indistinctly discernible, now ceased altogether, and the beds presented a shattered and amorphous mass,—a circumstance by no means of rare occurrence among this class of rocks.

From the *sangho* to Chergong the road still continues along the bank of the river over beds of boulders and broken rocks of every size, consisting of *granite*, *gneiss*, *mica*, and *hornblende slates*. Here too *cyanite* again occurred in *quartz*, and crystals of *crysoberyl* (?) in *granite*.

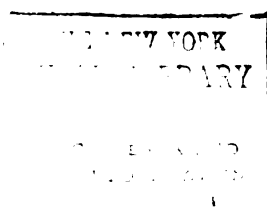
From Chergong to Meeroo the strata of *gneiss* are often laid bare by the descent of streams from the snows above, and the dip is seen falling to the N. E. at about the usual angle of 45° . Beyond this place occur thick beds of *mica slate*, containing *garnets* in profusion, and often, from the decomposition of the rock, the whole road is strewn with *garnets* of various sizes. Beneath this bed occurs one of *white quartz rock*, which is seen rising from the edge of the Sutledge to about 3,000 feet in thickness.

Fig. 2



Strata of Gneiss & Mica Slate.

Suttedow



Near Chini, the *mica slate* contains occasional small crystals of *cyanite*, and sometimes passes into *chlorite slate*.

A short distance from Chini, the whole hill side has slipped down into the Sutledge, from the action of frost and snow, and the cliff now towers up from the banks of the river, presenting a sheer and perpendicular wall of between six and seven thousand feet in height. This vast mass is composed throughout of *gneiss*, and the road, which is a mere scaffolding, passes along the face of it, at 4,000 feet above the Sutledge, which is seen foaming below.

From this to the village of Leepee, the formation is pretty nearly the same, consisting of *granite*, *gneiss*, *hornblende*, *mica*, and *quartz*.

The *granite* about Punggee, Rarung, and Junggee, contains a large proportion of *hornblende*, and at Rarung it is also seen to assume a brick red colour, often traversed with veins of *quartz*, both red, amber, and white. The red *granite* appears only in masses imbedded in a yellowish variety, which is the true rock, and which towards Leepee gives place to *gneiss* and *mica slate*. Above the last mentioned rock commences the first bed of *argillaceous slates*, which continues interstratified with *greywacke schists* to the top of Roonung Pass. The alternations of these strata are frequent, sometimes the one and sometimes the other rock prevailing in thickness.

These beds are evidently the first indication of the transition, or lowest secondary formation of geologists, and extending across or through the Roonung Pass, downwards to Soongnum, they are seen to support strata of compact *greywacke*, and beds of *quartzose* rock, apparently analogous to and holding the place of the *old red sandstone* of Europe.

The town of Soongnum stands in a valley immediately between the Roonung Pass in its front and the Hungrung Pass in its rear. In front, the range of hills which form the right side of the Rushkoolung valley are composed of an *argillaceous* series, consisting of *clay stones* and *greywacke slates*, of different textures and degrees of induration, and dipping to the S.W. The strata in the rear of the town, forming the left bank, dip, on the contrary, to the N. E. and are composed of *greywacke slates*, compact *greywacke*, *old red sandstone*, and a superior stratum of *limestone* and *greywacke*. These towards the summit of the range gradually change their dip, and rise up again to the S.W., the whole being surmounted by a bed of dark blue secondary *limestone*, containing portions of *clay* and *silex*. This formation extends along both sides of the Rushkoolung valley, even to the Manerung Pass above Manes in Spiti, a distance of about seventeen miles. About seven miles from Soongnum, copper veins occur in their strata of white *quartz* rock, and *veinous quartz*, lying occasionally between, or ramifying through, the *greywacke* and *old red sandstone*. The

last mentioned rock varies much in colour and in texture, the lowest stratum being *white*, and scarcely distinguishable from *quartz* rock, but changing gradually to a faint tinge of *pink*, becoming deeper as it passes upwards, until its colour is of a dull *purplish* hue.

These strata are sometimes separated by a very thin layer of soft whitish *marl*. The crest of the Hungrung Pass is 14,837 feet above the level of the sea, and is composed of dark blue *limestone*. The range on which this Pass is situated divides Kunawur from Hungrung,—a district inhabited by Tartars, who are subject to Bussaher.

Descending from the Pass to the village of Hungo, the road passes over numerous alternations of blue *limestone* and *greywacke slates*, resting upon white *quartz*, which lower down gradually passes into a greenish variety of the same rock.

These strata all dip to the S.W., and are probably an outcrop of those which run in a N.E. direction from behind Soongnum, and thus shew the effects of what may be termed a *double upheavement*, or lifting of the same strata at two different points. The lofty *granitic* peaks which tower up to the right of the Pass, at once shew that they have been instrumental in forming the S.W. dip, and it is more than probable that the same rock might be discovered also protruding through the strata on the opposite exposure.

The following *partly* imaginary section of Hungrung, may serve to explain my meaning:—

(See plate)—FIG. 3.

Supposed Section of Hungrung Mountain.

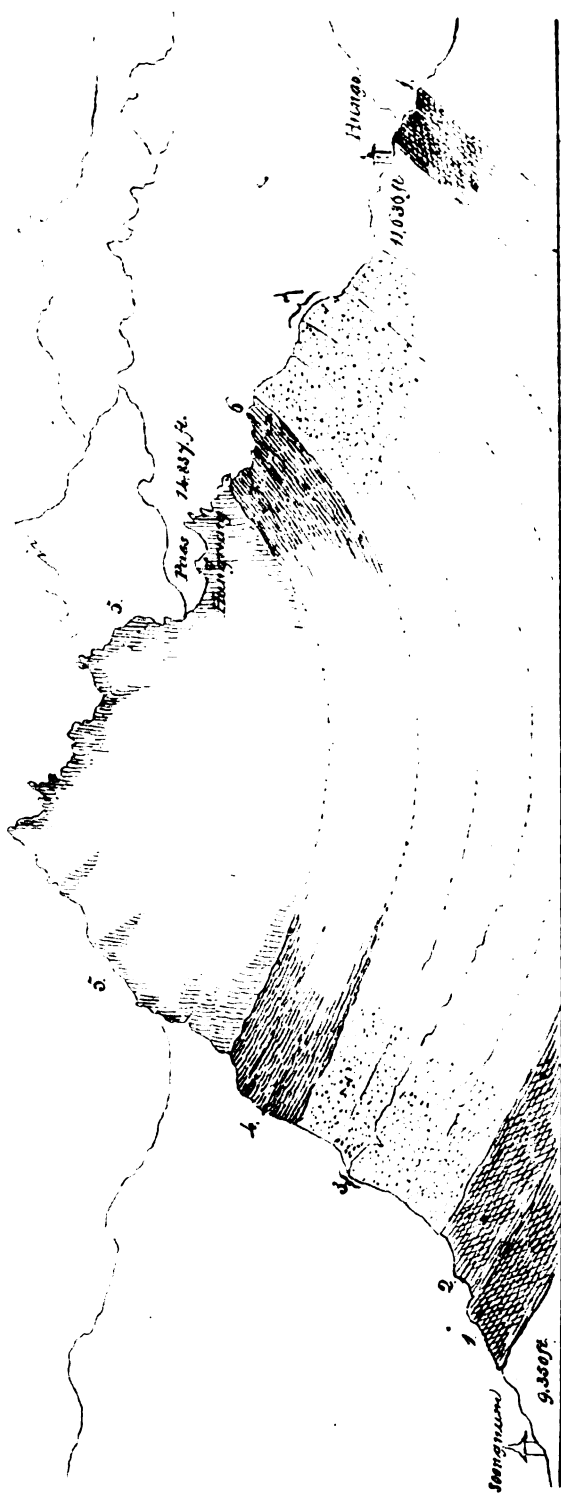
Strata of *greywacke slates* are met with for a few miles after leaving Hungo; but they disappear as we approach Leeo, or rather, from the great descent of the road, they are left far above, while the base of the mountain is found to be a dark coloured *gneiss*, traversed and intersected in every direction by veins of white *quartz*.

Leeo stands in a kind of basin, surrounded on all sides by lofty hills of *granite* and the same dark *gneiss*; but the lower parts of them are overlaid by strata of the secondary series, consisting chiefly of *greywacke* and *shales*. On the sides of the surrounding hills exist strong indications of the former presence of a lake, in the lines of water-worn stones and pebbles that now rest many hundred feet above the river Lee.

These appearances were long since pointed out by Dr. Gerard, who though knowing nothing of geology, was at once forcibly struck with

Supposed Section of Hangnang Mountain

Fig. 3.



Kunawur

Tartary

- 1. 1. Greywacke Slate... 2. Compact Greywacke. 3. Old Red Sandstone
- 4. Strata of Greywacke and Limestone 5. Blue Limestone
- 6. Strata of Limestone and Greywacke 7. Quartz Rich: white and Green

the conviction, that nothing but the former presence of deep waters could account for the phenomena here so plainly exposed to view.

In his conjectures on this head, that enterprising and unwearying traveller was undoubtedly correct.

In the bed of the Lee, where it is crossed by a wooden *sangho*, a thick bed of white *quartz rock* is seen dipping to the S.W., and as we mount the hill in the direction of Chungo, beds of *boulders*, and disjoined masses of *granite*, *gneiss*, and *mica slates* hurled from above, are passed over, now in many places overlying the secondary *shales*.

At the village of Chungo, which is the last on the left bank of the Lee, under the government of Bussaher, the most decided indications of the former presence of a deep lake again occur. To the eastward of the level patch on which the village and its cultivation stands, rise three lofty and rugged mountains, whose shattered sides present sections of the same strata as those noticed at Leeo: namely, deep beds of dark *gneiss* and *mica slates* intersected by *granitic* and *quartz* veins of various thickness; these strata dip down towards the west, and as they approach the village, are lost beneath the vast accumulations of alluvial soils, which here, as at Leeo, mark the former presence of deep and tranquil waters.

To the southward these deposits consist almost entirely of thick beds of *clays*, *sands*, and *boulders* of every size, rising high above the level of the village; while to the NNE. are again presented the same alluvial deposits of a greater thickness, and accompanied in addition by a deep and extensive bed of a pure white and friable *gypsum*. This bed is perhaps a most valuable discovery in a geological point of view, as tending to show the nature of the waters from which it was precipitated. This thick *gypseous* bed is overlaid by the *sands*, *clays*, and *boulders*, which have already been noticed. At the fort of Skialkur, on the opposite or right bank of the river, about $3\frac{1}{2}$ miles from the village of Chungo, this *gypsum* is likewise seen overlying the transition series of alternating *shales* and *sandstones*.

These deposits are now at the height of 2,000 to 2,500 feet above the present level of the river's course, or at an elevation of 12,000 to 12,500 feet above the level of the sea.

The three mountain peaks of *gneiss*, which rise up to the eastward of Chungo, are divided from each other by narrow glens, through which streams flow down to join the sea, between which and the base of these mountains, the whole alluvial deposits have been swept away, and the present cultivated plain of Chungo is therefore situated far below the surrounding alluvium, which rises like walls on either side of it.

As we proceed from Chungo towards Spiti, the road lies at first over the alluvial accumulations above-mentioned, for two or three miles, when from

the abrupt nature of the primary rocks that are hence met with, they cease to exist, except far below where a wide and shelving plain lies along the river's side, and which is entirely composed of them. From the point where the road leaves them behind, for a distance of six miles, the strata are again of *mica*, *slate*, and *gneiss*, varied with the same carious veins of *granite* and *quartz* as those of Leeo and Chungo. At this point the mountains are separated by a rapid river called the Paratee, which runs down from Chinese Tartary and joins the Spiti near Skialkur. Here the primary series may be said to disappear, and the Spiti road crossing the Paratee by a natural bridge of stone, which is formed of several large masses of *gneiss* fallen from above, and wedged firmly together over the stream, brings the traveller at once upon the secondary class. The lowest strata are therefore just perceptible where the waters cut their way through, and we thus catch a glimpse of the *gneiss* of the opposite bank, above which occurs a *talcose schist*, white *quartz* rock, and *clay slate*, dipping to the S. W. Above these are alluvial deposits similar to those of Chungo, and extending for a mile or two inland from the river, forming a flattened plain, on which stands "Kewrick," the first village of Chinese Tartary. Here again a portion of the deposit has been swept away by a descending stream, exactly as at Chungo. It is worthy of remark, that all these alluvial deposits are the deepest and most extensive when the surrounding hills have the most gradual slope, and where they retire so as to form recesses; while on the contrary, as might be expected, where the dip of the strata is rapid or acute, scarcely any trace is left of the former existence of a lake, because the deposit has been swept away by the outrush of the escaping waters.

These accumulations are likewise the most extensive at the lower end of the Spiti valley, where alone the *gypsum* is to be found. To this fact I would beg to call special attention, as it will be hereafter alluded to, and prove of some importance in the explanation of these *diluvial* and *alluvial* deposits.

From Kewrick the road runs over hills, which are entirely of the secondary class, being frequent alternations of the same rocks, as *greywacke* and *claystones*, *limestones*, and *sandstones*, and in one or two instances a trap of *greenstone* is also seen, both stratified and amorphous.

