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package even to gratify the curiosity of many who wished to put their eyes on its contents.

General VENTURA'S simple request is characteristic: "Je m'empresse de vous expedier mon fameux Manekiala, que vous desirez pour envoyer à M. PRINSEP: veuillez je vous prie, mon bon ami, vous servir de cette occasion pour faire agréer mes sentimens d'estime à M. PRINSEP, et de le prier en même tems de m'envoyer une description écrite en Français de ce qu'il pourra dechiffrer des inscriptions, et empreintes de ma trouvaille."

The package has just now reached Calcutta under charge of our associate Sir JEREMIAH BRYANT.

I hasten to make known its curious contents to the Society, confining myself on the present occasion to a description of the several articles in the order of their discovery, of which we have a full account in the "Etat des travaux," published by Mr. WILSON, as already noticed, in the As. Res. vol. xvii., page 601:—The articles, being separately and carefully packed, left no difficulty in recognizing them from the circumstances there indicated.

#### *Description of General Ventura's operations.*

The excavation was commenced on the 27th April, 1830, at the very bottom of the cupola on the south side, where having met with nothing but loose materials, the work was of necessity discontinued.

On the 28th April, the cap of the cupola was laid open, and there at the depth of three feet, six medals (or coins) were discovered.

On the 1st May, at the depth of twelve feet, a square mass of masonry was found, exactly in the centre of the mound, and regularly built of quarried stones, in very good preservation. On piercing ten feet into this, a medal was found in the middle of a clod of earth.

On the 6th, a silver coin and six copper coins were met with at the depth of twenty feet.

I am not able to recognize the coins discovered up to this period, and I conclude they have been mixed with the general heap of scattered coins, all being of the same nature.

On the 8th May, the workmen came upon a box of iron (probably copper) which was broken by a stroke of the pick-axe. There was in this box a second smaller box of pure gold, (*fig. 1*, Plate *xxi.*) with an ornamental top, in the centre of which is inserted a stone resembling the opal but friable and adhesive to the tongue like *tábasheer*; it is reserved for future examination: this box contained the following articles: *Fig. 2.* One medal of gold, weighing 122 grs., or two drachmæ (the same as was depicted from a sealing-wax impression, in the As. Res. vol. xvii. as No. 1. of Mr. WILSON'S plate.)

**Obverse.** There is also a description of this coin in the Journal, ii. 38, but both that and the drawing (Pl. ii. Fig. 18) are imperfect, when compared with the real coin, of which I have now endeavoured to give an exact etching. The sceptre held by the king on the obverse has a knob like an ear of wheat. The projection behind the cap is a double fillet or ribband, and not hair: the side-flap on the contrary has more the appearance of hair, and the mustaches are well defined: the left hand holds a hook or key, or it may be a small sickle, with which the ear of corn has been cut? the legend, if Greek, is considerably corrupted (see vol. ii. p. 38), but the central part .. ANOPA.. may be traced on many of the copper coins.

**Reverse.** The seated figure on this side appears at first sight to have four arms: but on closer inspection, what was taken for one right arm may be a sword belt, and the up-lifted left arm may represent the curved part of a bow; the resemblance to wrist bangles and hands however is strong. The half moon behind the shoulders seems to prove the figure to be a sacred or symbolical personage, although the chair is a Grecian fauteuil, and the head-dress resembles a close helmet. The epigraphe on this side can hardly be other than MANAOBA... ΓΟ: the first may be connected with the name of the sacred personage, or the locality; the last two letters may be the date, 73, of some unknown era.

**Fig. 3.** A gold ring, set with a pale sapphire stone, having characters engraven upon it, apparently Pehlevi, (*fig. 3, a.*)

**Fig. 4.** A small bit of pale ruby, (Balas or Balakshani ruby, see vol. i. 358.)

**Figs. 5, 6, 7.** Three very small silver coins.

**Fig. 8.** A thin silver Sassanian coin, similar to those so frequently met with in Persia; weight 60 grs. or 1 drachma.

**Obverse.** The king's head, bearded, and having flowing curled hair: the cap peculiar for its central ornament of feathers, which somewhat resembles the Egyptian symbol of two wings supporting (in this case) a half moon, and star. The characters are Pehlevi and illegible.

**Reverse.** A rudely executed fire altar and two priests or supporters.

**Figs. 9 and 10.** Two silver coins, resembling the Sassanian piece in thinness and general character, but destitute of the fire altar; weight about 50 grains each.

**Obverse.** A beardless head, with well marked Indian features: the head-dress has a kind of tirsúl in the centre, and two flowing ribbands. A name very plainly written on the field in an unknown character. The whole is encircled with an inscription at once recognized to be in Sanscrit characters; these have been also engraved under the coins, to shew the coincidence of the two inscriptions, one of which will materially assist the decyphering of the other\*.

**Reverse.** Head of a female, front face, with very singular headdress: necklace and rows of pearls on the boddice: legend in the ancient Persian character not easily legible. It is copied in 10, *a.*

**Fig. 11.** The last coin of this series is a silver coin, already depicted as 43 of Mr. WILSON'S plates, very rude in execution, but of strong relief. The fabrication of this is decidedly Hindu, and the inscription on the

\* A few more of these curious coins have been received in KERA'MAT ALI'S collection, but I do not introduce them here, being desirous of exhibiting the Manik-yála treasures unmixed. One bears the name of KRISHNA as *Srí Vásu Déva.*

reverse resembles the *Lantsu*, or pointed variety of the Nagari Alphabet, of which we have specimens from *Nipal* and *Tibet*. The words visible are *Crí yag* . . . .

*Obverse.* A rájá, coated, his disproportionate left hand seems to hold the hook before remarked ; the hair is disposed in curls ; on the right is a symbol resembling a tree, but it may probably be the sleeve of the right arm.

*Reverse.* I have little doubt that this rude figure represents a female standing, with flowing drapery ; the head and face are out of the die, but the breast and waist on comparison with other coins of the same type (for they are plentiful), fully bear out this conclusion.

The contents of this first box are peculiarly valuable, not only from the variety of coins here discovered to be contemporaneous, but from the presence of the Sassanian coin, which brings the epoch of the structure within cognate limits, unless indeed a dynasty of fire-worshippers reigned in these parts previous to the formation of the last Persian monarchy by ARTAXERXES in A. D. 223 : but we must postpone all speculations, and proceed with our description of the works.

The above box and its contents were found in their natural position, as deposited at the base of the square stone block of masonry which terminated there ; (I am uncertain however whether the French text will bear the interpretation I have given, or whether the *square* is not a hollow square or chamber “ on a trouvé un carré parfait a douze pieds, tres bien établi au centre, bâti régulièrement en pierres de taille et tres bien conservé :—apres avoir creusé dix piéds, &c.” and afterwards “ le tout au bas du carré dont la batisse réguliere s’est terminée là.”)

On the 12th May, the perforation had reached thirty-six feet, when another copper coin presented itself.

On the 22nd May, as it was imagined that nothing more would be found in the centre of the cupola, on account of the termination of the square building, an opening was made on the northern side, of the height of six feet, and twelve broad : the excavations were pushed forward at both points.

On the 25th May, a depth of 45 feet had been attained, when on lifting up a large quarried stone, another similarly squared stone was found underneath, having in its centre a round hole ; in the middle of this hole there lay deposited a copper box, somewhat similar in form to the gold one just described : it was perforated on opposite sides, (*Fig. 12.*) where apparently handles had been soldered on. The lid was decayed. Inside this box were found, *Fig. 13.* a little piece of cloth. *Fig. 14.* A circular crystal drop, and *Fig. 15.* A small cylinder of pure gold. (Whatever relic may have been in the gold cylinder has been lost.)

27th May. On this day, at the depth of 54 feet, another copper coin was turned up.



On the 29th, at the depth of 64 feet, an irregular hole appeared of six lines broad, in which were discovered

*Fig. 16.* A copper ring, and

*Fig. 17.* A cource (cypræa moneta).

At ten lines lower down were also found an iron ring and three more Sassanian coins, in a very decayed state, *Fig. 19.*

On the last day of the same month the principal discovery rewarded the Chevalier's labours.

An immense stone slab seemed here to cover the whole surface : it was removed with great labour and difficulty, and underneath was perceived with joy a small chamber or basin cut into the solid stone, a foot in breadth and depth, the interior of it built up with stone and lime ; in the midst of this, on its careful removal, were found, thus hermetically sealed, the second series of relics now to be described (*Plate xxii.*)

*Fig. 19.* A box of copper (supposed to be iron by M. VENTURA) filled with a brown compound liquid.

*Fig. 20.* Within this box and liquid, a brass cylindrical box, cast and turned on the lathe :—the surface of the metal was in such excellent preservation as still to retain the fresh marks of the tool, but the pinnacle on the top of the lid was broken off by corrosion, or in consequence of a flaw at the neck.

The lid having been made on the lathe also fitted perfectly tight, and must have kept in, without loss by evaporation, another portion of the thick brown liquid with which it was found to be filled.

On cleaning the upper surface of the lid, it was discovered that an inscription had been there *punched* circularly round it. The letters are formed by dots, but they are perfectly well preserved, and are of the first importance in making out the nature of the deposit. *Fig. 20, b* represents a facsimile of this inscription, which is again written below to facilitate its lecture. The character so strongly resembles an ancient form of *Nugarí*, such as might be used in writing, without the head-lines of book-letter, that sanguine hopes may be entertained of its yielding to the already successful efforts of our Vice-President and Captain TROYER. The same writing has been found by Dr. MARTIN and Mr. MASSON in other topes. The latter has favored me (through Dr. GERARD) with a transcript of two in which he finds the same words repeated. I have placed these on the same plate for convenience of examination.

In this brass box, 20, were five copper medals, *Figs. 28, 29, 30, 31, 32*, all differing in device, but of that kind already known to us from a multitude of specimens found in Afghánistán and Upper India, by the arbitrary name of "Indo-Scythic coins," and now ascribed by Mr. MASSON with certainty to KANERKA, KADPHISES, &c.

They are all wonderfully well preserved, and seem to have been selected to shew us the prototype of the very five species of coins to which the key monogram is peculiar.

Leaving these coins, as already familiar to us, although by no means exhausted in interest :—within this brass cylinder and buried in the brown liquid appeared a gold cylindrical box, *Fig. 21*, four inches long, by  $1\frac{1}{2}$  inch in diameter ; the lid fitting closely on the interior of the cylinder, which it entered to the depth of  $1\frac{1}{2}$  inches.