From Kewrick to the village of Larree, which is the first inhabited place in Spiti, we travel first for four miles over the edges of strata of *clay slates* and accumulations of *debris*. From the decomposing state of these strata, caused the effects of weather and a portion of *alum*, which causes them to scale off in soft flakes, the whole of the hills on either side of the Spiti river have a charred and blackened aspect, which combined with their arid and barren nature, gives a sad and melancholy appearance to the country, by no means cheering to the weary traveller.

The dip of the strata is now uniformly to the S. W., and generally at an angle of 45° , though here and there they rise abruptly to a nearly vertical position, denoting an excess of the upheaving forces from below. As we approach Larree after crossing the Gew river, the bed of which is of *greywacke slate*, we come upon a thick stratum of pure white *quartz* rock, which appears to be a continuation of the same rock which was seen at Leeo on the opposite side of the range; in contact with this, and immediately resting upon it, is another bed of siliceous rock, which passes gradually into thin strata of flinty slate. Upon this rests *clay slate*, which then alternates frequently with *greywacke* and *sandstones*. Further on we perceive masses of *gypseous breccia* formed of angular fragments of *argillaceous schists*, encrusted or cemented together by *gypsum*. This rock, if it be entitled to the name, owes its origin to the same waters which deposited the *gypsum* beds of Chungo and Skialkur; it is found overlying the edges of the true strata from which it has been formed, and occurs in rude and mis-shapen masses. To this *breccia* I would also call attention, as serving to shew a change in the waters of the lake, or at all events a decrease in the proportion of their *saline* properties. Farther on still, and nearly opposite the village of Somra, a stratum of trap is seen to occur between *shales* above and *sandstone* below; it is conformable to the true strata with which it is clearly interstratified, not causing any dislocation of the series. Beyond Larree, however, the same rock occurs again, in one place interstratified with *greywacke* and dark *blue limestone*, at another running up vertically in an *amorphous* mass through the strata, which it first dislocates and then overlies. In this case, the strata on either side of the Spiti dip to the S. W., while the rocks through which the trap has more immediately passed or been injected, are thrown boldly and abruptly from the usual course to the westward. The strata on the opposite side of the river are at the same time raised from the angle of 45° nearly to a horizontal position, and after some twisting of the strata, again with apparent difficulty regain their wonted S. W. dip. Here it is evident that the trap in question has been the molten vein whose struggles to burst upwards through the superincumbent weight of strata has been the agent which has thrown them into their present inclined positions, and in its upward course has first become partially interstratified with those which possessed the least induration or means of resistance, and then finally, as it burst through all obstacles, flowed over them in a broad sheet of molten matter, which as it cooled assumed the present solid and compact texture.

Of such having been the fact, we observe proof in the vein of vertical trap acting as a support, or upright as it were, from which the strata now incline and dip downwards.

As, however, trap is known to possess, "in a general sense, the universal common character of being unstratified, and posterior to the rocks with which it is connected,"* it becomes necessary in here stating, that it is conformable to and interstratified with those of the secondary series, to offer a few theoretical remarks on the probable means by which this partial stratification has been produced.

The interstratification of this rock, where it occurs, is of very inconsiderable extent, when compared with that of those with which it is associated, possessing by no means the wide and almost universal range of the primary and secondary series, but being on the contrary, "in a great measure limited to particular spots, more or less extensive, and to be, if separately considered, partial and independent productions."†

Let us then suppose that these secondary strata were once (which in fact they really were) horizontal deposits from the waters, which it is generally supposed were instrumental to the formation of the series to which they belong.

We shall thus perceive them to have been deep *unconsolidated* masses of sands, covered by muddy layers, which we now term *shales*. The struggles of the molten matter to procure access to the surface would, from the *heat* and *pressure* engendered by its upward course, have the effect of vitrifying and indurating the sands through which it forced a passage, and of converting them into strata of *sandstone*, while the *shale* or muddy deposit next in succession being lighter and less massive than the stream of trap, would probably rise and yield a passage between itself and the *sandstone* for the molten matter to form a stratum, somewhat in the same manner as oil would give place to a stream of water if injected through a tube or aperture below it.

The muddy deposit, however, being hardened by contact with the *lava* and by the general pressure of the uprising strata, would burst as the *sandstone* had already done, and yield a passage to the trap, which flowed through and overspread them at the surface.

Should it be contended that the outburst of a stream of *lava* such as that I have described the trap to have been, would have expended itself in a shower of ashes or cinders, rather than have assumed the stratiform structure it now exhibits, I would remind the reader that the secondary rocks are supposed to have been deposited in the bosom of a tranquil water, and that that water formed either extensive lakes or portions of the sea.

* † McCulloch's Geology.

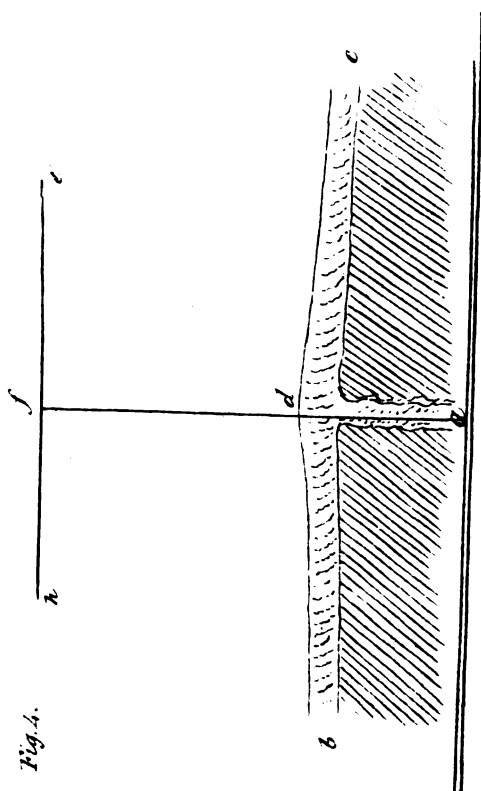


Fig. 4.

The upheaving *lava* current had therefore not only the weight of the superimposed deposits, but the pressure likewise of an enormous volume of water. It becomes more than probable, therefore, that this aqueous pressure would effectually check the tendency to produce cinders and ashes, and thus as the stream poured upwards through the deposits and came in contact with the waters, the molten matter would extend itself along the bottom of the lake, and thus overlie the secondary strata, as in the present instance.

For farther information on this subject, I would refer the reader to *De la Beche's Geological Manual*, where will be found some very just and apposite remarks on the point in question.

"It being by no means probable," he says, "that the density of sea water beneath any depth which we can reasonably assign to the ocean, would be such as to render it of greater specific gravity than liquid *lava* ejected from a volcanic rent, situated beneath the sea, it would follow that so long as the *lava* continued in a state of fusion, it would arrange itself horizontally beneath the fluid of inferior specific gravity." The question then arises, how long a body of *lava* in fusion would remain fluid beneath the waters of the sea? The particles of water in contact with the incandescent *lava* would become greatly heated, and consequently, from their decreased specific gravity, would immediately rise: their places being supplied from above by particles of greater density and less temperature. Thus a cooling process would be established on the upper surface of the *lava*, rendering it solid.

Now as the particles of fluid *lava* would be prevented from moving upwards by the solid matter above, pressed down by its own gravity and the superincumbent water, they would escape laterally, where not only the cooling process would be less rapid, from the well-known difficulty of heated water moving otherwise than perpendicularly upwards, but where also the power of the fluid *lava* to escape resistance would be greatest. (*See plate*)—FIG. 4. Let *a* be a volcanic rent, through which liquid *lava* is propelled upwards in the direction *d f*: the *lava* being of greater specific gravity than the water *b h e c* it would tend to arrange itself horizontally in the directions *d b d c*. The surface *b d c* having become solid, the *lava* would escape from the sides *b* and *c*, spreading in a sheet or tabular mass around; and this effect would continue so long as the propelling power at *a* was sufficient to overcome the resistance opposed to the progress of the *lava*, or until the termination of the eruption, if that should first happen."*

This clearly stated theoretic problem may now be successfully reduced to practice, and will correctly and exactly apply to the phenomenon under

* *De la Beche's Geological Manual*, p. 125.

consideration. The truth therefore of *De la Beche's* proposition will be at once established.

(*See plate*)—FIG. 5. Let us suppose these now inclined strata to be in their original horizontal position, and 2 and 3 forming beds of unconsolidated sandy and muddy deposits beneath the waters of the lake or sea *a c e h*.

Then *a' a a a*, &c. is a vein of *lava* or molten *trap*, which in its endeavours to find vent, upraises and bursts through the solid primary series denoted at 1.

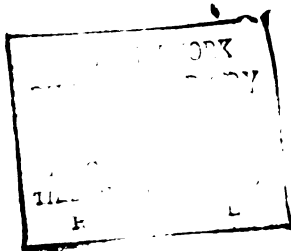
By the heat and pressure thus engendered, the *lava* indurates the sand at 2, and converting it into *sandstone*, breaks through it also, and is thus brought in contact with the muddy deposits represented at 3. This deposit being of a specific gravity inferior to the stream of *lava*, is naturally displaced and forced to contract and furnish room for a stratum of *trap* at *a a a*.

The heat and pressure, however, continuing, speedily and almost on the instant, converts the muddy deposit into *shale* or *slate clay*. And the *lava* current bursting through it and the superior stratum of *limestone*, comes at length to the surface, and in contact with the waters. Here then commences the facts detailed theoretically by *De la Beche*, as already quoted, and the stratum of *trap* spread over the surface of the now inclined and consolidated strata of deposits; while the waters of the lake or sea being displaced by the upheavement, effected an escape through the various channels afforded by the disruption of the uprising strata.

It may possibly be objected that the occurrence of a compact stratum of *limestone* above the *shale*, and in contact with the *trap*, will at once invalidate the theory here proposed, from its being a known fact, that when heat is applied to *calcareous* matter, the *carbonic acid* is driven off, and the remaining *lime* rendered infusible.

I shall endeavour therefore to obviate such an objection, by quoting and establishing a theory long since propounded by Dr. Hutton, which at the time of its proposition was looked upon as an ingenious, but perfectly untenable, doctrine.

"He had asserted that *calcareous* rocks, like every other, had been subjected to the action of heat. But it was well known that when heat was applied to this class of rocks the *carbonic acid* was driven off in the shape of *gas*, and the remaining *quicklime* become infusible. Dr. Hutton indeed had answered this by suggesting, that the pressure of the superincumbent ocean was sufficient to confine the *carbonic acid*, and to cause it to act as a flux on the *quicklime*. His theory, however ingenious, was so abundantly gratuitous, that it by no means satisfied even his own disciples. After Dr. Hutton's death, Sir James Hall ascertained by numerous experi-



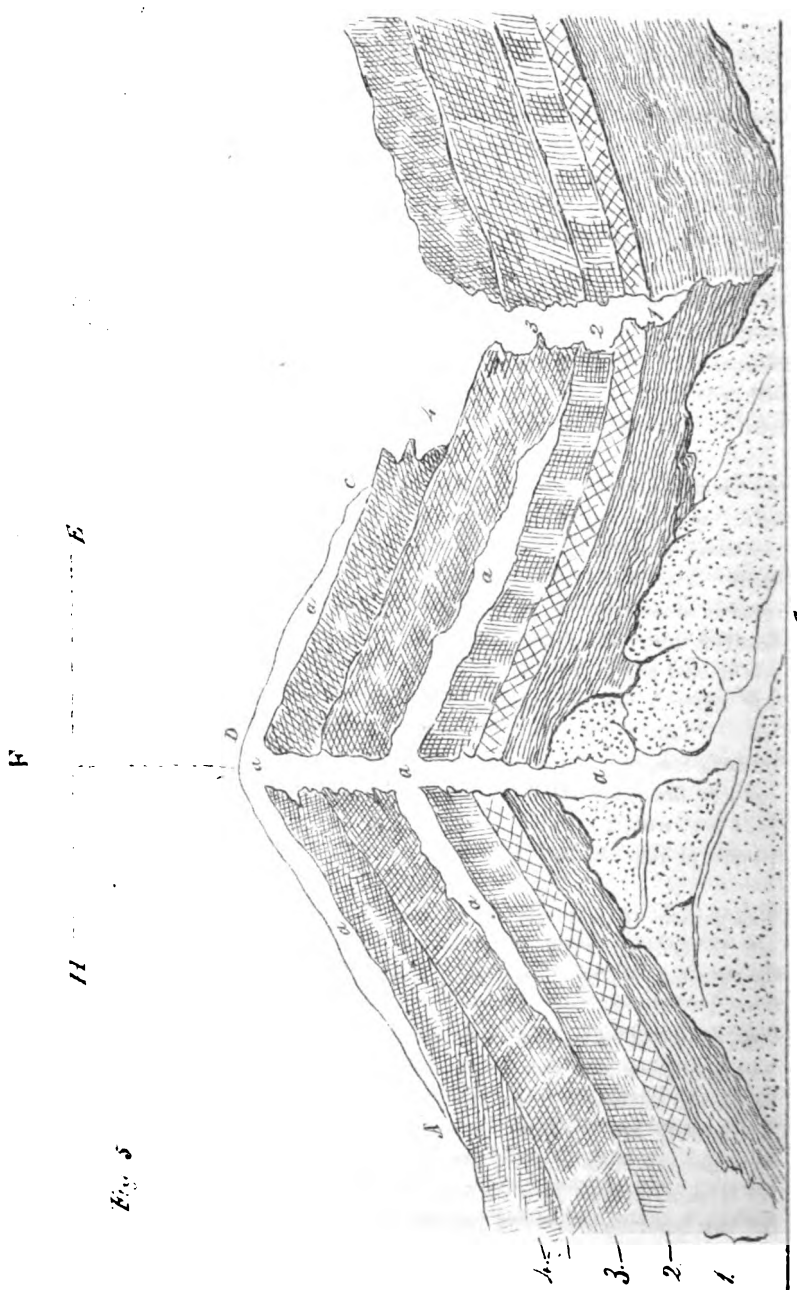


Fig. 5

ments that *carbonate of lime* might readily be fused when exposed to heat, if it were at the same time under a pressure not greater than Dr. Hutton's theory required, or about a mile and a half of sea."*

Now it is easily perceptible, that the result of these experiments is in exact accordance with the effects which the theory here proposed would give rise to.

We have supposed that the present solid strata were once soft and aqueous deposits beneath a vast depth of waters; we thus perceive a beautiful and conclusive illustration of Dr. Hutton's theory in the fact, that when the *heat* generated by the pressure and condensation from below acted on the superior *calcareous* stratum at 4, that very stratum was then actually subject to the pressure of the superincumbent waters at *A C E H*, which by preventing the escape of the *carbonic acid gas*, and causing it to act as a flux upon the *quicklime*, converted the stratum, as Dr. Hutton had suggested, into the compact state which it now exhibits.

As theoretic speculations, however just, and however much in accordance with the phenomena observable, they may prove to be, may nevertheless be deemed misplaced in a paper of this kind, I shall leave the subject for a more fitting occasion, and now pass on to a consideration of the remaining facts exhibited in the strata of the Spiti valley.

From Kewrick to the village of Leedung, the strata may be said to be of the same descriptions, namely, *talcose schist*, *quartz rock*, *greywacke slates*, *clay slates*, *sandstone shales* and *trap*, all except the last alternating frequently with each other.

A precise description of each rock belongs rather to the department of the mineralogists than to that of the geologists, and I therefore content myself with pointing out the series rather than individual species, in order that I may hasten on to the theory which the appearances presented suggest.

Passing therefore from Larree via Pokh to the fort of Dunkur, we find the strata to consist of the same alternations of rocks as those already mentioned; but at this latter spot the appearances denote a struggle for the direction of the dip, which merits some attention. The range of hills running along the right bank of the Spiti opposite to Dunkur have a N. W. by W., and S. E. and by E. direction, and at four miles below the fort the strata dip uniformly to the S. W. From that point, however, or near the village of Manessa, it would seem that an upheavement had taken place through or along the centre of the range, causing the superior strata to assume a pent or roof-like appearance, throwing them on one side with

* Journal of Science, p. 4.

an acute dip to the N. E., while the opposite side preserved the S. W. direction at a less acute angle. In such cases where a section is obtained by a water course, the strata forming the heart or interior of the range are seen twisted in every grotesque direction. These strata consist of thick beds of *argillaceous schists* and *sandstones*, and what strikes one as singular in their disposition is, that the upheavement has had the effect of throwing the outcrop of the *sandstone*, or superior stratum dipping to the S.W., higher than the portion which falls to the N.E. Thus the joining of the strata is not at the summit of the range, but the rocks of the N.E. side are seen lying against those of the opposite direction, whose upper edge, or outcrop, juts out above them. (*See plate*)—FIG. 6.

Passing on from Dunkur we come to the Lingtee river, which joins the Spiti.

Here again a double upheavement of the strata appears to have taken place, which will be better understood by a reference to the annexed sketch, and which may serve as an example in all similar cases. (*See plate*)—FIG. 7.

On the right bank of the Spiti, the strata fall acutely to the river in a N. E. direction, as already pointed out, while on the left bank, although they at first dip to the same direction, they are seen first gradually to rise to a nearly horizontal position, and then to dip backwards again to the S. W. This occurs on the left bank of the Spiti and the right bank of the Lingtee at the point where the two rivers meet.

On the left of the Lingtee the strata first dip to the N. E., and then after many extraordinary twists and contortions, yield, as it were reluctantly, to the contrary dip, which turns them back to their old and proper direction of S.W.

In all these cases it will be found that the rocks are rent asunder, and the disruption now forms deep *khuds* or glens, through which at present a stream or river descends.

About six miles from Dunkur stands the village of Leedung, where the strata consist, in an ascending order, of *greywacke* and *clay slates*, dark blue *limestone shales*, *limestone* and *sandstone*, repeated in many alternations.

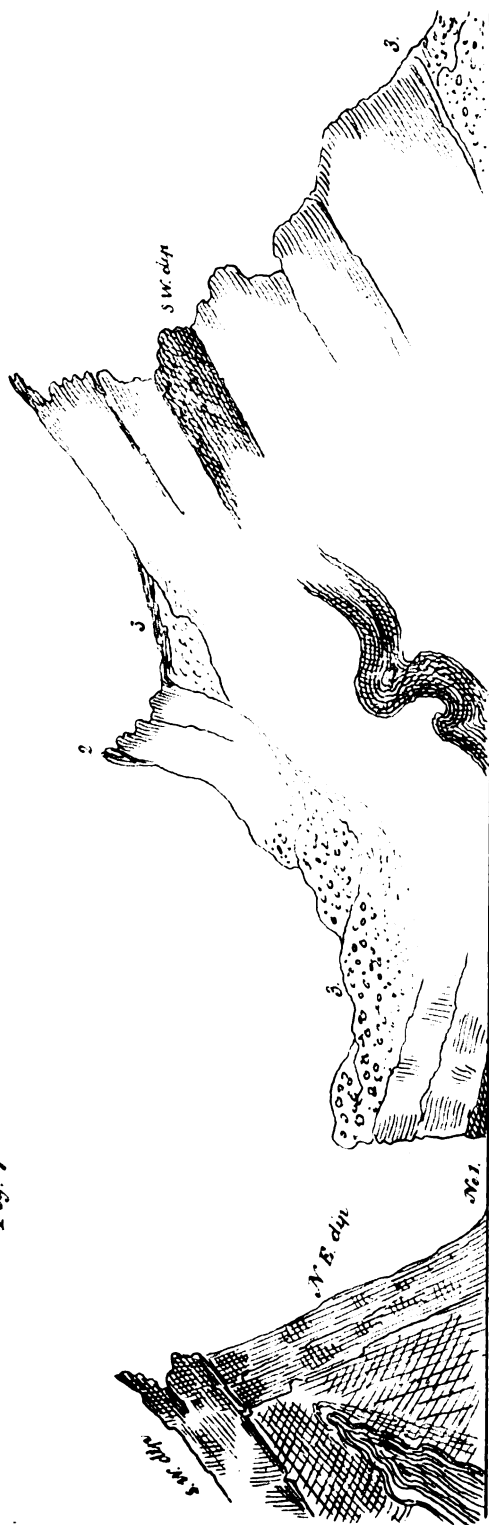
Leedung stands at the height of 12,037 feet above the sea, and the strata just mentioned rise precipitously above it to the height of from 3,000 to 6,000 feet more, or to 15,000 and 18,000 feet above the sea. The highest stratum here appeared to be of *sandstone*, resting upon *shale*.

To the N.E. of this village rises a Pass, which has an elevation of 15,247 feet, and here along its summit, where the streams which descend

Fig. 6.



Fig. 7



N. B. The precise nature of these strata is undetermined from the impossibility of procuring access to them, but they appear to consist of Contorted Shales, and limestones surmounted by sandstones.
 No. 1 Bed of Spiti River. 2 Vertical strata. 3.3 Beds of debris and fragments from above.

from the snows have worn numerous channels through the loose and decomposing *shales*, occur the fossils which were long ago discovered by Dr. Gerard. These consist of various species of *ammonites*, *belemnites*, *orthoceratites arca*, and some others; but all partaking of the same decomposing nature as the *shales* in which they occur, so that it is next to impossible to procure a perfect specimen, or to prevent its falling to pieces if obtained.

The *limestones* which here alternate in the series, are sometimes wholly composed of shells, and are of a dark grey colour, while at the height of 14,712 feet occurs a bed of a whitish grey colour, and almost free from shells, but imbedding large rounded masses of various sizes, which when broken are found to be composed wholly of the dark shell *limestone* already mentioned.

Among these hills there is great confusion in the direction of the dip, the strata sometimes inclining to the S.W. or N. E., while at others they are N.N.W., and to almost every point of the compass. These masses are, however, generally limited to small extent, and appear like fragments torn from the true or main direction by the force of the upheaving agent. These strata extend along the range for many miles farther up the valley, but no fossils were apparent at any place, except on the heights above Leedung and Larra. They exist, however, in the form of shell *limestone* along the range immediately leading from the lake Chummorareel; but at this season the whole range lay so deeply buried in snow, that the route was impracticable, and I was obliged reluctantly to quit the fossil site, not half satisfied with its investigation.

From the nature of the rocks in this part of the valley, and the reports of those who have visited lake Chummorareel, I should feel strongly inclined to believe that it is situated among the *Lias clays*. Puttee Ram, the Tartar wuzeer, who has often visited the spot, assured me that the lake was surrounded by high hills composed of *earth* of various colours, red, yellow, blue, &c. and that the country around was all of similar *clays*, and not composed of rocks like the lower parts of Spiti, although sometimes above the hills of clay, large masses of stone were also found.

Such a description, all rough though it be, would lead one to expect the *Lias* beds resting on the red *marle*, and surmounted by the *sandstone* series above the *oolite*. The subject, I am sorry to think, must thus far remain obscure, until some more fortunate traveller shall venture upon those interesting scenes.

From this slight sketch it will be seen that the geological series from Kotgurh to the neighbourhood of Soongnum, in Kunawur, is that of the primary class; while thence, to the head of the Spiti valley, we find,

with slight interruption, the transition or lowest secondary series containing fossil exuvise of marine *Mollusca*.

From the point of junction of the Spiti and Sutledge to the head of the Spiti valley, we find every thing indicating the former presence of an extensive lake. These indications consist in beds of friable or earthy *gypsum*, *clays*, *sand*, and rolled *pebbles* now left high in horizontal strata above the course of the river at the present day.

These accumulations are also seen to be the thickest and most extensive at the lower end of the valley, where the mountains form recesses, and where the slope is the most gradual. We find the *gypseous* beds alone at the lower end, and we also find them growing thinner and dying out as they approach the higher and narrower part of the valley, until at last their presence is only to be traced in the incrustations of other rocks.

The *clays* and *sands* which have been deposited upon these beds are, on the other hand, universal throughout the valley wherever they could find a resting place, and they pass on after the *gypsum* has ceased up to the higher portion of Spiti, where at length they yield to *pebbles* and *boulders*.

I have called attention to these facts, because I shall presently show by what means such an arrangement has taken place.

It will, however, first be necessary to state the theory which these appearances suggest, and then to show how the phenomena presented to our view, are in accordance with that theory.

Theory of the Spiti Valley.

We have already seen that the valley bears every appearance of having been at some remote period the bed of an extensive lake, which at length, by the accumulations of its waters, and its enormous pressure upon the rocky barriers which confined it at the lower extremity of the valley, burst forth with irresistible power and devastating effects down into the district of Kunawur. I shall endeavour to trace in detail the circumstances which may have led to this outburst of the Spiti waters.

The first formation of such a lake may have occurred from one of three distinct causes, namely :—

First. If we allow the existence of these vast mountains previous to the flood, the lake may have accumulated in the bosom of the valley from the melting of antediluvian snows, and thus, (supposing the Mosaic narrative to be correct,) it will be seen, that although originally composed of fresh waters, it must have changed its nature and become salt at the period of its submersion by the deluge; and again in after years, when that deluge

had subsided, it would have gradually regained its freshness, and parted with its saline properties by the constant accession of streams from the beds of snow surrounding it.

Secondly. If these mountain ranges were formed at no remoter period than that assigned to the *subsidence* of the Mosaic deluge, the lake may have been formed simply by the accumulation of the snow streams from the heights above, *since* that last grand catastrophe.

And, *Thirdly.* If suppose these mountains to have been upheaved by *submarine volcanic* agency during the convulsions attendant on the subsidence of the deluge, we may assign the origin of the lake to the enclosing or retaining of the oceanic waters, as the ranges rose upwards from beneath the waves.

I shall presently speak of the most probable of these three causes, and in the mean time taking for granted the former existence of the lake, proceed to show by what means it has disappeared.

The walls of the valley, then, we must suppose to have been at one period continuous, without an outlet; thus forming an extensive basin containing a lake of water, which from its vast expanse and magnitude, might have been almost termed an inland sea.