This box was also filled with thick brown liquid mixed up with a multitude of fragments of what M. VENTURA supposed to be broken amber (*ambre brisé*). *Fig. 22, a, b, c, d, e*, will give some idea of their appearance when washed. They were of a light yellow or topaz colour, which was driven off by a red heat, leaving them colourless. The first conjecture supposed them to be fragments of a glass vessel, which burst into pieces from the expansion or fermentation of its contents ; and that the small bit of string, *Fig. 23*, might have been used to bind the cover ?

Within the box was discovered also, *Fig. 24*, a small gold coin weighing precisely 30 grains ( $\frac{1}{2}$  drachma). The device resembles in some respects the larger gold coin in the first gold box.

*Obverse.* The king holding the spica and hook, (quere, sickle ;) dress as before described, and characters on the margin decypherable ; as, ONIKIKOPANO—the rest illegible.

*Reverse.* A sacred personage standing with his hand out-stretched in an impressive attitude ; his head surrounded with a halo or rather *sun*, as distinguished from the moon on the other coin. The four-pronged symbol occupies a place to the right, and on the left are some indistinct letters, KNIPO. The head of the figure is rather out of proportion, but the execution is otherwise very good.

There is also another minute coin of gold, *fig. 25*.

But the article of chief value in this cylinder is decidedly

*Fig. 26*. A plain disc of silver, upon which have been engraved certain letters, evidently calculated and intended to explain the purport of the whole mystery. The characters are precisely those of the lid of outer brass cylinder : but their combination is different. There can be little doubt of their affinity to the Sanscrit, but the difficulty of decyphering them is enhanced by the substitution of the written hand, for the perfect Nágarí, which it is clearly proved, from the coins discovered in the first box, to have been well known at the same period. The difference is such as is remarked between the *mahájani*, and the printed Nágarí of the present day.

I am unprepared to speak of the nature of the brown liquid, which must therefore furnish matter for a separate notice.

In the same receptacle of stone and lime were deposited outside the copper box a collection of forty-four copper coins : all matching with

one or other of the five types so carefully preserved within the brown liquid.

On the 2nd of June, one more copper coin was extracted, and on the 3rd of the same month, six more of a similar nature.

On the 8th June, the opening perforated from above met that from the side, and reached the earth beneath the foundations. The excavations were however pursued to a depth of twenty feet below the level of the structure without making any further discovery, until the setting in of the rains finally obliged the Chevalier to discontinue his operations.

I had delayed the publication of the above narrative in hopes of obtaining a section of the building, and a ground plan of the spot, which Captain WADDE had obligingly written for at my request; but the lamented illness of General VENTURA and his visit to Loodiana for medical advice have precluded the possibility of its arriving within a reasonable time; it may however still reach me ere I resume the subject, which I must now drop, to admit of the insertion of Captain GERARD'S and Mr. MASSON'S further details on this interesting field of discovery. I have before alluded to Dr. MARTIN'S prosecution of excavations at Jelalabad: the extent and success of these, from Dr. GERARD'S account, is much greater than might have been expected. While he was pursuing his search in this direction, Mr. MASSON was equally active in the plains of Beghram; where his good fortune in the discovery of coins and his talent in decyphering, arranging, and describing them, and eliciting useful results, have been made conspicuous by the valuable memoir read on the 30th April, to the Society. A subsequent note from him to Dr. GERARD, (from which extracts will be given presently,) puts us in possession of the progress of his operations on the Topes up to the end of March last. Dr. GERARD himself also remained at Kabul some time, zealously pursuing the same inquiries.

Thus we shall bring together in one view the history of the opening of the Punjab mounds up to the present time, when we may suppose them to be nearly exhausted of their treasures; but we must remember that, however successful subsequent researches may have proved,—to the Chevalier VENTURA must be awarded the palm of originality in these discoveries: while he alone perhaps could have commanded sufficient influence, from his position in a dominant court, to overcome all the scruples and difficulties which the first enterprise of the kind naturally presented. When once it was found that treasures lay hidden under the topes, a stimulus was furnished for the prosecution and completion of similar researches, and I fear it must be added, for the demolition of these mysterious monuments of past ages.

II.—*Memoir on the Topes and Antiquities of Afghánistán.* By J. G. Gerard, Esq. Surgeon, Beng. Est., addressed to the President of the Asiatic Society, from Jelalábád, 4th Dec. 1833.

[Read at the Meetings of the 30th April and 20th May.]

The topes or edifices of which *Manikyála* is already familiar to us by the enterprising researches of General VENTURA, had appealed to our curiosity in the journey to *Turkistán*, but three only were visited en passant; viz. *Manikyála* itself, one at *Usmán Khátir* in the basin of the *Indus*, and another at *Pésháwer*. On my return to *Kábul*, in November last, ample gratification awaited me, through the zealous exertions of Messrs. MARTIN HONIGBERGER and MASSON, whom I met in that city.

The interest excited by the labours of these travellers (as might be supposed) was not limited to the mere inspection of their collections, which were displayed to me with an open candour that leaves me their debtor. I followed up the inquiry to which they had unfolded to me the clue; and though unproductive of similar results to those which have crowned their exertions, I am enabled to speak to some points from actual experience, and hope to have it in my power to add more hereafter.

The monuments now about to be considered, which were first introduced to our notice by Mr. ELPHINSTONE, are calculated to rouse the attention of the antiquarian and the philosopher, when he surveys the relics they disclose in connexion with dynasties, of which all our knowledge is scarcely more than the faintest lineaments, and of the events to which they yielded and ceased to exist, history gives us little or no account. To have a prospect of filling up a blank in chronological annals is of itself sufficiently interesting, but it is doubly so when these may serve to illustrate the career of one whose exploits are a theme of so much fame, and whose foot-steps have employed so many pens to trace even consistently.

These ancient edifices may perhaps present to us the sepulchral remains of the Bactrian kings, and others who succeeded to their sway; but, whether we view them as cotemporary with the Grecian dynasty of *Balkh* in *Turkistán*, or of those subsequent satrapies which emanated from the remains of that kingdom, the same thoughts recur, the same suggestions rise, Who were those kings? and what was the extent of their individual sway in these and other regions? for there is no doubt that the whole of the *Panjáb*, and even a great part of the Gangetic territory and *Sind*, were the seat of their dominion, whether this was Indo-Scythic or Indo-Grecian;—by what revolutions their reign termi-

nated, and they themselves became extinct? and who were their successors till the period when the frenzy of Muhammedan religion overturned the whole institutions of the country? These questions, which involve many others, may yet be answered by these memorials.

Ancient history is sufficiently intelligible, and conducts us to the path, and even the allocation of Macedonian conquest in *Afghanistan*; and if identity in the appellations of places is still perplexing, and even apparently inaccessible, it must be assigned rather to a deficiency in ourselves, than to a result produced by any interchange of language that may have occurred during the lapse of ages; for instance, if a person, familiar with Sanscrit, were to visit these regions, there is no doubt that things would speak to us, instead of awaiting to be interrogated.

We are indebted to Col. WILFORD for a knowledge of the fact, that the names of all the places in ALEXANDER'S route from *Bamián* to *Multán*, are pure Sanscrit.

The Persian will also assist us in the inquiry. I need scarcely mention the single word *Panjáb* (i. e. *panj-áb*), five waters; or Hydaspes (*Jhilam*), the initial syllable of which answers to the Greek term for water, and the last to the Persian word "*asp*," a horse; and it is notorious, that the *Doáb* (two waters, or rather the land between them), of the *Jhilam*, is famed for a breed of fine horses called *dhaní\**, and also of fine women. It is related to us, that so many honors were reported to be paid to beauty in the country of the Cathæi under King SOPHITES, that even dogs and horses were selected for their quality; and farther, that notwithstanding their barbarism, this nation was first in wisdom, being ruled by salutary customs, one of which was, that children born with disproportions in any part of their body were to be killed; nuptials being only influenced by beauty of exterior in children: a commentary upon this will readily occur in the practice of the present day, and the usages which prevail in the territory watered by the Hydaspes. In *Turkistán*, the field for etymological affinities is equally prolific: the river Jaxartes, we are told, is read in the Mongol *Ixiartis*; but the Túrks also call it *Secandriæ* or ALEXANDER'S river. The river *Sogd* retains its name, as we find from ISSIT OOLAH'S Journal. The Sogdrians are therefore readily recognised as the people inhabiting the course of that valley. The Getæ must be identified with the *Jogatai*, who inhabit *Zataria*; beyond the limit of *Farhand* and *Kashgar*, and of which stock the present king of Delhi and his relative, the sovereign of China, are descendants. *Balkh*, I think, Colonel WILFORD designates in the Sanscrit *Bahalac*; also *Ba-*

\* Mahá Rájá RUNJEET SINGH gets his best steeds from that district.

*mián*, in *Vimiyán*. *Bakhtra*, of which *Balkh* was the capital, is the native cognomen which the Greeks modified into the more liquid sound Bactria or Bactriana. *Bakhtar*\* is applied to *Kábul* to this day, and occurs in the histories of those countries; but if this proves any thing, it is that the Greeks retained the appellation, and did not bestow it. *Pesháwer* is known as a district of *Baigram*, which was a province of *Bakhtar*; in short, a philologist coming into those regions would find synonymes at every step, and could not fail to elucidate etymologies, which we at present receive as vitiated beyond the limits of analysis, and inaccessible by synchronotic induction. In this view, the *Afghán* or *Fashtú* language may furnish us with many idioms, and especially the local dialects of districts which have resisted Muhammedan conquest, and are comparatively in a state of primitive simplicity. The vernacular dialects of the *Tájiks* (simply crowned heads or descended of kings,) the aborigines of the country, may be expected to elucidate something; for it is there we can hope to find traces of far antiquity; and if sepulchres alone are the result, they may at least enable us to connect local affinities, and fix the situs of some monarchs whom we already know to have been extant, but of whose reigns and institutions no vestiges have hitherto been discovered; and though the inference is, that they perished by the sword of the Khalifs, which swept away almost every written memorial of a prior epoch, it would be an extreme conclusion that some annals of the dynasties which followed the Grecian empire, if not those of the original settlers in *Balkh*, may not exist. The period of 1200 or 1500 years is far from incompatible with the expectation of finding inscribed legends either in stone or metal. Coins, the representatives of nations, are already in our possession, and obnoxious as they are to Islamism, as the types of idolatry, they have survived both the ravage of time, and the intolerance of bigotry, and still mock the prejudices of religious zeal; we may therefore expect to find remains that will afford local illustrations the more interesting to anticipate from the very obscurity of the subject, the total absence of research at any former period, and the barrenness of history and tradition concerning such events.

The topes or tombs which appear in the environs of *Kábul* are planted along the skirt of the mountain ridges, which support that elevated plain, and this peculiarity is common to almost all of them: the adjacent level has obviously been the basin of a lake or sheet of standing water, till drained away by the course of rivers, and it still continues more or less a quaggy marsh. The first settlers seem to have

\* I don't know if it occurs in *BABER's* Memoirs, but I think it does in the *Timúr Nama*.

chosen the rising ground at the roots of the hills for their locations, the ancient city of *Kábul* (still visible in the remains of mounds or heaps) also occupying that basal line.

The position of the monuments, if not influenced by natural causes, or selected from motives of religious veneration, is rather fanciful; those which I have seen being either situate close under the cliff of the mountains, or secluded within recesses, wherever a running stream had its course; and it would appear that a rill of water nourishing a few trees or patches of cultivation and verdure was a conjunctive feature of every spot. The most usual site of those structures is an isolated rising ground, washed by a perennial current. Trophies of such magnitude, serving merely as receptacles for the dead, and often devoid of any traces either of them or of the living, sequestered and almost shut out from sight, will not be sufficiently intelligible to our ideas, except by comparing them with edifices in other regions of the world, the object of which is known:—if they had been smaller they must have fallen to ruin in a few centuries. The masses of *Manikyála* in the *Khyber* Pass and at *Pesháwer* almost forbid the idea of identifying them as tombs, except some more decided proofs are forthcoming than have yet appeared, though we are not without analogies in the size of some of the Muhammedan cemeteries, not to speak of the pyramids of Egypt themselves, while the absence of any inscriptions to denote another purpose, leaves us in the former belief.

Of the sepulchres excavated by M. MARTIN HONIGBERGER, amounting to more than thirty, the greater part have their sites at *Jelálábád* and the adjacent territories, and it is this spot particularly that commands our notice, since it may be assumed to have formed the seat of one of the Bactrian sovereignties, as *Bálkh* did another; the more readily as it would seem to answer in its local and conformation to the spot which ALEXANDER consecrated with Bacchanalian revels; and it is certainly from physical position fully eligible for the capital of a kingdom, uniting, as if by a band, the temperature and even some of the productions of an intertropical climate, with zones chilled by perpetual frost, having a considerable expanse of level, and a soil irrigated by perennial streams. Here we behold the tombs of a long race of kings (as I suppose them to be) which have survived in obscurity the lapse of many centuries: a large proportion of them, indeed the majority, have crumbled into mere tumuli; but, except those opened by Mr. HONIGBERGER they appear to have been hitherto untouched by the hand of man.

Muhammedan bigotry, which swept away all the traces of written knowledge within its reach, and defaced the memorials of whole nations,

has spared these cemeteries : yet this does not surprise us when the *Bhúts* of *Bamián*, such gigantic types of idolatry, remain trophies of cotemporary or even prior ages. These wonderful images are mentioned in the Koran, and if we admit the authority of the *Mahábhárat*, and the still more fabulous history of the *Páandu* dynasty, their antiquity will approach to a period co-existent with the fall of the Grecian kingdom, which is perhaps somewhat repugnant to conjectural analysis ; yet we must either assign that date, or an epoch antecedent to ALEXANDER'S conquest, for the construction of those wonderful idols.

But, to return to *Jelálábád*. The topes are here very thickly planted on both banks of the river, which washes the northern limit of the valley ; the declivity of the soil being from the snowy ridge of *Sufféd koh*, has thrown the stream quite to their base, and here the tombs appear, black with age, extending from *Bálá Bágh* to the conflux of the *Kábul* river at *Drona*, about 10 miles downward and four from *Jelálábád*. As we passed along, several were noticed, which did not appear to be elapsed ; but they had no doubt been excavated at their base, since it is in this immediate vicinity that recent discoveries have been chiefly directed.—In the plain were seen the ruins of others which had subsided into mere heaps like cairns : these were standing in the midst of green fields, but this is rare ; and upon a shelf of conglomerate rock, and diluvial accretions continuous from the roots of *Sufféd koh*, and here forming the cultivable limit of the valley on the south, extends a long line of tumuli or ruined sepulchres, insulated upon natural eminences ; though often upon raised platforms, a dozen of these may be recognised, not as mere visible heaps, but mounds of great size, and which until very recently had been undisturbed by man\*. Several having been opened by Mr. MARTIN HONIGBERGER with sufficient recompense. Their position is strange enough, upon a bare rugged surface of attrited stones, furrowed by the intersections of water-courses, the cliff of which formed of agglutinated pebbles, or pudding stone, is hollowed into recesses which were represented to me as the caves of the *Káfirs*, or “unbelievers :” they are still inhabited by the pastoral tribes, who migrate with their flocks, according to the seasons of the year, and take up their winter quarters in these Troglodite abodes. The site of the topes commands the whole landscape, which is limited to a narrow slip of luxuriant cultivation, sloping to the cavity of the valley ; the interval southward, of ten or twelve miles, being a high plain of gravel, pebbles, and rolled stones, all sterile and arid to the foot of *Sufféd koh*, where again villages and

\* There is one immense edifice, but now crumbled into a mere heap, near *Jelálábád*, which serves the *Nawab* as a prospect point : he often repairs to it and seats himself upon its summit for hours to enjoy the fresh atmosphere.



horticultural productions abound, ramifying within the flexures of the mountains, or rising upon the acclivities, till checked by the rigor of climate. It must have been in this neighborhood that ALEXANDER revelled in imitation of Bacchus, and there is actually a spot upon the flanks of the snowy ridge that would seem to correspond with the locale of that event, the summer residence of the Nuwab of *Jelálábád*, which is described as affording the most delicious transition from the heat of the valley, embowered in the most redundant ever-green verdure. This portion of territory acknowledging but a capricious allegiance to the Nuwab, and a less certain attachment to his authority, is seldom frequented and little known; and though it is affirmed that there are no monuments beyond the line above alluded to, I cannot doubt that research would be repaid, and that along the skirts of a magnificent range, crowned with eternal snow, tombs will be discovered: the situation almost warrants the belief, if that has been selected from a regard to natural concomitants, and in *Kábul* the choice has evidently been influenced by such circumstances, for we cannot otherwise account for a position that connects its objects with the surrounding gloom. There, in one of the recesses or glens deeply locked within the mountains, stands a Grecian pillar called *Surkh Minár*, from its red colour. The site is isolated upon a natural eminence, showing a steep acclivity, lofty and almost mural cliffs rear on all sides. Another Grecian monument or minar, appears perched upon the crest of the ridge, at a great elevation; neither of these bear inscriptions nor any kind of device, but I am informed there is no doubt about their origin.

The decay and most commonly total wreck of all the edifices planted upon the southern margin of the dell at *Jelalábád* is easily explained in the nature of the materials that have composed them, which are pebbles of vast size, or blocks of stone, attrited by water to smoothness, conjoined by a cement of mud. They have consequently been easily delapsd, and have crumbled away into mere heaps, like gigantic mole-hills. Where these have been excavated at their base, a small hollow square or cavity is disclosed, formed of hewn stones\*, wherein was deposited whatever remains were designed. These topes differ very materially from that of *Manikyála*, and *Usmán Khatir*, where the square is continued from the top in the form of a shaft. In none of those which I have seen, or which have been opened by Mr. HONIGBERGER, does this conformation occur, and we may at once note it as a distinguishing feature in these fabrics, which has no doubt a local import. There are indeed few exactly similar; for they vary in size, in external decorations, or in their structure; though the contour has

\* Then the *carré* of Gen. VENTURA, about which a doubt was expressed in the foregoing paper, was a hollow, and not a solid, square.—ED.

a generic type, as we should expect, if the mausolea represented the offspring of a single and original dynasty; however much its character might be altered by the interchange of successive generations, deriving new ties of consanguinity, in the same manner as ALEXANDER did, intermarrying with the conquered, which he considered a link of union in a government, that was to become dependent upon its natural resources, though perhaps the only apology that he could offer for the sudden transport of love which wedded him to ROXANA.

The contents of the thirty or more topes excavated by Mr. HONIGBERGER are of the highest interest. Many of them were indeed unproductive of any insignia by which we can identify their original design, or connect them with their founders: a circumstance the less remarkable, when we consider the surreptitious interests of the workmen often employed remote from any control, but even where control embraced the entire operations the labour often ended in inanity. Many of the sepulchres (perhaps most of them) are comparatively small\* ; from 30 to 45 or 50 feet high, with a circumference of 80 to 110 feet; and not one of them presented the structure of *Manikyála*, or a hollow shaft penetrating from the top, filled up however with the materials of the building, and discovering deposits of coins at various intervals, which continued beyond the limit of the shaft or 25 feet, to the base where the excavated stone reservoir was found, that proved so fruitful of reliquiæ. Nothing answering to the above has accrued to Mr. HONIGBERGER, if we except a single gold coin, I believe of SOTER EAGUST†, which was found in one tope lodged within a silver cup, but a similar cup yet unopened, would seem to argue the prototype of that acquired by General VENTURA. The exterior is a hard metal, containing a fluid which is perhaps inclosed within a golden casket like that of *Manikyála*; on perceiving which Mr. HONIGBERGER with provisionary care cemented the whole cylinder, till he should lay it before his countrymen at Vienna. With the above solitary exception, I do not think any coins were elicited from the tombs, nor any other device indicative of the object of their erection, though it would be an extreme supposition to entertain, that such fabrics should be raised as mementos to posterity without a single trait

\* In the gorge of the *Khybar* Pass which penetrates the country from *Pesháwer*, stands a most magnificent edifice, equal to or exceeding that of *Manikyála*, and if I am not mistaken, there are others. Mr. HONIGBERGER sent a servant to explore the antiquities of this district, habited as a faqír or mendicant, his best or only passport among people who live by pillage. He tempted the *Khyberis* to dig by the prospect of treasure, but they would do nothing without pay and the object was thus (fortunately) abandoned.