The surrounding barriers of this lake rearing their heads aloft to an elevation of from 16,000 to 20,000 feet and upwards above the level of the present sea, were then, as they still continue to be, the never-failing receptacles of eternal snows, which furnished streams of ever-running waters, all emptying themselves into the broad lake beneath.

This constant increase would of course in a little time cause the waters to rise, and overflow that portion of their bounds which attained the least elevation, and accordingly we find it actually to have been so at the confluence of the present stream with the river Sutledge.

This overflowing would at first proceed quietly, and with a gently exerted force; but as the action of the never-ceasing stream gradually carved a deeper channel over the rock, a greater body of water would flow down, bursting through and tearing away blocks of increasing magnitude, until its weight and constant action having loosened and undermined the bank, the massive barrier which had hitherto sustained this enormous weight, now weakened by the repeated loss of its various supports and out-posts as it were, would at length give way before the overpowering pressure of the waters, and yield them a passage to the vales below.

Bursting with headlong fury through this, its long sought aperture, what devastation must have attended the downward passage of such a body of water! Huge fragments of rocks, together with the soils and productions of whole districts through which the torrent rushed, must have been swept off before it, and have been deposited at various distances from

their original sites, where combining with other soils, they would form strata peculiar to those situations.

It is probable that these sudden overwhelmings of the district now called Kunawur, may have happened more than once, both from this and from other lakes; for although the Spiti lake had burst through its rocky barriers and found an outlet for the superabundant waters, it would merely have expended itself to a level with the opening it had made, at which point it would again remain until the accumulating supplies from the snow-clad peaks above, and the never-ceasing flow and action of the waters upon the already ruptured rocks, should again have brought about a similar outpouring of its waves, and thus would the lake gradually sink by the same never-failing means, from level to level, until its whole body of waters was expended, and so leave those trickling and apparently insignificant snow streams which had ultimately caused its expulsion from the valley, not only to usurp its former bed, but to form by their united waters the present river Spiti.

From these facts a question naturally arises, as to the probable source from whence the vast beds of marine exuviae found in the higher portions of this valley have been derived, and the answer to it must entirely depend upon the origin we assign to the lake itself. That is, if these mountains and the lake were in existence before the Mosaic deluge took place, it will follow, that the quality of the waters must have undergone a change from fresh to salt by the influx of the ocean, and it might on this account be contended by some that the marine shells rising with the waters, were here left living when that ocean again subsided to its proper bed; that as from that period the waters of the lake would gradually part with their saline properties, as the snows around continued to pour down their limpid streams, causing the lake again to resume its pristine freshness, it becomes evident that those marine animals, exclusively formed and adapted for an existence in salt waters, could only have survived there for a short time, and would then have been deposited in one vast accumulation. But had this been the case, the exuviae must have belonged to species *still existing* in the seas, *whereas* we find them all to be the spoils of *extinct animals*; and again, had such been the case, they would have been imbedded in strata of the *tertiary formation*, whereas, we find them in those of the *secondary deposits*, which are referrible to a period *long antecedent* to the Mosaic flood.

Thus, we must at once abandon this first position.

Secondly. If we suppose that the lake was formed *at and by* the deluge, and afterwards by the constant accession of snow water became fresh,—the effect, as regards the marine deposits, will still be the same; and consequently this second supposition must be abandoned likewise.

As it is therefore evident that the presence of the fossils can be attributed to neither of these sources, we are at once led to the conclusion, that the vast ranges of the Himalyan mountains were *not in existence previous to the Mosaic deluge*, but that the rocks and strata which they now exhibit were at that time horizontal, and forming part of the bed of the antediluvian ocean. Of this I shall adduce positive geological proof in the sequel.

The fossils therefore which are found imbedded in these higher tracts, did not become extinct at the deluge, but at a period long previous to that great event, when the secondary formations in which they occur were deposited, and which period though hitherto passed by unnoticed by writers on geology, is nevertheless clearly pointed out by the sacred historian.

In order more satisfactorily to ascertain the causes by which animals once living in the depths of ocean have been left imbedded in rocks now towering to a height of more than 16,000 feet above its present level, and at a distance of many hundred miles from it, it will be necessary to skim lightly over the events which have occurred on the surface of our globe from the time of its creation, "until that last catastrophe to which these mountains owe their existence. "Geologists," says Cuvier, "have hitherto assigned but two revolutions to account for the phenomena which the strata of the earth now exhibit, namely, the creation, and the deluge, which he *rightly* thinks are insufficient, although he *erroneously* pronounces them to have been numerous." Nor is it surprising that he should have deemed them inadequate to account for such phenomena, since the first of these periods was no revolution at all, but occurred *before* the vegetable and animal races, whose remains constitute the chief phenomena of our strata, *were created*, and therefore it could have been in no wise instrumental either to their destruction or deposition. It is, moreover evident, that this first revolution of geologists could in reality be *no revolution*, but a *creation*! A revolution must imply the overthrow or upsetting of an *already established* order of things; while here in this first period we know that there was *no overthrow*, but a *setting in order* of things which had *not as yet existed*; therefore it was a *creation*, or calling into being an order of things which subsequently in after years *was to be overthrown* through the disobedience of created beings.

The separation therefore of land and sea, by which our earth was first called into existence, can be looked upon as only a creation, and such indeed it is termed by the sacred historian, for he tells us that in the *beginning* the materials from which our land was to be formed were called into being, and that on the third day, the interim being occupied in perfecting other arrangements all tending towards its welfare, the earth was separated from the waters, and its existence commenced. True, the record mentions two and only two distinct revolutions, but the Mosaic, equally with the

mineral geologist, has disregarded and passed over the first of them which occurred, *not during* but *subsequent* to the Creation, when man first transgressed the commandment of his Maker, and drew down, in consequence, the *curse* of an offended God upon the *earth* and its *productions*. Thus it would appear, that geologists are right in referring the fossil exuvise of the secondary strata to a revolution long prior to that of the *deluge*, and they have only erred in not assigning to it the actual period pointed out by the record.

The second revolution, or *deluge*, is too clearly marked, and its consequences too obvious to escape the notice of any one; but the historian enters into no details of the means by which the first was effected, although he clearly points out the effect of it. This difference in the seeming importance of the two revolutions may have arisen from the fact that the first did not, like the second, involve the loss of life to the human race, and therefore the record is content to point it out merely by its *effects*, leaving us at liberty to *infer* the causes.

Asserting therefore, with the inspired historian, that our planet, together with all its goodly furnishing of vegetable and animal life was created and finished in the space of six days, each of the same duration as these of our present computation, and that on the sixth and last day the progenitors of the human race were also created, and were consequently contemporaneous with the whole animal kingdom, as constituted before *the fall*, I shall endeavour to point out the period when, in my opinion, the marine animals, whose exuvise are imbedded in the secondary strata of the Spiti valley, ceased to exist.

Within the limits, however, which it is found necessary to assign to the present paper, it cannot be expected that I should much enlarge upon the time at which, or the causes by which this first great change in the temperature of our earth occurred, and I shall therefore pass it over with a slight allusion only, and with the less regret, since I hope at no distance of time to lay before the Society a theory of the changes which have taken place on the surface of the earth, from creation to the present time.

If in succeeding ages a writer were to state that the various countries of our present earth had suddenly undergone a great change for the worse in the prolificness and character of their vegetation, would not our posterity justly look upon it as an indication of a well marked revolution and change of temperature?

And would they not naturally seek for a corresponding change and loss in the genera and species of the animate classes?

Assuredly they might reasonably do so; then why do not we, who have a parallel case presented to us in the pages of Holy Writ, seek for traces of

that loss of animal life which must ever be a consequence of any great change or loss in the temperature and vegetation of the earth ?

Such a revolution, although no details are given of its operations, is clearly implied in the effects which are recorded in this simple language of Scripture :—

“ And unto Adam, he said, Because thou hast hearkened unto the voice of thy wife, and hast eaten of the tree of which I commanded thee, saying thou shalt not eat of it :—*Cursed is the ground for thy sake ;—in sorrow shalt thou eat of it all the days of thy life ;—thorns also and thistles shall it bring forth to thee ;* and thou shalt eat the herb of the field. *In the sweat of thy face* shalt thou eat bread,* until thou return unto the ground ; for out of it wast thou taken ; for dust thou art, and unto dust shalt thou return.”

That earth which had hitherto profusely yielded, *freely and gratuitously*, its choicest productions, now shrinking beneath the frown of Him, before whose wrath all nature trembles, refused to supply even the common necessities of life, unless wooed into compliance by the sweat of man's brow, and the toil and labour of his hands.

Can a more convincing proof be required of a change of temperature, and of the first great revolution on the earth ?

Or, can it be thought necessary to assign to the fossils of the secondary strata a more remote period than this, in all probability, the first few months of man's existence upon the globe?†

Should such proof be required, it may at once be derived from the character of the fossil flora of the earth's strata, which although now abundantly found in northern latitudes, is wholly of a *tropical form*, and consequently the temperature of those countries must undoubtedly have been much higher formerly than at present.

It is unnecessary to enlarge here upon the several means which were instrumental to this change, and enough has been said to show, that to this epoch I would refer the extinction, and imbedding in the secondary deposits of the exuvizæ now under consideration, and it therefore only remains to state, that these marine formations as they are termed, remained in the bosom of the deep until the period of the second revolution or Mosaic deluge, when the mountains in which they now occur were upraised, for the purpose of throwing back the waters from the surface of the earth into their proper beds ; to serve as agents, from their accumulations

* That is—“ by labour.”

† I am well aware, that many will object to this, that man did not exist upon the earth until long after the period here spoken of ; but I shall be able hereafter to give proof that such doctrine is not only unfounded, but actually opposed to facts.

of snow, in reducing still more the temperature of the earth, and in furnishing those supplies to the rivers and streams, which are so essential to the welfare of organised creation; and, lastly, perhaps it may be added, to stand forth with their imbedded fossils as eternal and convincing monuments of man's fall and punishment, and of the truths so simply stated in the Scriptures.

My own opinions lead me to conclude, that when the waters of the ocean had risen over, and, as in the beginning again enclosed the earth in its cold embrace, and had effected the punitory offices for which it was permitted to transgress its bound, the lofty mountain ranges which now adorn the surface of our earth were successively upheaved through the agency of *submarine* volcanic powers, forming in the depths of ocean vast indentations or depressions, corresponding in magnitude to the masses which were upheaved upon the *opposite surface*, and into which *depressions* or *vacuities*, by the laws of nature still in force, the waters would have rushed or risen, forced down as they were by the pressure of the superincumbent atmosphere, and thus as each successive upheavement took place, the waters being *drawn downwards* would have again retired from the surface of the earth, into the place appointed to receive them; the same as on that third creative day when, as recorded in the Scriptures, they were commanded "to gather themselves together, that the dry land might appear."

Nor does this theory of submarine upheavements appear to be unsupported by the opinions of able geologists, for we find in the words of Dr. Buckland, "that *trachyte* and *lava* being ejected through apertures in *granite*, prove that the source of volcanic fires is wholly unconnected with the pseudo-volcanic results of the combustion of *coal*, *bitumen*, or *sulphur*, in stratified formations, and is SEATED DEEP BENEATH THE PRIMARY ROCKS."

Among the vast mountain ranges which were then upheaved, the Himalya stands pre-eminent, and as it rose towering upwards from beneath the waters of the *deluge*, the lake in question, and doubtless many more, may have been borne on high enclosed among its loftiest ridges. If such were the case, its waters which at first were salt, would afterwards have become fresh, from the cause already stated. Or if no such lake were borne aloft, then must it have accumulated in after times from the snows above, until bursting through the barriers of *gneiss*, which had hitherto confined it, the valley would have been left nearly as we find it in the present day.

The solution of the problem must therefore be sought for in the strata and appearances which the valley now exhibits.

* For an illustration of this, see Fig. 5.

Those phenomena and appearances have already been stated, and it therefore now only remains to show, that they are precisely in accordance with the theory proposed, and prove it to be correct.

When the vast ranges of the Himalya burst upward through the watery shroud which had hitherto enclosed the earth, the lofty ridges which surrounded the lake became at once the eternal reservoirs of everlasting snows, from which numerous streams descended, as in the present day.

The waters of the lake itself were *salt*, being taken from the ocean, and they gradually yielded to the streams which descended from the heights, until they became first *brackish*, and finally *fresh*.

The largest body of water which was supplied from the snows was that of the Spiti river, and to its current are partly attributable the appearances of the present valley.

Let us then look well to the mode of operation.

The lake was *salt* or marine; its waters after the agitation caused by the upheavement had ceased became tranquil, and as their nature began immediately to undergo a change from the influx of the snow streams, a deposit from its waters commenced. That deposit I hold to be the bed of friable or earthy *gypsum*.

The reason why it occurs at the lower end of the lake is this:—The downward rush of the Spiti waters from the heights of the *Paralassa* range, caused a strong current to advance far onwards into the valley, where it became less and less rapid, till it died away, or was checked by the body of water below.