† *Soter-megas*, see Mr. MASSON'S Memoir, page 169.—ED.

to connect them with the individuals whose existence they commemorate\*. The relics which have accrued to Mr. HONIGBERGER are however extremely curious, consisting of very minute bones, or their dust, pearls, pieces of amber and rubies, and different kinds of sedimentary remains, the nature of which can only become known by chemical analysis. These were found reposing within excavated (turned) cylinders, of a soft striated stone, quite similar to that of which the shot and shells of H. R. H. ABBAS MIRZA at Meshed are made. These cups, both in their size and form, correspond to a model which is frequent enough in India: they have a lid surmounted by a small knob. A roll of paper, apparently the back of the *Bújpatra*, containing written characters, occurred in one instance; this precious fragment may unfold some satisfactory evidence of the origin and design of the edifice which enclosed it. Small burnt clay lamps, and occasionally square or oblong clay receptacles, filled with osseous remains, gems, and thread, are among the collection. If my memory does not deceive me, I think I remarked small golden images of birds, while I am certain that many things escaped my observation, and also that I retain but a very imperfect idea of any individual relic, notwithstanding the candor and liberality with which they were displayed to my view. I felt backward to gratify a curiosity that had little to recommend it, and the brief and defective notice I have now taken of Mr. HONIGBERGER'S discoveries, while it can only convey but a faint trace of the facts which remain for original analysis, I venture to believe will receive from that gentleman the only construction that its motives can be supposed to meditate in making it. One object may indeed be gained, since Mr. HONIGBERGER has already embarked upon a long and perilous journey viâ *Bakhtar* to his native land†, after having given charge of all his valuable acquisitions to Chev. ALLARD, whose prospects of returning to Europe seemed to offer a favorable passport for their transmission to Germany, but which I have since learnt is likely to be protracted indefinitely. Under such a view, the foregoing remarks, if deemed worthy of being read before the Asiatic Society, may become known in Europe through the medium of a journal which has already in these obscure regions (as will soon be shewn) stimulated the development of antiquarian research, and in this immediate instance is calculated to communicate and preserve the merit of labors, which natural and adventitious causes might otherwise tend to consign to oblivion.

\* There are inscriptions on the brass cylinders deposited in the topes; see the foregoing paper.—ED.

† See note of this traveller's adventure at *Bamian*, p. 246. It is fortunate that he had left his coins and relics behind.—ED.

Mr. HONIGBERGER would only have promoted his own views, had he made the Journal of the Asiatic Society a channel of publicity to his discoveries, since it is fully probable that subsequent laborers in the same field will weaken the interest of his researches, before that gentleman can reach his own country (which must be considered a problem), or the fruits of his exertions shall have quitted British India. These are destined to enrich the Cabinet of Vienna, and we may imagine the precious banquet they will afford to such eminent literary patrons as KLAPROTH and VON HAMMER.

[We thank Dr. GERARD most cordially for his zeal on behalf of the Journal, but it would indeed be presumption in us to imagine the German Doctor's coins could be better disposed of here than in the hands of the eminent men he names. We appeal to M. SCHLEGEL'S note on Bactrian coins too often to allow of our undervaluing such high authority. We have been obliged for want of space to curtail the foregoing memoir, and to omit for the present Dr. G.'s remarks on the climate and country of *Kábul* and *Jelálabád*. We have said nothing on his hypothesis that these mounds are the sepulchres of kings; a theory also adopted by Mr. MASSON, but contradicted by most other authorities, who look upon them as Buddhist structures. This supposition is confirmed by the existence of similar mounds in Nipal and elsewhere, and by the very nature of the relics discovered in them.—ED.]

III.—*Extracts from Mr. Masson's Letter to Dr. J. G. Gerard, on the Excavation of Topes, dated Tattung, 22nd March, 1834.*

The fourth tope I opened had in its centre a small chamber, with nothing therein but a little loose dust. I excavated to the very soil beneath the foundation, but nothing farther was discovered: eighteen days' labor were expended here. In the central chamber was a small cobweb with its tenant, a spider, apparently in good health and spirits. The tope was 144 feet in circumference, and how the insect got there, and contrived to live, is somewhat astonishing; if he introduced himself at the period of the erection of the tope, he must have been above 1600 years old. I know not whether naturalists will concede to his species such extraordinary longevity. The results of three other topes will be known within the three next days. Of one of them a *nishán* or token of there being something has been brought to light. Although by the experience of the fourth tope, I find that some of these structures do not contain relics, by which they may be identified, as coins, writings on leaves, &c. yet from the experience of all hitherto opened, I am confirmed in the opinion, that no one is without a sign or token of some kind, if it be only a small recess or chamber in the centre. Ultimately, a line of distinction may be formed between the topes of

sovereign princes, members of their family who did not rule, and of saints, at least it so strikes me on a *prima facie* consideration of these monuments; but there is one misfortune, that the contents of none can be judged by the mere appearance. To ascertain them it is necessary to excavate; and tokens the most useful to antiquarian or historical research are often extracted from such whose appearance is least inviting, and vice versa. The topes, which are well preserved, and whose outlines are clear, are also excavated at less expence, than the dilapidated ones whose outlines are faint or totally defaced. With the first the sanctum sanctorum is reached without chance of error: with the last, the direction of the excavation depends more on chance, and there is the additional trouble of penetrating through the mass of fallen materials around. The famous *Nandirâ* tope, 164 feet in circumference, was opened in eight days; a much inferior one on the level plain, from which I now expect something, and which has a circumference only of 108 feet, has now employed the same number of men twelve days.

My search for coins at this place has been very unsuccessful; I look forward however to a glorious stock from *Kâbul* this year, and only hope that my competitors may not raise the market too high for me. I have an idea, if funds permit, to send one of my men to *Balkh* for a couple of months, for the purchase of antiques: this will moreover depend on my verifying what I have heard from two or three sources, viz. that old coins are readily procurable at that place and neighbourhood. Now that Bactrian coins excite so much attention, you may, if you please, let Mr. PRINSEP know that three years since Major TAYLOR at Bagdad had some sixteen or seventeen Bactrian silver tetradrachms, and that two gold Bactrians were procured at *Tabriz*, both or one of them by Dr. CORMICK. That gentleman's coin was stolen from him. Major TAYLOR intended his coins, with a vast number of others, for Sir JOHN MALCOLM.

I have heard nothing farther concerning MARTIN. I learn that he did not forward to Captain WADE the account of his operations on the topes of *Jelâlabâd* and *Kâbul*, which he had prepared for that purpose in Persian. When I wrote the notice on the *Beghram* coins, I supposed that he had sent it, as he even read it to me, and made the remark that Captain WADE might publish it if he pleased. I observed that Captain WADE was not likely to do so unless authorized by him: he therefore by a letter authorized Captain WADE to make it public. Neither one or the other was probably sent, and this I merely note in case I may have alluded to this account in the memoir, which I presumed would have been published by the Indian press. The account was simply one of the operations and discoveries, without any hint or opinion as to what age, &c. they had reference.

I have some idea of publishing a detached small volume in India, (that is Calcutta,) "An Account of the Topes of *Afghanistan*," with sketches of the whole. I apprehend that India is too limited a field to expect any extensive sale for any literary work whatever, nor do I know how the publication of works is managed in Calcutta, neither whether engravers would be found to execute the plates. Of these there would be some thirty or forty, or perhaps more. Neither am I satisfied that any one would undertake the expence of publication, nor am I sure that a publication by subscription would be sufficiently encouraged. I have set in order a general and individual account of these topes, explaining their site and identification as far as the relics extracted from them testify, with my conjectures respecting all and each of them: these conjectures involve some points of history and geography not to be avoided. I have also taken sketches of all of them, at a certain measured distance, and used a camera lucida, that their comparative dimensions in the sketches might be exactly preserved\*.

I have not heard whether M. MARTIN, on being despoiled, lost his gold medal of KANDHISES: as he justly prized it he always retained it about his person, and it was the only one of his coins, excepting perhaps the silver ones of MENANDER and EUTHYDEMUS, of each of which he had one, that he did not forward by your medium to M. ALLARD. If he lost it, it is fortunate that I preserved the sketch of it. (See Pl. xiii.)

I hear nothing conclusive here of your researches at the Peshawar tope. OSMAN notes in his letter to me that the statues are very wonderful and beautiful. I trust you will have found a prize there; they are certainly a very singular discovery, and may occasion a good deal of speculation as to the nature of the monument; it will be highly interesting if their *caste* be recognizable.

I inclose a copy of the inscriptions<sup>a</sup> around<sup>b</sup> the *koti* or box extracted from a tope here, as noted in my last. This if you think fit may be forwarded to Mr. PRINSEP for notice in the Journal<sup>†</sup>, and he may invite those who are competent to decypher it. There must surely be individuals at Calcutta, certainly at Bombay among the Parsecs, who

\* We should be most happy to second Mr. MASSON's project, did we think that he could be rewarded by any sale or subscription in Calcutta. It would certainly be preferable to publish in Europe, with all the advantages of good engravers, a large reading public, and the various facilities which publishers there enjoy of interchange and communication with others of the profession at home and abroad. There is besides a heavy duty on importing into England works printed in this part of her dominions! The camera lucida sketches will be most valuable.—ED.

† See plate xxii. and the remarks in page 319.—ED.

can read the Zendavesta in the original. I should fancy a reference to the article ALPHABET in any of the Encyclopedias would exhibit the value of the Zend and Pehlevi characters. I note in a memorandum the equivalent characters of the Greek Bactrian coins to five Greek names and cognomens, and could have carried the subject farther, did time allow\*.

Your messenger brought a letter for the Nuwab from *Osman*, and this caused his detention to-day. I visited the búrjes or topes in hand : the one I noted as expecting something from is not yet got through : in the centre was a kind of structure in form [as in Plate xxii. Fig 27], the bottom has not yet been reached. I hope to-morrow will produce something. The topes with these forms of inferior *gumbazes* or domes, &c. in the centre, are very suspicious ; I fear in some instances these are the only tokens they contain, and they do not give much information.

23rd March, 1834.

C. M.

IV.—*Journal of a Tour through Georgia, Persia, and Mesopotamia. By Capt. Mignan, Bombay European Regiment, Fellow of the Linnean Society of London, and M. R. A. S.*

[Continued from p. 280.]

Speaking to Prince GALETZIN of the Russian Cavalry, who had been attached to the Count's staff in Turkey, he said, " We do not lose half so many men as you are inclined to believe ; since on the instant a man is infected, we plunge him in *iced water*, wash all his linen, and on the second day he is sure to be convalescent." That the soldiers of the Russian army should be infected, can create no surprise whatever. Their filthiness is proverbial. I once saw a regiment paraded to perform (as I imagined) their évolutions. On being drawn up in line, a serjeant stepped out to the front\* with a long broom, and rubbed down the men, as our grooms do horses. Had I been on the parade ground, I might have been *murdered* by an attack of lice—a second plague which has smote this land. A punishment parade succeeded this novel scene, and several offenders were brought forward. The drum-major passed down the line, and actually spat into the mouths of the prisoners. The reader is tired of a narrative so disagreeable. I can assure him, that my disgust to this nation is founded on practices that exist not amongst the most barbarous people. I leave them to their admirers.

On the morning of the 8th of February, we quitted Ganja for Zodi, distant four leagues. On leaving the town, my attention was attracted

\* We shall take an opportunity of introducing these in a subsequent plate, with many more of the same character as are now within our reach from the collections of Shékh KERÁ'MET ALI, and Munshí MOHAN LAL.—ED.

by a crowd of women, arranged in a circle, who appeared to be overwhelmed with grief, making a singular noise. Approaching nearer, I observed that they were sitting round a grave, and mourning the loss of a relative or friend whose remains were deposited in it. Some were howling aloud, as if suffering from acute bodily pain, and appeared to feel deeply on occasion of the loss sustained. Others however, I could clearly perceive, were acting a hired part,

—————“ And live upon the dead  
By letting out their persons by the hour  
To mimic sorrow, when the heart's not sad.”

Scriptural passages appear to warrant the conclusion, that the posture of these females, and their manner of going through a scene expressive of grief, must have been a very ancient custom. The description given of the children of Israel, after the destruction of Jerusalem, exactly corresponds with the situation of these mourners. “The elders of the daughter of Zion *sat upon the ground*; the virgins of Jerusalem *hang down their heads to the ground.*” (Lamentations, ii. 10.) The prophet Isaiah thus alludes to the desolation of Judea. “She being desolate, shall sit on the ground.” (Isaiah, iii. 26.) And it may be added as a striking fact, that I have a Roman medal, found during my travels, that represents Judea under the figure of a woman sitting in the attitude of grief. The custom of hiring people professionally to lament obtains among the natives of Greenland.—“The women continue their weeping and lamentation. Their howl is all in one tone; as if an instrument were to play a tremulous fifth downwards through all the semi-tones.”—(Vide Crantz's History of Greenland.)

We now proceeded over an extensive plain, which had a wild heathy aspect, interspersed with irregular hills of gravel, covered with tufts of dry prickly herbage, and withered aromatic plants; among which were vast numbers of the florican, bustard, and black-breasted partridge. The latter is a very singular bird: round the eye it exhibits a warty skin; on the foot a small spur, bare and black; the forepart of the leg covered with short ferruginous feathers; and the bill convex. The male and female are of the same colour, though the former has black spots, which on the latter approach to a yellow.

After proceeding some miles, we crossed the river Kourak in front of some snowy hills, which were one untracked surface. Here, the prince, who was a keen sportsman, obtained some capital shooting: indeed all travellers pursuing this route would find many modes of dissipating the tedium of their journey, as game of every description is most abundant. Our table groaned under the wild ducks, partridges, quails, floricans, and bustards, which were daily supplied by the prince



and Mr. CORMICK his physician. We went cheerily on, over a succession of finely undulating hills and dales, till we reached our halting place at three o'clock P. M. with no more fatigue than if we had taken only a morning ride.

We left Zodi at seven o'clock next morning, still traversing the plain in a direction south  $50^{\circ}$  east. The country, though so extensive, changed nothing in its appearance, excepting that the hills stood thicker and higher. The weather was delightfully pleasant, and every thing breathed the air of spring. We proceeded along the left side of the Aligez, close to the base of its mountain-wall. Its sloping sides were thickly set with hamlets and enclosures, which produced a most delightful contrast to the regions of barren rock which pended above. Continuing our march, the plain widened between more equally undulating banks, and soon after we discovered an addition to our party in the shape of a greyhound. His service proved an acquisition, for scarcely had we seen him, ere a herd of antelopes presented themselves along the slope of the hills near the low ground. We allowed them to advance upon the plain, and then slipped the dogs. The antelopes darted before us like a flash of lightning, and the Persians halloed like thunder. The sport became both animated and delightful, and the steeds, having a fine even plain before them, kept well up. At length the chased animal finding the dogs gaining upon him, made for the hills with redoubled speed, when Prince KHOSROU, who was in the way as he repassed within musket shot, fired and so wounded him that the dogs were on him before he could traverse another fifty yards. He was placed upon the back of a mule, and proved a capital addition to our travelling stock of provisions.

We now took a descending position, due east, over a stony and difficult road; which carried us through several rocky defiles, and over the river Terter, till we reached a small Muhammedan village named Sauk Boulak. We halted there for the night, and slept under the roof of a hospitable Mussulman, who roasted a sheep whole, and gave us some excellent coffee. On the morning of the 10th, we left our kind host, who appeared glad enough to see us depart, having been frightened by the fierce looks, and glittering arms of the Prince's attendants. We set forth over a road leading due south, passing to the westward of Shesha, the capital of Karabagh. On our way, we saw several Cossack stations, where our conductor, the Russian General, changed his baggage horses. These posts consisted of a few miserable straw huts, and the soldiers appeared performing the most menial offices. As we passed along, they stood with their heads uncovered; and the people of the country likewise observing this ceremony looked ridiculous enough, since their heads were closely shorn.

This province is laid down in ancient maps as the country of the Sacaseni, a brave tribe of Scythians, mentioned by STRABO, which the learned now-a-day try to prove are from the same stock as the Anglo-Saxons. To the eastward is the province of Shirwan, the ancient Albania, the scene of so many actions of CYRUS, and subsequently of POMPEY. Not far hence, the Koor mingles its waters with the Araxes, thus forming the apex of a triangle; and the united streams, turning abruptly to the south, discharge themselves into the Caspian Sea. From a series of observations, lately made with Fahrenheit's thermometer in boiling water, at different heights, on the shore of this sea, it appears that water boils at  $212^{\circ}.75$  and the barometer stood at  $28^{\circ} 7' 1''$  \*; hence the surface of the Caspian is 375 feet below the level of the ocean. PALLAS in his travels, speaks of the low level of the Caspian, compared with other seas. ENGELHARDT and PARROT, in their late journey to the Caucasus say, that the surface of the Caspian is 308.8 French feet beneath that of the ocean. The Koor contains a greater body of water than the Araxes, though its course is less rapid. CYRUS is said to have been murdered on its banks by the neighbouring mountaineers.

The weather, which for the last week had been so mild, became suddenly extremely cold, with a cloudy sky, and seven degrees of frost. Our track lay over an uneven plain for nine miles, when we began a gentle ascent up a hill to the south-east; and passing over its brow descended on the opposite side by a narrow and romantic path towards the river Parianzour. Following its course for two miles, we entered a deep wood. The thickets through which we plunged to reach a new ascent were covered to the depth of two feet with snow, and the difficulties our horses encountered from such insecure footing increased at every movement. The track up the height itself did not afford a more secure one, and when the ascent was gained, similar obstacles presented themselves. We had to pass along the ridge of a chain of rugged hills, whose situation exposed us to every blast, while the road itself over which we travelled some hours, was slippery and dangerous. At the end of fifteen miles, we reached Gorouzour, where some Cossack horses were changed. That done, we recommenced our march over the same rough ground, till we came up to an encampment, where we halted for the night. The portable houses of the peasantry of the country, we found comfortable enough. They cannot be called tents, although their structure is as simple. Several long rods, regularly disposed at the distance of about two feet asunder, surround a circular space from ten to fifteen feet in diameter, and form the skeleton of the walls, which are firmly tied together by bands of hair ropes, hitched round the end of

\* Sic in MS. perhaps  $28.71$  French inches.—ED.

each rod to secure it in its position. From the upper ends of these, rods of a similar kind are bent, so as to slope to the centre, and being thus tied with ropes, form the frame work of the roof; over which is thrown a covering of black felt, leaving an aperture in the centre to give vent to the smoke. Similar coverings are wrapt round the sides, and to keep all tight, another frame is bound externally, formed of cane tied together with strong cord, which firmly unites the whole. The aperture at the top is closed, as occasion requires, by a piece of felt, which is drawn off or on by a strong cord. Our next day's journey spread a whole region of snow before us; hill and dale one dreary waste, with a sky threatening a still more deepening fall. Winter had here laid his "cold and shrouded hand" on every object: our halting place for the night was to be Koubat, about six leagues distant in a south-westerly direction. The road was better, which enabled us to reach our quarters early in the evening. It appeared a wretched place; nevertheless, I must do the natives of these wild hamlets the justice to say, that, notwithstanding the unpromising exteriors of their habitations, they evince a frank hospitality within, to be remembered with gratitude by every way-worn traveller. The description of their sepulchral-like abodes I have already given, but it may be as well to picture the interior likewise. On descending a few steps, we enter a room which fills the whole space of the house, being about eighteen feet square, an ill-proportioned size to the lowness of the dwelling. At one side we find the hearth with its chimney, and directly opposite a small aperture in the roof, to admit light and air. The earthen floor is beaten down very flat and hard; but carpets are spread when the inmates sit or sleep. No furniture of any description is to be seen. The walls are of dried mud, with recesses left in them to hold the utensils of the family. A small portion of the habitation is generally assigned to the korses, cows, or sheep, but they frequently mix indiscriminately with their masters.