Thus we may at once perceive, that while the fresh waters usurped the upper portion of the valley, the middle and lower parts were occupied by *brackish* and *salt* waters respectively—a circumstance that may be fully understood by observing the confluence of a large river with a gulf or any part of the sea. The river is fresh, the junction *brackish*, and the ocean *salt*.

The *gypsum* or *sulphate of lime* would therefore naturally be precipitated in the greatest quantities at the lower end of the valley, where the waters were the saltiest, and the bed would gradually become thinner as it advanced into the intermediate part where the lake was brackish, and it would be wanting altogether in the upper part where the waters were fresh. This is precisely the fact, for the upper end or head of the Spiti valley is free from the *gypseous* deposit, while towards the middle we find the rocks often incrustated with it, or forming with fragments of *shale* and other rocks a *gypseous breccia*, which becomes less *crystalline* as it advances to the lower end of the district, where it yields to the thick beds or deposit of friable *gypsum*.

While this deposit was precipitating from the changing waters of the lake, the streams from the snows were bringing in large quantities of fine alluvial particles, such as *sands* and *clays*, and water-worn *stones* of various size.

These were deposited above the *gypsum* of the lower end of the valley, and passing on after that had ceased, reached to the upper end of Spiti. This too, is seen to be the fact, for the beds of *clay* are found not only covering the *gypsum* to a great depth, but also occupying its place at the upper extremity of the district.

At the same time, the waters carried onwards an uniform solution of *clays*, which they precipitated throughout the valley, the heavier *stones* and *boulders* were forming beds at the points where the streams fell into the lake. A reference to the annexed section will show the order and disposition of the various deposits which this valley contains, and serve to illustrate the foregoing remarks :—

(See plate) FIG. 8.

• *Section of the Spiti Valley.*

Let 3. 3. represent the fall or present line of descent of the river Spiti from Leedung 12,037 feet, to Chungo 9897 feet above the sea.

It will be at once apparent that the waters of the lake must have had an increasing depth towards the lower end of the district, and that they were fresh about A;—brackish about B;—and salt at C. The *gypsum* was therefore deposited at the lower end, and is represented as lying within the triangle 2. 2. 3.

At the same time, above this *marine formation* a thick stratum of alluvial deposits took place, forming a *fresh water formation* throughout the valley, as represented within 1.1. 2. 2.

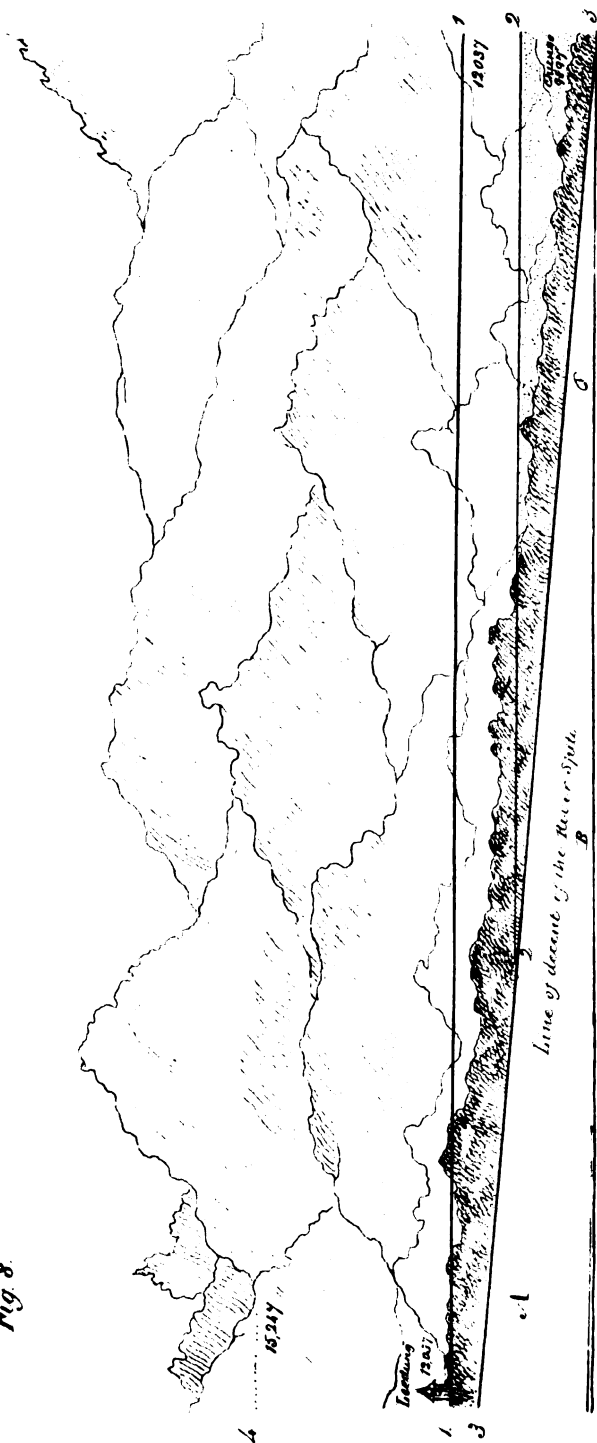
The height at 1. on the left hand is 12,037 feet at the village of Leedung, and the corresponding elevation at 1. on the right hand is the height of the aqueous deposit about Chungreezing above Chungo, which is also 12,037 feet, thus beautifully exhibiting the line of the former surface of the alluvium.

Above this the waters rose and filled the valley, till they procured egress at the lower end, beyond Leeo.

Thus from the appearance of the district we gather, that it has once been the bed of an extensive marine lake, whose waters having at length burst through their barriers, have escaped by the channel of the Sutledge.

This fact I consider to be indisputable, and it leads at once to a satisfactory explanation of the origin of the deep alluvial deposits of *clays*.

Fig. 8.



1. Former level of Alluvium consisting of Clays, Sands and Pebbles.
2. Former level of Diluvium or Marine Formation consisting of friable Gypsum.
3. Present Fall or line of level of the Spill River from Leaving 15,247 feet to Chungo 9,897 feet.
4. Leaving Pass 15,247 feet above the Sea and site of Marine eruvie

sands, and *pebbles* now seen in the lower parts of the valley of the Sutledge, to which allusion has been made in the commencement of this paper.

Having now, I trust, satisfactorily showed how the theory proposed, and the facts observable, are in accordance, it only remains, before bringing the subject to a close, to take a brief and rapid glance at the geological formations of the lower hills from Kotgurh to the foot of the mountains.

Taking that station, therefore, again as a starting point, and proceeding towards Simla, we find the formation to consist principally of *mica* and *clay slates*, the one constantly fading into the other, and occurring in frequent alternations.—*Quartz* veins are numerous interspersed in the beds of *mica*, which is sometimes of a soft and scaly nature, containing but little *quartz*,—at others hard and compact, exhibiting little trace of the *mica*.

The mountain of Huttoo, which rises near Nagkunda to the height of 10,656 feet of elevation above the sea, is composed of *mica slate* and *gneiss*, while its summit exhibits some rugged peaks of *granite* jutting upwards through the strata.

The soils which occur from Kotgurh to Simla, are formed chiefly from the decomposition of the *clay* and *mica slates*, with the addition often of a rich vegetable mould.

Descending from Simla towards Subathoo, the primitive formations again yield to the secondary series, exhibiting dark blue *limestones* and many alternations of *slate clay* of different colours; dull-greenish, yellowish, and purple. The latter is also seen as the paste or matrix of a *quartzose breccia* composed of angular fragments of *white quartz*.

Around Subathoo the change becomes the most decided, and the strata are there seen in perfection, consisting of the usual thick beds of *clays* and *marles*, varied with veins of *gypsum*, and resting on a red *marle*, apparently analogous to the red *marle* of England. The strata are here often upheaved nearly to a verticle position, and thick beds of shell *limestone** are found alternating with thinner strata of compact *limestones*, containing casts of bivalve shells, similar to the "*Venus angularis*" of the European strata. Large specimens of *Ostræ* also occur, as well as compact strata, almost entirely composed of small species of the fresh-water genera, *Melania* and *Poludina*.

The presence of these last prove again, beyond a doubt, that fresh water must have occupied eventually the basins in which the marine strata of the secondary series were deposited, and leads to the supposition, that nearly the same causes were instrumental to the formation of that series, as we have just shown to have been conducive to the deposition of the *diluvium* and *alluvium* of the Spiti valley.

* Strata composed almost entirely of shells.

Above these various alternations we find the *oolite*, with its strata of *sandstones*.

Captain P. Gerard of the Invalids, informed me that his brother, the late Dr. Gerard, had once discovered some *Ammonites* in the valley below Subathoo, but although I procured and fractured several of the dark rounded balls in which they often occur, I was not fortunate enough to meet with a specimen of the shell.

About eight miles from Subathoo, in an easterly direction, are rocks of a greyish *limestone*, rising above the *lias* and *oolitic* formation. Immediately underlying this are several strata separated by layers of flints of various forms, and imposed upon these, the *limestone* is first of all stratified and dipping in the same direction, namely, to the S. W.; but the superior portion of the beds rises in shattered and *amorphous* masses, giving a picturesque and beautiful appearance to the range. This *limestone* is quarried and used for economical purposes; it is of two kinds, one being of a pale dirty white or greyish colour, and is the stone from which the *lime* is procured, the other being darker and harder, emitting a strong sulphurous foetid smell when fractured. This latter is little used, and appears to hold the lighter coloured variety imbedded in it in large masses.

The geological position of this *limestone*, coupled with the remarkable occurrence of layers of rounded and kidney-shaped flints, leads to the supposition, that it may be analogous to the chalk formation of Europe, and if so, it will follow, that the vast ranges of the Himalya, so long supposed to exhibit strata of *gneiss* and *mica schists* alone, will be found to present formations entirely analogous to those of other mountainous countries, even from the *granite* upwards to the *alluvium*, at present in course of deposition and accumulation.

The range on which Subathoo stands, exhibits another example of the effects of what I have termed a *double upheavement*.

Seen from the dâk bungalow of Chamier, the outcrop of the *sandstone* strata is seen dipping towards the N. Eastward, while the same rocks from which they have been torn, dip on the Chamier side of the Glen, towards the S. Westward.

But the N. Easterly dip is not the true direction, for we see again on the opposite side of the same range, that the strata dip likewise to the S. W.

Therefore, the deep valley or glen between the Subathoo and Chamier ranges is the line of disruption of the strata, causing them, as it were, to dip outward on either hand.

From Subathoo downwards to the foot of the hills, the strata belong to the *lias* formation, and gradually fade away until they yield at

length to the *sandstones* of the tertiary series, in which, at various places from Nahn to Buddee, the fossil exuvise of extinct quadrupeds are found.

This, although but a faint and meagre outline of the geology of the noble ranges of the western Himalaya, is nevertheless sufficient to point out the *formations* which occur from the base of the mountains to Spiti and Ludāk, and is as much as could be done in a hasty tour over so extensive a field. I shall now, therefore, draw this somewhat lengthy paper to a close, by alluding to the means by which the imbedded exuvise of these formations have been brought to light in these latter days.

I have already stated, that the fall of man is the true period to which the loss of the fossil marine *Mollusca* of the Spiti and Subathoo fields is to be referred.

At the time of their extinction, the secondary strata in which they are imbedded were under course of deposition in horizontal beds, beneath the bosom of a tranquil water, and thus they remained for a period of many years after.

The increasing depravity of the human race, once more called down the vengeance of an offended God, and brought about the second and last grand revolution which the earth has experienced, namely, the *Mosaic deluge*.

That catastrophe was the means by which the destruction of the large terrestrial *mammalia* of the tertiary strata was effected.

When, therefore, the waters had performed the punitive offices for which they were allowed to transgress their bounds, the mountains of the Himalya were caused, among others, to rise upwards by some vast volcanic or upheaving agent, in order to throw back the ocean from the earth, and gather it again into the place appointed to receive it.

By that upheavement the primary series of the Snowy Range was thrust aloft in torn and ragged spires, while the secondary strata of Spiti and Subathoo then first rose upwards from their horizontal plane to the inclined position which they now possess. Consequent on the uprise of this secondary series was also that of the tertiary beds, and thus we find one single geological revolution to be the sole agent in upheaving the strata of three widely distinct and separate formations.

The Snowy Range or true Himalya, is composed entirely of rocks belonging to the primary series, while to the north and south of it are found resting on its sides, strata of the secondary formations disposed at high angles from the horizon, and usually rich in the exuvise of marine and lacustrine *Mollusca*; while on the southern exposure, forming the base of the hills, and resting on the secondary rocks, occur the tertiary or diluvian beds, which the successful researches of Messrs. Falconer, Durand, and others, in

the present day, have proved to be so rich in the exuvæ of the now extinct forms which once inhabited these countries. Whether this last series occurs also on the northern side, is a point for future investigation; but as fossil bones are sometimes brought down by native travellers from the Tartar hills beyond Almorah, it would seem that similar phenomena are to be expected there.