We left Koubat with the cold at eight degrees of Reaumur, and quitted the now expanded channel of the Parianzour under a clear and beautiful sky. Our road led to the south-east, and a few hours' travel brought us to the banks of the river above mentioned, whose impetuous motion was staid in some places, and frozen to the depth of several inches. As we proceeded, the character of the plain gradually disappeared amongst hills, and we soon found ourselves in a narrow valley, which by degrees contracted to a rocky gorge of very steep acclivities. At the bottom ran a stream, whose waters in spring swell to an impassable height; but at the present moment they were hardly more than a rill, and flowed amongst the rocks, while we journeyed by its side, contemplating the beauty of the overhanging cliffs. We rode between

them for upwards of a mile, and then came out on a small plain; which appeared to be completely surrounded by mountains. Through an immense chasm to the east, I had a beautifully distinct view of the windings of the Araxes. Herds of antelopes were bounding over the precipitous sides of the mountains, and pheasants, which are seldom seen to the south of this river, were in great numbers. The source of this celebrated stream, which is boldly described by Virgil, "Pontem indignatus Araxes," is from the mountains a little to the south of Erzeroum, (the Arze of the Byzantines,) whence it flows onwards in a serpentine course; until in gliding through the plain of Irvan, it sweeps to the southward, embracing the provinces of Irvan, Nakshiwan and Karabagh; and finishes its impetuous course in the north-east, near the castle of Kalagan, where it mingles its waters with the Koor, when both these famous rivers roll into the Caspian.

An hour more brought us to the margin of the Araxes, at which point the power of Russia ceases—*for the present*. How long this may continue to be the boundary line, and whether it be politic for us to remain inactive spectators of these rapid advances and encroachments, requires our most serious consideration. Be the intention of the Government what it may, all Russian officers, during my residence amongst them, spoke of the march against India as an ultimate object of its policy; and if we felt alarmed at the proposed attempt of the French on our eastern possessions, we should have far greater apprehensions from any similar designs of the Russians\*.

Through the kindness of Prince KHOSROU'S Russian Mehmandar, we were accommodated in tents pitched upon the shores of the Araxes, as on neither side were any villages situated. The surrounding scenery was awfully wild. It was like a ruin of nature itself, as if the earth had been convulsed to her very centre, and rocks and mountains had been hurled from their foundations by the violence of her convulsive throes. In the hollow of caverns formed by these grotesque combinations, the shepherd and his flocks had taken up their residence, and secured to themselves dwellings which nothing but a similar revolution could destroy. From the verge of the stream I observed that its utmost velocity in the most obstructed channels was about six miles per hour; while

\* We are compelled to omit here our correspondent's observations on the subject of a Russian invasion, as unconnected with the relation before us, and not adapted for our pages, from which the discussion of political questions has hitherto been scrupulously excluded.—ED.

through the broad and shallow passages the river ran at the rate of from three to three and a half miles an hour only, in proportion to its depth.

As the day was mild and warm, I waded through the water from one cluster of rocks to another, visiting all the little islands which obstructed the passage of the Araxes: and it must be confessed that, to the admirers of wild and majestic scenery, nothing could be more romantically picturesque. Towering mountains were formed on each side the river of immense masses of basalt and black granite, heaped one over the other, and hanging in an endless variety of fantastic forms, while their broad shadows threw upon the surface of the stream a fine deep gloom, quite in unison with the scene. In the centre of the river were again seen smaller combinations of rocks, which formed innumerable islets, over some of which the water partially flowed, while their sharp points cutting the current in its course, created foaming breakers in miniature, the murmurs of which were the only sounds that disturbed the stillness of the calm. In some of the hollows formed by the annual friction of the rising inundation, when the Araxes was at its height, a bed of rich alluvial soil had been deposited, from which had sprung up young trees and bushes, the isolated verdure of which derived a higher beauty from contrast, and appeared like little Edens encompassed by a wilderness. The very rocks themselves too exhibited all the variety of form and colour; while their adamantine surfaces, exposed to the constant stream, were worn to a smoothness of polish, which art could scarcely give to them; and by the infinite variety of their positions, reflected the rays of an unclouded sun from every point like dark steel mirrors. Here were gigantic mountains of basalt, and rose-coloured granite, the latter crossed with veins of the finest porphyry and smaller lines of brilliant quartz, changing at every yard their hue of shade, and quality of grain: while the sublime solitudes of this dark and silent valley gave to the pure canopy above a brighter blue, and produced altogether a splendid picture of nature in her wildest garb.

Such a magic combination of forms and colours could not possibly be sketched with fidelity. Were the whole to be drawn and coloured on the spot, it would require the pencil of a CLAUDE to catch the beauty and the expression of the shades which vary with every hour, from the dawn to the close of day. The sun was sinking when we returned to the encampment; and I retired to my tent as much overcome by the magnificent impressions of the scenery I had beheld, as by the fatigues of our circuitous and lengthened route of wading through the islets of the Araxes to enjoy their beauty.

The Russian General BARON RENNENKAMPFF came to take leave of our party next morning as early as the day dawned. • KHOSROU MIRZA presented him with a bag containing twelve hundred ducats and two pair of handsome Cashmere shawls. The Baron's polite attentions to the whole suite were unremitting throughout: he was very desirous of crossing the boundary line, and of accompanying us to the court of His Royal Highness ABBAS MIRZA, that he might have formed the acquaintance of our highly respected envoy, Colonel MACDONALD KINNIER; but the orders of the Emperor NICHOLAS were so positive, that he could not even transport the Prince's carriage across *the river*. His fear, also, of being thought more favourable to the Persians, than to his own employers, was excessive. Born a Livonian, he was eyed with jealousy by his inferiors in rank, who, if any opportunity served, would doubtless have endeavored to injure his good name and interest with the Government. On pressing my hand he said, "The Emperor has every confidence in me at present, and I must endeavour to retain it; the Russians hate all my countrymen most cordially, because some of us hold the best appointments in the Empire."

(*To be continued.*)

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V.—*Supplement to the Historical Remarks on the Allahabád Inscription,*  
No. 2. *By the Rev. W. H. MILL, D. D. &c.*

In enumerating the few historical names that remain of the dynasty or dynasties to which I conceive that the Allahabád Inscription, No. 2 may possibly belong, I confined myself to such as are authenticated by ancient testimony: in which I am not aware of any omission except that of two kings, whom the researches of Professor WILSON have supplied: viz. SÁHASANKA, who appears from the *Visva Prakása* to have reigned at Canouje somewhere in the tenth century: and KORA, so called by the Mahometan writers, who was contemporary with MAHMÚD GHAZNAVÍ in the eleventh\*. It is however scarcely pardonable to omit all reference to a series of names with which so indefatigable an investigator as Colonel TOD thinks he has filled the chasm in question, in that most valuable and elaborate contribution to oriental and general literature, the

\* To these I might add the name of VIRA-SINHA-DEVA, who is said, at a period somewhat earlier, to have granted to the request of A'DISÚRA, king of Bengal, the five orders of Cányacubja Brahmans, from whom the present brahmans of Bengal are descended.

“Annals and Antiquities of Rájasthán.” The Annals of Marwar contained in his last volume, might well indeed be expected to throw some light upon this subject: since it was by the remains of the Rahtore family that last reigned at Canouje, by two grandsons of the unfortunate JAYA CHANDRA, that this still subsisting principality of the solar race was fixed in Central India, near the beginning of the 13th century, and escaped for several ages the notice of the Musulman princes that had subverted the ancient Hindu monarchies of the north. The professed records of the earlier periods of the family yet remain in the hands of the bards and other dependents of these princes at Marwar: and these traditional legends always deserve attention, though they cannot for various reasons command historical belief.

These chronicles all connect in a loose manner the solar race in the person of SUMITRA (about the sixtieth from RÁMA), the last prince of Ayodhya mentioned in the Puránas, with the sovereignty of the Rahtore family at Cányacubja—thence proceeding hastily to the defeat and death of JAY CHAND or JAYA CHANDRA, and the flight of his grandsons SEOJI and SATRAM to Marwar;—after which, they begin to wear the appearance of circumstantial history. Some of them however assume an aspect of chronological definiteness at the period of NAYN PAL (NAYANA PÁLA,) whom they represent as having conquered Canouje in the year of VICRAMÁDITYA 526, or A. D. 470, from king AJIPÁLA, a descendant of AJAMIDHA, of the Lunar race, which race they represent as having held the sovereignty of Cányacubja or Gádhipura, from the fabulous times of GÁDHI, father of VISVAMITRA, to whom its foundation is generally ascribed, down to this comparatively recent period. From this NAYN PAL, the Marwar chroniclers give a genealogical series of twenty generations to the unfortunate JAYA CHANDRA, thus filling the interval from A. D. 470 to 1193. Some observed incongruities in the testimony on which this series is given have not prevented Colonel TOD from attaching to the former date, and to the whole genealogy, a credit which he does not appear to give to any names preceding NAYN PAL in the same genealogical rolls. He takes it for established fact that the Rahtore family thus reigned for seven centuries at Canouje, and that this was the only principality of the solar race that ever occupied that ancient seat of Hindu empire.

The exhibition of this genealogy, as given by Colonel TOD, side by side with the testimony of indubitable Sanscrit monuments brought to light by COLEBROOKE, FELL, and WILSON, as to the actual reign of the Rahtore princes at Canouje, will bring to the test these assertions of the bards and panegyrists of the royal house at Marwar. It will be seen that it needs not the absence of the names of YASOVARMAN and

SÁHASANKA (who certainly reigned at Canouje within the limits of these seven centuries), to prove this genealogy destitute of all historical authority.

Colonel Tod's Rajasthan. Vol. ii. pp. 5, 6, 7.	Inscriptions published in the Asiatic Researches, vols. ix. and xv.
NAYANA-PALA conqueror of Canouje— A. D. 470. and thence surnamed Camu-dhvaga, with all his descendants who follow.	
PADARATA or BHARATA, his son, king of Canouje.	
PUNJA, do. do.	
-----	
DHARMA-BHUMBO, do. do. whose 12 brothers were also founders of great Rajput families.	
AJI-CHANDRA, do. do.	
UDAYA-CHANDRA, do. do.	
NRIPATI, do. do.	
KENAKA-SÉNA, do. do.	
SAHASRA-SÁLA, do. do.	
MÉGHA-SÉNA, do. do.	
VÍRA-BHADRA, do. do.	
DÉVA-SÉNA, do. do.	
VIMALA-SÉNA, do. do.	YASOVIGRAHA, or SRÍ-PALA, whose SON
DÁNA-SÉNA, do. do.	MAHI-CHANDRA, was father of
MUKUNDA, do. do.	CHANDRA-DÉVA, who became A. D. by conquest king of Ca- nouje about 1072.
BHUDU ? do. do.	MADANA-PÁLA, his son, who succeeded, 1096.
RÁJA-SÉNA, do. do.	GOVINDA-CHANDRA, do. do. 1120.
TRIPALA, do. do.	VIJAYA-CHANDRA, do. do. 1144.
SRÍ PUNGA, do. do.	JAYA-CHANDRA, do. do. 1160.
VIJAYA-CHANDRA, do. do.	
JAYA-CHANDRA, do. do.	

Hence it appears, that the Marwar authorities are correct only as to the unfortunate JAYA CHANDRA, who died A. D. 1193, and his father



VIJAYA CHANDRA, who died in 1168. Respecting all his ancestors they are altogether wrong, and have expanded into seven centuries a dynasty which lasted but 120 years ; for the same inscription which relates the conquest of CHANDRA DÉVA is utterly silent as to the crown of Canouje having been his by right of hereditary descent from NAYANA PALA, or any other. We have therefore little reason to credit the Marwar chroniclers in the other part of their statement ; viz. that this Rahtore dynasty thus reduced to one century, was the first and only dynasty of the solar race at Canouje. It is far more probable that princes of purer descent than they (whom Colonel Tod suspects on very probable grounds to be of partly Scythian origin) occupied that seat of empire from a period at least as early as that named by their chroniclers, viz. in the fifth century, or perhaps long before it. To some of these the kings mentioned in our inscription may have belonged, whom these authorities, if admitted as true, would exclude altogether.

A greater assistance might perhaps be obtained from Colonel Tod, had he given us the Jain inscription to which he alludes in pp. 140 and 211 of the first volume of the Transactions of the Royal Asiatic Society, as written in an ancient character (very probably that of our inscription) long disused in India, but known to the Jain hierarchs, and of which he promises to the Society a key. For this inscription relates to a certain *Avanti Rája* or Lord of Ujjayini, called CHANDRAGUPTA, and is dated in the year 427\*, which if applied to the era of the great monarch of that city VICRAMÁDITYA will be A. D. 371, but if applied to the Jain era of MAHÁVIRA will be B. C. 106. But the localities specified in the Allahabad pillar all seem to indicate a Gangetic kingdom rather than one whose centre is at Oujein.

In the line of the Chohan princes of Ajmeir, closed by the name of the heroic PRITHU-RAI, (who possessed himself in the 12th century of the ancient kingdom of Indrapristha or Dehli, only to be the last Hindu prince that ever reigned there) we find a CHANDRAGUPTA, son of MAHÁSINHÁ and grandson of MÁNIKYA-RÁI, the latter a king of some celebrity, whose date is fixed to A. D. 695. But the mention of these names, together with that of the son and successor in the kingdom, which is not SAMUDRAGUPTA but PRATÁPA-SINHA, is alone sufficient to remove all idea of this being the CHANDRAGUPTA of our inscription ; even without recurring to the decisive reason, that the *Agnikula* class of Xatriyas, to which this Chauhána family belongs, is ex-

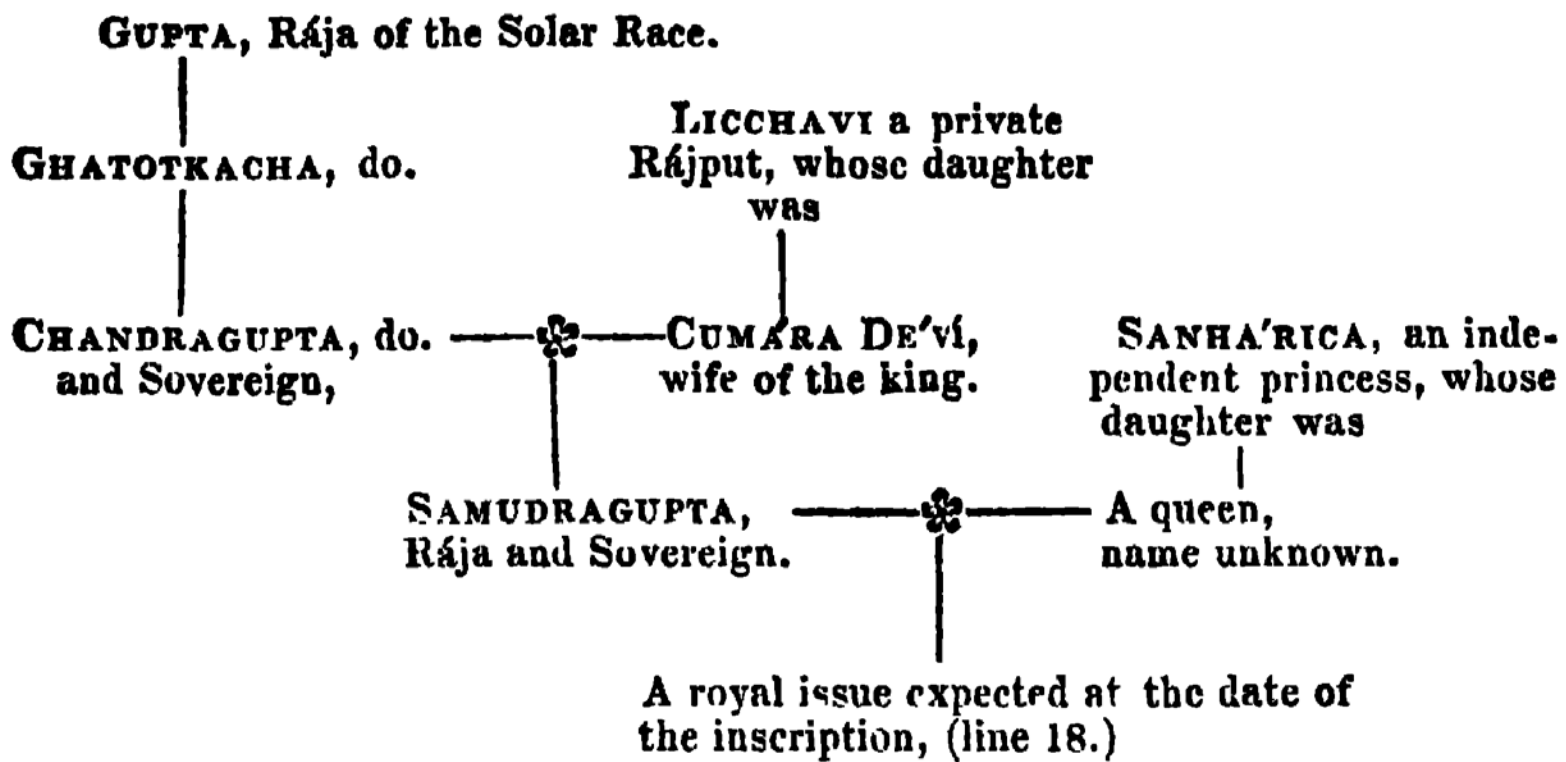
\* On the second mention Colonel Tod, apparently from inadvertency, makes the date of this same monument 466, i. e. 39 years later than before.

cluded as completely as the Lunar race from the character here assigned, of "children of the Sun." The last reason excludes also a more ancient CHANDRAGUPTA who, as Colonel TOD informs us, stands before MÁNIKYA-RÁI, in the long line, (which he has not published) of the Chohans' descent from their remote ancestor AGNI-PÁLA : though this prince, if real, may very possibly be the Lord of Oujein who is the subject of the Jain inscription already alluded to, (T. R. A. S. vol. i. p. 140.)

The same reason prevents us from profiting by another tradition often repeated by the same learned inquirer, both in his Annals of Rájasthán and his contributions to the R. A. S. Transactions, relating to another celebrated branch of the Agni-kula Xatriyas, the Pramaras. One tribe of this Rájput race, the *Mori*, is in the habit at this day of claiming for their own the celebrated CHANDRAGUPTA *Maurya*, founder of the dynasty so called at Palibothra in the days of SELEUCUS NICATOR. The account given by all the ancient Sanscrit authorities of the origin of that name is very different from this, viz. that it is the patronymic noun derived from the Sudra damsel MURÁ, of whom the king NANDA MAHÁPADMA became enamoured (being himself also of half-blood, the offspring of the Lunar prince MAHÁNANDA by a slave girl), and thus became the father of CHANDRAGUPTA, who afterwards succeeded by extirpating, with the Machiavelian Brahman's aid, his nine more legitimate brethren. This account is so universal—and it is so visible also even in the inverted accounts preserved by DIODORUS SICULUS, TROGUS POMPEIUS, and others in the west, (making SANDRACOTTUS the offspring of a queen and a barber, instead of a king and a barber's daughter) that it requires no ordinary attachment to the later chroniclers of Rájasthán to set aside these statements by making this king a member of a noble tribe of the purest Rájputs, to make him consequently unconnected altogether with those NANDAS whom he succeeded or displaced—and even to suspect the word *Maurya*, (as Colonel TOD does, T. R. A. S. i. 211,) to be an interpolation for *Mori*. There may however be a CHANDRAGUPTA to which such a tradition points with partial truth ; and such I should have suspected to be the conquering CHANDRAGUPTA of our column, but for the objection of family above stated.

Upon the whole, our researches for the subjects of this inscription in the records of Northern and Central India, seem to be hitherto unsuccessful, notwithstanding, the various CHANDRAGUPTAS that have appeared there. Of the name SAMUDRAGUPTA I have not yet seen any trace ; but to facilitate the progress of future inquiries, it may be use-

ful to exhibit synoptically the genealogical facts which the pillar supplies.



Another consideration, however, which should not be overlooked in this research, is the name of the contemporary king, mentioned in line 17 of the inscription, as having been overcome, together with several inferior princes, by SAMUDRAGUPTA. The king is called DHANANJAYA, and is described as of the race of UGRASÉNA, i. e. most probably the celebrated king of Mathura so called, the father of CANSA, who was slain by CRISHNA, and was, like his enemy, of the great lunar family of YADU. Now in inquiring who this king could be, the دھنجی DHANJYE or DHANANJAYA, who is mentioned by ABU'L FAZIL at the head of the royal lists of Malwa, as having founded a dynasty there about 2000 years before, should appear as much out of the question as the fabulous ARJUNA, who also bore the same name. Yet this prince, who in ABU'L FAZIL'S list (Ayin Acbery, vol. ii. p. 54,) has a SALIVÁHAN for his grandson—is identified by Colonel WILFORD, with a DHANANJAYA, mentioned in the royal lists of RA-GHUNÁTHA as having sprung from a temple in the peninsula of India, and thence attacked and slain a king named A'DITYA, and then reigned at Ujjayin: and on the strength of this last tradition, he is identified also with the great SALIVÁHANA himself, the founder of the era A. D. 78, because this latter is celebrated as the foe of and destroyer of the celebrated VICRAMÁDITYA! (See As. Res. vol. ix. pp. 134, 135, 140, 141.) The authorities from which the age, and family, and reign of this DHANANJAYA, might perhaps have been obtained, are so loosely cited by this very learned but fanciful writer, and so mixed up with his own evidently groundless and inconclusive deductions of identity, that we can derive no aid from them in determining whether he be the king mentioned on the column or not, or what could be thence safely concluded concerning the age of the inscription.