The inclined position both of the secondary and tertiary series, is clearly attributable to the outbreak of the primary rocks from beneath or through them and furnishes to the inquiring mind, a sure and beautiful guide by which the period when these vast mountain ranges first rose upwards to adorn our earth, may be satisfactorily and positively determined. The conclusion, therefore, to be drawn from the facts observable in these strata, are all strictly in accordance with the rules of geological reasoning, and I shall therefore now bring the subject to a close, by endeavouring to show the reasoning and existing facts to be in unison, and thus fix the period to which must be referred the stupendous and never-fading monuments of Almighty power, exhibited in the vast upheavements of the Himalyan range.

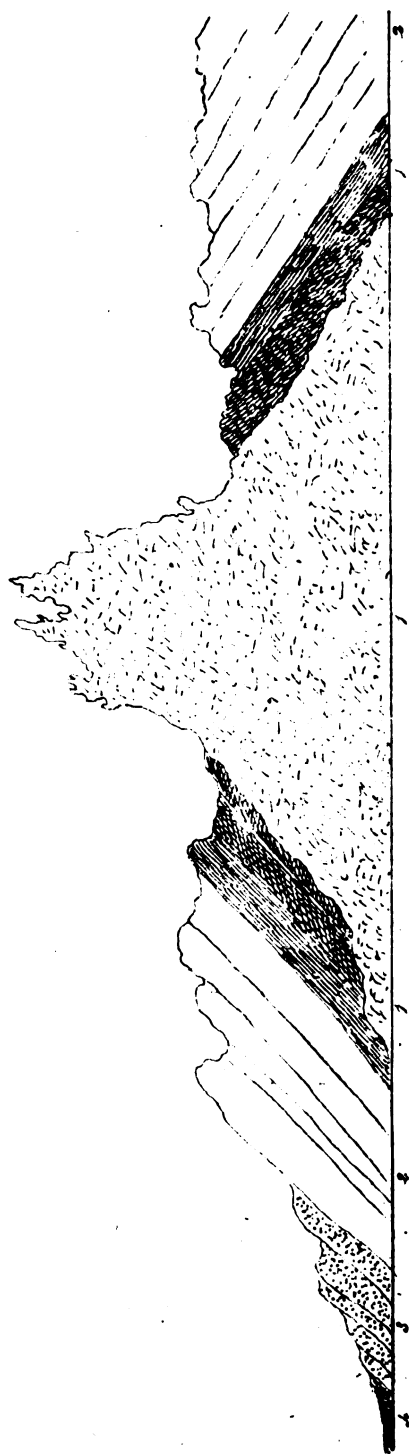
It is a fact accepted and admitted by geology as indisputable, that where one series of rocks having a horizontal position is found to rest upon another whose strata are inclined, it amounts to positive certainty, that the *deposition* of the *former* took place *subsequent* to the upheaving of the *latter*; and vice versâ, where both series are found, the one resting on the other at high angles with the horizon, that the deposition of the superior strata took place *previous* to the upheavement of those by which they are supported.

Resting on the *primary* rocks of the Snowy Range, we find on either side the strata of the *secondary* series thrown into an inclined position by the upheavement of the *granite* and its usual accompaniments of *gneiss* and *micaceous slates*, proving by their inclined position, according to the above reasoning, that they were deposited *previous* to the outburst of the former through them.

Again we perceive, that resting on the secondary rocks the tertiary or diluvial strata of the Siwalik range have also an inclined position, consequent on the upheavement of the *primary* and *secondary* series, and therefore, that they too, by a parity of reasoning, were deposited *previous* to the upheavement of the two former.

Now the *tertiary* or *diluvial strata* containing the fossil exuvæ of extinct terrestrial *Mammalia* are clearly attributable to the effects of the *last great revolution* which our earth has undergone, and consequently, we derive from the phenomena, presented to our notice in the various formations of the Himalyan mountains, sure and decided data for determining the period of

Fig. 9.



Inaugural Section of the Hamlet, showing how the inclination of the Primary Strata at 1, 2, 3, 4 would cause the inclination of the Secondary Strata at 5, 6, and the Tertiary deposits at 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100.

their first upheavement, which period the facts adduced enable us to assign to the first subsidence of the waters of the *Moasic deluge*.—(See plate) FIG. 9.)

We may suppose, therefore, that when the ocean had been permitted to transgress its bounds, and had again enveloped the earth as in the time before the third creative day, or separation of land and water ; and had by its devastating effects fulfilled to the utmost the dreadful doom assigned to all organised creation, the vast and imposing ranges of the Himalya and other mountains were caused to burst upwards by volcanic agents from below, as a means of throwing back the waters from the earth into those bounds appointed to receive them, and also to furnish, by their subsequent accumulations of everlasting snows, a never-failing reservoir from which the rivers of the plains were to be supplied with waters to fertilize the soil ; which plains, had the mountains been of inferior elevation, would for ever have remained barren and desolate, except during the prevalence of the periodical monsoon ; for it is apparent, that in the hot climates of the eastern world, no snows could have rested upon mountains of a lesser altitude sufficiently long to afford a never-failing supply of waters for irrigation.

Thus, even in the ordering of a mountain range, and the furnishing of wintery snows, is the wisdom and unvarying goodness of the Great First Cause, made manifest to the minds of his inquiring creatures.

To enter at length into the means by which these revolutions took place, and the reasons *why* they were allowed, belongs more properly to a system or theory of geology than to a paper professing to be merely an outline of the geological formations of a limited district.

I shall, therefore, for the present, leave the question in this imperfect form with less regret, since I purpose ere long, (should circumstances befriend me,) to lay before the Society and the Public a theory, which I would fain believe worthy of their most serious and attentive consideration.

CANDAHAR,
19th July, 1840.

On the two wild species of Sheep inhabiting the Himalayan region, with some brief remarks on the craniological character of Ovis, and its allies.—By B. H. HODGSON, Esq. *Resident at the Court of Nepal.*

The great paucity of unquestionably wild species of the genus *Ovis* now found throughout the habitable globe, is a fact that has been employed to cast a speculative doubt upon my announcement (Catalogue of 1832 and 1838,) of two species in the single region of the Himalaya; and the circumstance of my not having been able therefore to give as full and satisfactory an account of the second species as I long ago gave of the first, (see Journal for September, 1835,) from living specimens, has tended to confirm the above mentioned doubt. I am still unpossessed of similar valuable materials for the illustration of this second species, having never been able to procure the animal alive, nor even to obtain a perfect suite of the spoils of a grown male. I have horns, however, of the mature ram, and skulls and skins of others, varying from one to two years in age; and from these, not inadequate materials, I purpose now to furnish a specific character of the Ammon-like, as well as (for the sake of comparison,) of the Musmon-like animal, together with craniological sketches and details relative to both; such as will suffice, I hope, to place beyond further question, the existence of two entirely distinct, new, and peculiar breeds of Sheep in a state of nature in the Himalaya; where indeed, from the unparalleled elevation and extent of the mountains, it need be no rational matter of surprise that they exist.

Ovis Ammonoides, Nob.—Large wild sheep, with massive strictly trigonal sub-compressed horns, deeper than broad at the base, presenting a flat surface vertically to the front, and cultrated edge beneath, inserted not in contact on the crest of the frontals, remote from the orbits, directed backwards and outwards with a bold circular sweep: the flattened points being again subrecurved outwards and the whole surface covered with numerous heavy complete wrinkles: the forehead flat and broad: the nose scarcely arched, and much attenuated to a fine small muzzle: the ears short, pointed, and striated: the tail short and deer-like, and the limbs fine and elevated: the vesture composed of close, thick, more or less porrect, brittle piles of medial uniform length, concealing a scanty fleece: no beard nor mane: general colour dull slaty

blue, paled on the surface, and more or less tinted with rufous : dorsal ridge dark and embrowned : lips, chin, belly, and insides of limbs near it, dull hoary : limbs externally, below the central flexures, rufescent hoary : snout to base of tail seventy to seventy-two inches : mean height forty-two : head straight to crest of frontals, fourteen : tail with the hair, eight : ears, six : horns, along the curve, forty.

Females smaller, with much smaller, compressed (?) nearly straight horns. Young, with the colours deeper and more sordid. Vulgo, *Banbhéra* and *Bhadrāl*.

Ovis Nāhoṛ, *Nob*. Medial sized wild Sheep, with moderate, subtrigonal, uncompressed horns, presenting a rounded surface obliquely to the front, and a cultrated edge to the rear, inserted nearly in contact on the crest of the frontals, less remote from the orbits, and directed upwards and outwards with a semicircular sweep ; the rounded points being again recurved backwards and inwards, and the general surface vaguely marked with infrequent rugæ : forehead broad and flat : chaffron arched : muzzle less attenuated : ears erect, short, and striated, and tail short and deer-like, as in the last : vesture or fur also similar, without beard or mane : general colour dull slaty blue, paled on the surface, and more or less tinted there with brownish or fawn : head below, and belly and insides of the limbs near it, yellowish white : face, or nose rather, fronts of the intire limbs, a connecting band along the flanks, whole chest and tip of the tail, black : no disk on the buttocks : their mere margin and that of the tail, paled. Snout to rump sixty inches : mean height thirty-six : head, as before, eleven : tail with the hair seven and three quarters : ears five and three quarters : horns along the curve, twenty-four. Females smaller, with small straightish, suberect, depressed horns, directed upwards chiefly, and with the dark marks on the limbs and chest less extended than in the male ; frequently the chest is wholly unmarked. Young, with the colours deeper and more sordid ; the marks still less extended, and wanting wholly on the chest and flanks. Vulgo *Nāhoṛ* of the Nepalese.

N. B. Since the Prince of Musignano has published his account of the *Musmon*, it has become quite evident that our *Nāhoṛ* cannot be identified with that species ; and though the vaguer accounts of the Asiatic Argali render a like confident judgment in regard to the independence thereon of *Ammonoides* difficult of attainment, yet all

appearances warrant that conclusion. I proceed now to the osteology.

Dimensions of skulls and horns of (1) *Ammonoïdes junior*, (with horns of senior,); and (2) of *Nāhoör*.

horns of senior,); and (2) of <i>Nāhoōr</i> .		I.		II.			
		<i>Ft. In.</i>		<i>Ft. In.</i>			
<i>Skull.</i>	Length from symp. intermax to crest frontals, }	1	1½	0	10½		
	Greatest height at the crest,...	0	9¼	0	6¼		
	Greatest width between ex- ternal margin of orbits, ... }	0	7¼	0	5¼		
	Diameter of orbits,	0	2½	0	1½ ⁹ / ₁₆		
	Symp intermax to tips of nasals,	0	3½ ¹ / ₁₆	0	2½ ³ / ₁₆		
	Length of nasals,	0	6	0	4		
	Height or length of occiput to lower edge of great condyles, }	0	0	0	4¾		
<i>Horns.</i>	Length of, along the curve,...	1	10	3	3	1	11
	Basal circuit of,	1	1½	1	3¼	0	10¾
	Basal depth of,	0	4¾	0	5⅞	0	3½
	Basal width of (across,) ...	0	3½	0	3½	0	3½
	Terminal interval of,	1	9	1	8	1	9¼
	Basal interval of,	0	0¾	0	0¾	0	0¾
	Weight,	7lbs.		20lbs.		7½lbs.	

The above are males, of which the *Nāhoör* is old, and *Ammonoïdes* about eighteen months to two years; but the second pair of the horns given are those of an old male.

The skulls of both have the same general character, possessing alike large flat foreheads, with the frontals half-developed on the postcal plane of the skull, which falls perpendicularly, and nearly at right angles from the antecal plane, whereon the frontals have an extreme breadth exceeding their length by one-third almost. The skulls of both alike have, moreover, the nasals somewhat arched; and half the antecal extent, with all the postcal, of the frontals is bounded by the broad proximate bases of the horns, which, however, extend over the true occiput in neither. The differences observable in the skulls are chiefly, that the orbits are more salient in the *Nāhoör*, and have no semblance before them on the lacrymal and malar bones of that roundish depression which in deer and antelopes holds the cuticular suborbital sinus:

whereas before the less salient orbits of the *Bhārāl*, that depression is palpably marked. Less marked discrepancies between the skulls are found in the greater arch of the nasals in the *Nāhoör*; the more complete concealment of the frontals superiorly and anteriorly by the bases of the horns; and the greater attenuation forwards of the maxillary and intermaxillary bones. In the horns the distinctions between the two species are very palpable; those of the *Banbhéra* being more massive, strictly trigonal, with a flat surface forwards, far more heavily wrinkled, and much more completely curved towards a circle, whence it results that the bases are thrown more off the forehead, and that the direction at first is parallel to the plane of the face. In the *Nāhoör*, on the other hand, the horns though ample, are neither as massive nor as long as in the *Banbhéra*. So far from being a perfect trigonal, the anterior half of them almost is broadly convexed: their surface is very much smoother; their divergency greater; their bend towards the circle far less complete, and consequently their bases lie more over the forehead, and they have for some way upwards, a direction much before the plane of the face. In the *Nāhoör*, the horns towards their tips are rounded or cylindrical, and are decidedly reverted out of the line of the first curve, backwards and inwards. In the other species, or *Bhārāl*, the characteristics of the horns in these respects are compression to flatness, and a less decided retroversion of the extremities, leaving the actual points directed forwards and outwards.

I shall conclude this paper with a general remark, which is, that the great depth or extent of the postcal plane of the skull, (comprehending half the frontal and all the parietal bones,) and the acute angle it forms with the antecal plane* in the genus *Ovis*, will be found to be characters of more permanency and moment in separating this genus and *Capra* from the nearest adjacent groups of Ruminants, than most of the diagnostics now employed; and that we have Cuvier's example in regard to the Bovine group to authorise our adoption of the additional and so much required mark as now suggested for the Caprine or rather Ovine. I subjoin an outline of the typical Antelopine and Cervine form of skull on one hand, and that of the normal form in *Ovis* and *Capra* on the other; and those only who would reject an essential part of

* The consequences of these peculiarities in the low position of the condyles of the lower jaw, and of the foramen magnum, are also marked.

the now generally recognised diagnostics of the groups of the *Bovidae*, (Taurus, Bubalus, &c.) or who are ignorant of the shadowy nature of the existing marks of discrimination between Antelope, Ovis, and Capra, will, I apprehend, refuse to adopt the now suggested more enlarged application of Cuvier's principles. Either those principles are false, or this larger application of them is as legitimate as it is requisite. On these principles, (as on others,) *Cervus* and *Ovis* represent the extremes, and *Antelopa* and *Capra* the means: but there is a regular graduation from *Cervus* to *Antelopa*, from it to *Capra*, and from it again to *Ovis*; in such wise, however, that the two former fall naturally into one great group, and the two latter into another, *Cervus* and *Ovis* being the typical forms. And I may add as a proof how useful the new diagnosis now proposed is, and how harmonious in practice with other and admitted criteria, that, measured by this standard, our *Hemitragus* (the *Jharal*) is as clearly a caprine form as Ogilvy's *Kemas* (the *Ghoral*) is an antelopine one. Thus too the affinity of the Musks and Muntjacs to *Cervus*, however apparently anomalous they seem to be, is rendered palpably evident, and the soundness of our diagnosis consequently further corroborated.

With regard to *Ovis* and *Capra*, inter-se, Cuvier's 'forehead concave' for the latter, and 'forehead convex' for the former genus, are clearly erroneous marks; but those sometime since suggested by me, of 'males odorous,' and 'males not odorous,' as respectively characteristic of *Capra* and *Ovis*, I find confirmed by every day's experience: nor is this discriminative sign dependent, as supposed, on season in any degree, nor even on age after the animal has reached about four months, so soon is the odour developed in *Capra*.

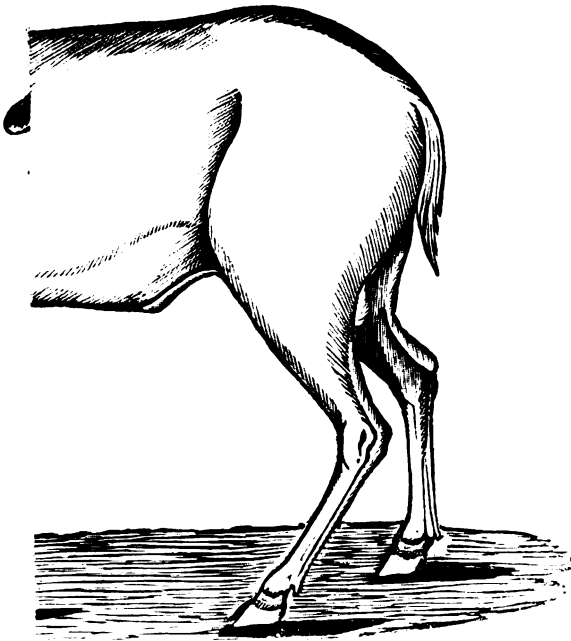
Nipal, March, 1841.

H. B. HODGSON.

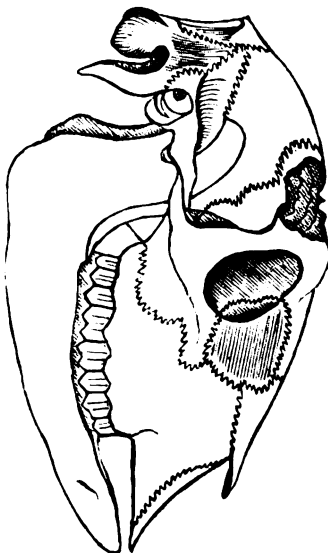
Explanation of the Illustrations.

- I.—1. 2. Front view of the horns and skulls of our two species of Sheep, to prove their distinctness.
- II.—Sketch of *Ovis Nahoar*.
- III.—Lateral outline view of two skulls, designed to exhibit the characteristic form in *Cervus* and *Antelope* (1) on the one hand, and in *Ovis* and *Capra* (2) on the other: and I may add, that the animals having been females, and not specially selected, the distinction contended for is thus shown to be peculiarly valid.

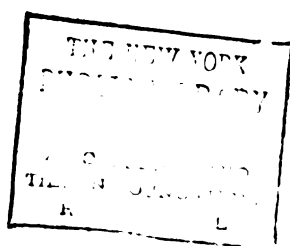
ate II.



III.



I



On the Laws and Law-books of the Armenians. By JOHANNES
AVDALL, Esq., M. A. S. &c.

[This paper, Mr. Avdall informs me, was drawn up at the instance of Mr. J. C. C. Sutherland, who having referred to the author for information on the recognized sources of Armenian law, was answered by the production of this erudite paper. It contains a very clear exposition of a subject wholly unknown to general students, and móoting points of historical as well as legal interest.]



An account of the first enactment of laws, instituted in Armenia, by the Armenian king Valarsaces, a descendant of the Arsacidæ, is recorded in the historical work of Moses Chorenensis, a Latin translation of which, with the Armenian text, was published at London, in the year 1735, by the two brothers, William and George Whiston. This Armenian historian, of venerable antiquity, enumerates in a successive and proper order, the rules and regulations enacted by Valarsaces, both for the guidance of the inmates of the royal palace, and of the citizens in general. “ Եւ օրէնս իմն հաստատէ ՚ի տան թա-

գաւորութեան իւրոյ . և ժամս որոշէ ելլմտից և խորհրդոց և խրախճանութեանց և զբօսանաց . . . Հրաման տայ քաղաքացեաց մարդկան արգոյ և պատիւ լինել քան զգեղջկաց, և գեղջկաց պատուել զքաղաքացիս որպէս զիշխանս . և քաղաքացեացն փ' կարի առ գեղջկօքն պերճանալ, այլ եղբայրաբար վարիլ վասն բարեկարգութեան և աննախանձոտ կենաց, որ է շինութեան և խաղաղութեան և կենաց պատճառք, և որ ինչ նման այսոցիկ : ~ Թ.

7. “ Legésque quasdam de aulâ suâ posuit, quibus exeundi et intrandi, consiliorum, et epularum atque oblectamentarum tempora distribuit. Ampliorem dignitatem atque honorem civibus, quàm rusticis haberi jubet; Rusticiis, ut cives, tanquam principes, colant, imperat; Civibus, ne se erga rusticos superbè gerant, sed fraternam inter se vitam degant, honestè institutam, et ab invidiâ remotam, unde tranquillitas vitæ et securitas, aliâque ejusdem generis sint oritura.” *Lib. II. Cap. VII.*—From the foregoing facts it is evident that Valarsaces had

given a code of laws for the guidance of the Armenians. To have orally delivered these laws, without committing them to writing, was certainly unbecoming the enlightened and civilised reign of Valarsaces. But, of all the laws enacted by this king, one is repeatedly quoted by Moses of Chorene, which shall be mentioned below.

Laws enacted during the reign of the Arsacidæ, first by Valarsaces the Parthian, and afterwards by others.

In the foregoing chapter Moses Chorenensis writes thus about Valarsaces :—“**Եւ քանզի բազում ունէր ուստերս , պատշաճ վարկաւ ոչ ամենեցուն առ իւր կալ ՚ի Մըծ-բին (ուր բնակէր յայնժամ ինքն Վաղարշակ .) վասն որոյ առաքէ զնոսա բնակել ՚ի կողմանս Հաշտենից , և ՚ի ձորն նորին սահմանեալ , որ է արտաքոյ Տարօնոյ . ՚ի նոսա [Թողլով զէնս ամենայն հանդերձ յաւելուածով մօից առանձինն , և ռոճկաց կարգելոց յարքունուստ , և միայն զառաքին որդին՝ որ կոչէր Արշակ , պահէ առ իւր ՚ի համար Թագաւորութեան : Եւ եղև այս յայնմ հետէ և առ յապայ օրէնք ՚ի մէջ Արշակունեաց , միոյ որդւոյ բնակել ընդ արքայի , փոխանորդ լինել Թագաւորութեանն . և այլ ուստերաց և դստերաց գնալ ՚ի կողմանս Հաշտենից՝ յազգին ժառանգութիւն :**”

“Caeterùm quum multos filios haberet, parum utile esse ratus, ut cuncti ad Nisibim manerent, in provinciam eos Hastensem dimisit, et ad Zoram, quae fines ejus contingit, trans Taronem sitam; illisque universa ea oppida attribuit et stipendia insuper de gazâ regiâ singulis statuit; at ex filiis suis, natu solùm maximum, Arsaces ei nomen erat, imperio destinatum. Deinceps inde consuetudo Arsacidarum fuit, ut unus de filiis cum rege habitaret, regni successor futurus, cæterique filii ac filiae in regionem Hastensem ad possessiones suas abirent.” Artavazd the First, moreover, conferred on the Armenian princes, possession of the provinces of Aliovit and Arberany.

“ Սա Ժառանգեցուցանէ զեղբարս իւր և զքորս ՚ի գաւառս Աղիովտի և Առբերանոյ , Թողլով ՚ի նոսա զմասն արքունի՝ որ ՚ի շէնս այնմ գաւառաց , հանդերձ առանձին մտից և ռոճկաց , ըստ օրինակի ազգականացն՝ որ ՚ի կողմանս Հաշտենից . որպէս զի լինել նոցա պատուականագոյն և առաւել Թագաւորազնն քան զայնս Արշակունիս . միայն օրինադրէ՝ ոչ կեալ յԱյրարատ ՚ի բնակութիւն արքայի : ” Դ .

21. “ Is fratribus suis ac sororibus possessiones in provinciis Aluhotensi et Arberanensi dedit, regemque eis vectigal attribuit, quod ex provinciae ejus oppidis redibat, propriumque ipsis stipendium insuper statuit, de more cognatorum, qui in regione Hastensi habitabant, ut honoratiores essent, atque adeo ad regem dignitatem propius accederent quam Arsacidae caeteri ; lege tantum sanxit, ne Araratam, quae erat regia habitatio, incolerent.”—*Lib. II. Cap. XXI.*—Sánátrúk also sent the daughters of Abgarus to that part of the country, about which Moses of Chorene says:—“ Զամենայն զաւակ տանն

Արգարու մաշեաց սրով բաց յաղջկանց , զորս եհան ՚ի քաղաքէն (Եդեսիոյ) բնակել ՚ի կողմանս Հաշտենից : ” Դ .

32. “ Sed omnem Abgari stirpem, praeter puellas, ferro sustulit, quas, ex oppido eductas, in provinciâ Hasteniâ collocavit.” *Lib. II. Cap. XXXII.*—Following this example, Artavazd the Second, sent the other princes to those provinces. “ Հալածէ յԱյրարատոյ զամենայն եղբարս իւր ՚ի գաւառս Աղիովտայ և Առբերանոյ , զի մի՛ բնակեսցեն յԱյրարատ ՚ի կալուածս արքայի , բայց միայն զՏիրան (զեղբայր իւր) պահէ փոխանորդ իւր . զի որդի ոչ գոյր նք : ” Դ .

58. “ Artavazdes omnes fratres suos ab Araratâ in Aluotam et Arberaniam provincias pepulit, ut ne Araratam ac possessiones regias incolerent. Tiranum modò secum retinuit, regni successorem, cum sibi non esset filius.” *Lib. II. Cap. LVIII.*—The royal descendants having permanently settled in these parts of the country, began to

increase and multiply, and after the lapse of several years, the number of their offspring became very considerable, so much so, that an appeal was made by them to Tiran the First, touching the insufficiency of the provinces allotted for their habitation, to contain such an increased and increasing number of inhabitants. Moses of Chorene says:

“Եւ եկեալ առ նա կանխագոյն իւրոյ ազգին Արշակունեաց որ էին ՚ի կողմանս Հաշտենից, ասեն. ընդարձակեա՛ն մեզ զԺառանգութիւնս զի նեղ է, քանզի բազմացաք. և նա հրամայէ ոմանց ՚ի նոցանէ երթալ ՚ի գաւառն Աղիովտի և Առբերանոյ. իսկ սոցա առաւել ևս բողոք կալեալ առ արքայի, թէ առաւելագոյն նեղ է մեզ, ոչինչ ունկնդիր լինի Տիրան, այլ հաստատեալ վճիռ՝ ոչ այլ ժառանգութեալ նոցա, բայց զոր ունին հաւասար տրոհել յինքեանս. զոր բաժանեալ ըստ մարդաթուի՝ գաւապակաս ժառանգութիւն բնակողացն Հաշտենից. վասն որոյ բազումք ՚ի նոցանէ եկեալ ՚ի գաւառն Աղիովտի և Առբերանոյ:” Դ. 59.

“Caeterùm brevi tempore interjecto ad eum gens sua Arsacidarum venit, quae Hastenios tractus havitavit, dicens, “profer nobis haereditatis fines, quae arctae sunt, cùm simus admodum multiplicati.” Ille verò eorum nonnullos in Aluotam et Arberaniam provincias migrare jussit; cùmque ii ad regem acriùs clamarent, regionem eam ipsos nimis coarctare, Tiranus, nihil annuens, Edicto sanxit daturum se eis haereditatem aliam nullam; quam tenebant, aequaliter inter se dividerent. Quam cum pro hominum numero partiti essent, incolis minimè sufficere Hastenia reperta est, ac propterea multi eorum in provincias Aluotam et Arberaniam commigrârunt.” *Lib. II. Cap. LIX.*—Immediately after the death of Khosrow the Great, when Ardashir, king of Persia, made an aggression on Armenia and conquered the country, he extended his royal munificence and support to these descendants of the Armenian kings. For the said venerated historian says: “Իսկ Արտաշրի գեղեցկապէս յարդարեալ զաշխարհս

Հայոց՝ ի կարգ առաջին հաստատէր, նա և զԱրշակունիսն (զարքայորդիսն) զմեկուսացեալսն ի Թագէն և յԱրարատն բնակելոյ՝ կարգէ ի նոյն տեղիս միւլք և ռոճկօք որպէս էինն :” Դ. 74. Tum Artasires

Armeniae terram egregiè ornavit, atque in antiquum statum restituit. Arsacidas ab regno et domicilio Araratensi pulsos, in eundem locum reduxit, et eadem eis, quae priùs habuerant, stipendia statuit.” *Lib.*

II. *Cap.* LXXIV.

Of the Satraps of Armenia.

History also tells us, that there were specific laws extant for the guidance of the Satraps of Armenia. Faustus of Byzantium, who wrote an Armenian history in the fourth century, alludes to the existence of certain laws, which seem to have obtained in Armenia only during the reign of Khosrow the Little. “Posterior to this,” says Faustus, “the Persians were incessant in waging wars with the king Khosrow. Laws were, in consequence, enacted by the king for the guidance of the Armenian satraps, grandes, chiefs, and lords, whose number was very considerable, and on whom it was made obligatory to remain near to their royal master, and none of them were permitted to accompany the expedition against the king of Persia. This measure was adopted by Khosrow, from a want of confidence in the sincerity of the attachment of the nobles of his court. The terror of the disloyalty of Databi had seized upon his mind, and he apprehended the occurrence of a similar event in his own country.” *Faustus. Lib.* III. *Cap.* VIII.

Laws enacted during the reign of the Bagratidæ.

Of the laws enacted during the days of the Bagratian kings, no record has been preserved in the annals of the Armenian historians. But, from ancient Armenian manuscripts, found at Lemberg or Leopold, a city in Poland, it is ascertained that the Armenians, who emigrated in the eleventh century from the thickly populated city of Ani,* and other provinces of Armenia to that part of Europe, had carried with them the code of laws by which they were guided in their own

* Ani was a most magnificent and populous city in Armenia towards the close of the tenth century, and contained one thousand and one churches ! See my History of Armenia, vol. II. p. 92. It is nothing now, but a heap of ruins.

country. This code of laws was translated into Latin in the year 1548, by order of Sigismund the First, king of Poland. It is greatly to be regretted that not a single copy of this Latin translation of the Armenian code of laws has made its way to British India. It is, however, consolatory to learn, that this translation is to this day preserved in the library of the Armenian College at Venice. Sigismund writes thus in the preface to that code of laws: "Although we have to this day sheltered and protected the Polish Armenians, our subjects, under their own Armenian privileges and laws, by which our predecessors had acknowledged and governed them, but on the occurrence of dissensions and disputes between them and the citizens, it was thought necessary to have that law-book of theirs, which was written in the Armenian language, and which was only understood by themselves, translated by them into Latin, and presented to us in that form, so that every cause of suspicion and collusion should be removed, and that we should, by the help of the members of our council, make judicious inquiries into its contents, and, by a slight alteration, confirm the same." After writing thus far, he mentions the name of Johannes, the Bagratian king, and cites his mandate in the following manner: "Johannes, by the grace of God, king of Armenia, during the days of his auspicious reign enjoined, not to open courts of judicature on Sundays—not to borrow money—not to prefer claims against debtors; and made other similar enactments for the observance of Sundays." After this he adds: "It is enjoined by the Armenian king Theodosius, (perhaps Ashot,) of happy and blessed memory, and other orthodox Armenian kings and princes, to render justice and equity to all—to cities, towns, villages," *et hoc genus omne*. These quotations are corroborative of the existence of laws and law-books in Armenia, during the reign of the Bagratidæ.

Of the succession of Kings.

Although after the subversion of the kingdom of the Bagratidæ, we meet with a specimen of the law of succession in the commencement of the code of Mechithar Ghosh,* yet it is evident that this law was in

* Mechithar Ghosh flourished in Armenia towards the close of the twelfth, and the beginning of the thirteenth century. Besides his code of laws, he is known to be the author of several other valuable works in the Armenian language. *Ghosh* is the cor-

force in Armenia during the reign of the Bagratian kings, with some slight variations. In the days of the Arsacidæ the crown devolved from son to son in a lineal succession; but the law of the Bagratidæ confers the right of succession upon brothers. There are also some other laws, of which I shall furnish the reader with an extract: "Although," says this legislator, "the crown by right devolves upon the first-born, yet the most eminent for his wisdom is to succeed to the throne. So long as the king's brothers survive him, his sons are debarred from a succession to the throne. But, on the extinction or demise of the brothers, then the crown devolves upon the king's sons. Should the king leave a daughter surviving him, she is to be invested with the title of nobility, and is, together with her husband, entitled to one-half of a share of a brother. And, on the demise of kings, if there be a son from the son, and a son from the daughter, the son's son is to succeed to the throne, but not the daughter's. And so long as there may be descendants of the son, the daughter's children are debarred from succession, at which any attempt made by the latter is unlawful and unjust. For, it was in this manner that our king Abgarus enacted laws for the succession to the throne of Persia. And the patriarch Noah apportioned to the sons and the daughter, the regions of the southward, as women also rule over those parts."—Then the legislator describes the manner in which the succession is to descend when there be only a daughter, but no son surviving the king. Or, if there be no heir to the king, then the right of succession devolves on his kinsmen, one of whom only is to reside at the royal palace near the king, and the rest are to be domiciled at a distance, according to the custom prevalent among the former kings of Armenia. All this is written by Mechithar Ghosh, in the commencement of the second chapter of his code of laws. By the last quotation, the legislator means to allude to that usage of the kings of the Arsacidæ, of which mention was made above. The law of succession was not, however, kept inviolate during the reign of the Bagratidæ, among whom there were

ruption of the Persian word *کوسه* corresponding with *քարձ* or *քարց* or vulgò *քարակ* in Armenian. This appellative cognomen was added to the Christian name of the Armenian legislator, in consequence of his having very little or no beard. By this distinguishing appellation he is invariably mentioned throughout the works of his cotemporaneous writers, and in the page of our national history.

found some pretenders and upstarts, who created disturbances by disputing the right of succession. The collision of Atshot with his brother Johannes, is a remarkable instance of this dispute.* But, during the reign of the Arsacidæ, the whole of the royal descendants, with the exception of Sánátrúk, adhered to this law of succession.

Some other items of the Laws of the Bagratidæ.

Taxes are alluded to in the second chapter of the code of Mechithar Ghosh, who treats of the royal courts of judicature, and of those subordinate thereto: "Kings and princes," says this legislator, "ought justly to impose taxes on lands and nations, and not to exact more than what is tolerated or allowed by immemorial usages. They will have to render an account of their stewardship to the great God. They were appointed for the preservation and welfare of the country, but not to entail ruin and misery upon the people placed under their government. The imposition of taxes ought to be in the following manner: one-fifth of the produce of cultivated lands is to be given to the state. Lands, gardens, and orchards, purchased by the people, are not to be subjected to this tribute. Watermills and houses are in like manner to enjoy this exemption. The inhabitants are to be taxed for the trade in which they are respectively engaged, and the commodities which they offer for sale. Christians are considered exempt from a poll tax, which is only to be imposed upon unbelievers. Irrigated lands are subjected to a tribute of one-fifth of their produce, and affranchised or quit lands are subject to the payment of tithes. Because the right of kings and princes extends only to earth, but not to water, affranchised lands, orchards, and gardens, are also exempt from taxation. In like manner, of the seven days in the week, one is to be devoted to the royal service. To demand from labourers more than this, is a great injustice. No specific tax is to be imposed upon oxen, besides that of one-fifth alluded to above. A pound of butter is only to be levied upon each cow. Pasture-grounds are exempt from the tax which is imposed upon cattle that graze therein. The sheep are to be tithed in their lambkins, which can be exchanged with the sheep *ad libitum*. Horses, mules, and asses, are not to be taxed, because by the

* Vide my History of Armenia, vol. 11. p. 109.

help of these animals essential services are rendered to the government of the country."

From the same chapter of the code of Mechithar Ghosh, we shall quote what relates to the administration and law of precedence of the ancients. "It is unjust in princes to impose a tax upon believers, because the unbelievers are alone to be taxed. It is proper to exact tribute from the latter, but not from the former, as it is done by the Georgians to those placed under their subjection. When a tract of land is granted by the crown to an Armenian nobleman,—if a fort be raised on it by the latter in accordance with the royal consent, or if a village be constructed thereon, or if ruined buildings be repaired thereon,—then, and in that case, the same tract of land is to devolve on him and his heirs in perpetuity. The land so granted is by no means to be alienated from him without a very serious and heinous offence. And, after the death of the person or persons on whom that land is conferred, the gift is to devolve on his, her, or their, descendants by order of the king. In like manner, nobles are to be next to princes, according to the seniority or priority of the latter, and citizens and peasants ought to be subordinate to nobles.—Forests cleared, and ruined places repaired or rebuilt, are to be the undisputed and inalienable property of the enterprising persons at whose expense the works were performed, and are to devolve on their children in perpetuity after their death. On the construction of a city or fort, should there be a deficiency of money in the public treasury, it is incumbent on the people to render their general support towards the completion of the building. Citizens are to enjoy the honor of precedence to villagers, and inhabitants of villages should precede in rank the farmers and husbandmen. This law of precedence is, in like manner, to obtain among the denizens of forts and villages. These have been the usual and invariable practices among the ancient kings of Armenia." The concluding portion of this quotation alludes to the usages prevalent in our country during the reign of Valarsaces, as stated above.

Courts of Judicature, and Codes of Laws in Armenia.

In our national history mention is made of the institution of courts of judicature by Valarsaces, during the days of the Arsacidæ, as it appears from the testimony of Moses of Chorene, while speaking of the

public acts of this monarch. “**Իրաւարարս ՚ի տան արքունի,**

իրաւարարս ՚ի քաղաքս և յաւանս : Դ. 7:

“*Judices in aulâ regiâ, judices in oppidiis villisque statuit.*” *Lib.*

II. Cap. VII. Where there are judges, there must of necessity be courts of judicature, in which judges and arbiters hear causes, and administer justice by the employment of officers and subordinates, without whom judicial affairs cannot be properly managed and conducted. But, that there were actually courts of judicature in existence in Armenia, we have conclusive and satisfactory evidence in the work of that ancient historian. **Գիւղից և գաւառաց, ևս և իւրաքանչիւր տանց առանձնականութեց, և հանուրց հակառակութեանց և դաշանց, այժմ առ մեզ գտանին անբաւ զըրուցաց մատենք, մանաւանդ որ ՚ի սեպհական ազատութեն (նախարարութեն) պայտազատուի :** Թ. 2:

“*Quibus adhuc devicis at provinciis, atque etiam rebus sigillatim domesticis, publicisque controversiis, ac fœderibus, scripta extant apud nos innumera historiarum volumina, ac præcipuè dum successio mansit libera.*” *Lib. I. Cap. II.* It is evident that such codes of laws and instruments regarding which disputes and differences might have naturally arisen, by the lapse of several years, among heirs, coheirs, and legatees, were carefully kept in courts of judicature, conformably to the order of the government of the country. This has been the common and invariable practice of civilized nations, in all ages and in all countries.

We have also incontrovertible proofs of the existence of law-books in Armenia during the reign of the Bagratidæ, in the Latin translation of the code compiled and prepared under the auspices of the Armenian king, Johannes the Bagratiar, of which mention was made above. The classification of the chapters of this code is preceded by this sentence :—“ The Armenian kings lay down this model of justice for the guidance of their judges.”—Then follow, in separate chapters, laws respecting the adjustment of disputes arising from wills—laws enacted for the settlement of differences among married parties—and laws intended for the correction of offenders and the punishment of criminals.

In the face of all these evidences, one cannot but be greatly astonished in reading the introduction to the code of Mechithar Ghosh, where-