VI.—*On the Influence of the Moon on Atmospheric Phenomena.*

*By the Rev. R. EVEREST, M. G. S. M. A. S.*

Having observed one or two coincidences in the Meteorological Registers which I could not but deem remarkable, I was induced to examine them farther, in the hope of being able to furnish some rules which might be of use to those whose occupations are affected by atmospheric changes, such as the planter, the sea-farer, and others, and through them to the whole community. With this view, I have confined my observations to the chances of rain, that being the only uncertain condition in the bringing of our harvests to perfection ; of heat and sunshine there is no lack at any time. In pursuance of this object, I now beg to call your attention to

*The influence of the Moon in producing rain.*

Having remarked that a great proportion of the spring showers fell near the time of the new moon, I drew out a table of the quantity of rain that had fallen in the first four months of each year, for eight years, (which was as far back as I could obtain the registers,) showing at the same time what number of days it fell, before, or after, the day of new moon (see Table No. 1). From this it will appear that rain fell most abundantly on the 2nd, 5th, 6th, and 7th days before the new moon, and the 6th day after it, that, out of a sum total of 34,55 inches of rain, 25,31 inches fell within seven days from the day of new moon, and only 9,24 in the rest of the lunar period, being in the proportion of 2,73 : 1, for nearly equal portions of time. If we take the quantities that fell in each year they are as follows:

	Within 7 days of New Moon.	Beyond that period.
1825.....	1.82 .....	0.58
1827.....	1.62 .....	1.00
1828.....	0.16 .....	1.82
1829.....	1.72 .....	0.00
1830.....	6.48 .....	0.74
1831.....	5.55 .....	1.85
1832.....	4.86 .....	2.25
1833.....	3.10 .....	1.00
	<hr/>	<hr/>
Total, .....	25.31 .....	9.24

If instead of the quantities of rain we take the number of rainy days for the same periods, we have 45 rainy days against 23, being a ratio of nearly 2 : 1. For each year the quantities are—

	Within 7 days of New Moon.	Beyond that period.
1825 .....	8 .....	4
1827 .....	5 .....	3
1828 .....	1 .....	5
1829 .....	3 .....	0
1830 .....	9 .....	3
1831 .....	8 .....	4
1832 .....	6 .....	2
1833 .....	— 5 .....	2
	<hr/>	<hr/>
Total, .....	45 .....	23

Here the days of maxima are somewhat different from what they were before, being the 3rd, 5th, 6th, and 7th days before new moon, the day of new moon, and the first day after.

Upon examining further, I found that this excess of rain towards the new moon obtained in a degree through the succeeding months, May and June, but that the ratio was somewhat altered. For instance (see Table No. 2, of Calcutta year's rain), the rain that fell in the same days, about the new moon, during a period of eight years, amounted to 83.73 inches, and for the rest of the lunar period to 52.04 inches, being in the ratio of 1.6 : 1.0. The numbers of rainy days for the above two periods respectively were 68 and 54, in the proportion nearly of 1.3 : 1. If we particularize the quantities of rain, we find that the 3rd, 6th, 7th, and 8th days before the new moon are now become maxima, as well as the 3rd, 4th, 5th, and 6th, and 10th after it. In the third division of the year, which I have confined to the month of July, the numbers approach still more a ratio of equality, the respective quantities of rain being 43.60 inches and 28.78 inches, or in the ratio of about 1.5 : 1, and the numbers of the rainy days are very nearly equal, being 61 and 60, or in the ratio of 1.017 : 1. In the fourth division of the year, which I have made to comprehend the months August, September, and October, the ratio is altered, the quantities of rain for the two periods being 96.75 and 119.39 inches, or in the ratio nearly of 1 : 1.2, and the numbers of rainy days 159 and 173, being as 1 : 1.1 nearly. The different numbers are here placed, for the sake of comparison in a tabular form.

TABLE III.	Within 7 days of New Moon.	Rest of Lunar Period.	Ratio.
1st Division,.....	25.31 .....	9.24 .....	2.73 : 1.
2nd Ditto,.....	83.73 .....	52.04 .....	1.6 : 1.
3rd Ditto,.....	43.60 .....	28.78 .....	1.5 : 1.
4th Ditto,.....	96.75 .....	119.39 .....	1 : 1.2.
	<i>Number of Rainy Days.</i>		
1st Division,.....	45 .....	23 .....	2 : 1.
2nd Ditto,.....	68 .....	54 .....	1.3 : 1.
3rd Ditto,.....	61 .....	60 .....	1.017 : 1.
4th Ditto,.....	159 .....	173 .....	1 : 1.1.

Upon looking over the days of maxima in this last case, we find them to be the 3rd, 9th, and 11th, before the new moon, and the 3rd, 5th, 6th, 10th, 11th, and 12th, after. I must here observe, that the present mode of comparison is not strictly correct. As the lunar period is, properly speaking, only 29½ days, the fifteenth day on the left hand of the table only occurs alternately. The comparison, however, is sufficient for my purpose. Taking the four periods of the year together, the inequalities may be accounted for by supposing four days to be the principal maxima : one of these being the fifth day after the new moon, and another the 9th day before it. It is true that the 9th day itself is but once a maxi-

mum in the four periods. In the early part of the year, the days immediately succeeding it are maxima, and in the latter part of the year the days immediately preceding it. If therefore any cause can be assigned why the rain at one time should be a little retarded, and at another a little accelerated, there would be no error in supposing the maximum tendency to rain to occur on the 9th day. Two other days of maxima are the 3rd day before the new moon, and the 12th day after.

With a view of ascertaining whether the Barometer was similarly affected, I next put the heights of it at sunrise for five years into a similar table, and on taking the mean of the whole year, found that the fifth day after the new moon was the minimum. (See Table No. 3). My next object was to find whether the dew points varied in a similar manner, and I therefore reduced them from the wet-bulb indications in the registers, and those of Leslie's hygrometer preceding them. The method recommended in the 1st volume of GLEANINGS being too laborious to adopt, and Major OLIVER's tables in the GLEANINGS not having been published, I took the very simple method of multiplying the wet-bulb depression by 1.6, and subtracting the product from the temperature\*. I do not mean by saying so to recommend the operation as a general rule, but only that, where the whole difference between the temperature and dew-point does not amount to more than two or three degrees (as is usually the case at sunrise at Calcutta), and the temperatures are between 80 and 50, the errors will not be important. But another and greater difficulty still occurred to me, which was this. By a copious fall of rain the dew point is immediately lowered, so that on looking over the list of dew points on different days, the day of most moisture will appear to be the driest by its having the lowest dew-point. Thus, for instance, in May, 1830, they stood as follows :

Days of Month.	22nd,	23rd,	24th,	25th,	26th,	27th,	28th.
Dew-points at } sunrise,	72.9	78.2	74.9	75.1	75.6	74.9	77.9
Rain-fall,	—	—	0.10	3.00	4.22	—	—

Here the 25th and 26th were the days of the great storm, but looking at the dew-points alone, no indication is afforded of the quantity of moisture †. Unless, therefore, we could make due allowance for the rain-fall, the dew-points alone would be a very imperfect mode of judging

\* This rule would answer for an aqueous tension of 0.75 at the temperature of 90°. We think it would have been better to have used the aqueous tensions themselves, for which a table is given in the Gleanings, I. p. 81 and 340.—ED.

† When rain is accompanied with a strong wind, and that from the north, the air is seldom saturated with moisture ; the chief cause however for the fall of the dew-point is, the reduced temperature of the air during storms.—ED.

of the degree of moisture. For this reason I took only the first and last quarters of the year, when the weather is usually dry, and found the means of the different years (see table No. 4). From this it will be seen that the days of highest dew-point in the winter half of the year are the 4th and 5th, before the new moon, and the 10th and 11th, after. This was so near a coincidence with two of the maximum days of rain, (viz. the 3rd before, and the 12th, after,) that little doubt could be entertained of the one being caused by the other. That neither the other two days, (viz. the 9th, before, and the 5th, after,) were maxima might be accounted for by peculiar circumstances. At this stage of the inquiry I was led to attempt to account for the phenomena by the following considerations :

1st. By the united testimony of every observer, the quantity of moisture in the air and the rain-fall become less, as we recede from the great eastern ocean. Thus if we could obtain the mean dew-point for every degree of longitude between Delhi and Dacca, the result would exhibit almost as regular an increase as in a list of temperatures between London and Algiers. I was aware too of the great increase of dew-point here whenever the wind came from the east, and that a continuance of it was usually followed by rain. I could not, therefore, but believe that the force of attraction of the moon as well as of the sun excited an influence over the aërial currents either in modifying their direction or changing it entirely. Mr. DANIELL remarks the excess of dew-point when the wind blows from the Atlantic (he is speaking of the climate of England), and the force of attraction of the moon is stated by D'ALEMBERT to be such as would create a westerly current of eight feet in a second, (see ROBISON'S *Mechan. Phil.*) But to render this force more apparent, we must have recourse to another consideration.

2ndly. The principal cause by which the air is affected is by the heating power of the sun, which expands a column of it  $\frac{1}{180}$ th part for each degree of Fahrenheit. Upon the ocean the heat is counteracted by constant evaporation ; consequently, when a column of air, resting upon a surface of dry land, is heated by the sun, it becomes expanded, and of less specific gravity than an adjoining column in contact with the sea. Hence, as the heavier fluid will press upon and displace the lighter, a current flows in from the sea to the land. This diurnal phenomenon may be observed on almost every tropical coast. We have an annual instance of it in the great heats previous to the summer solstice, and the winds that follow them from every quarter of the ocean, the S. W. the S. E. and E., bringing with them abundant rain. This current must be strongest at the time of maximum heat of the day, and if we suppose

the moon in such a position as to act in conjunction with it, then the two forces would produce a great conjunction tide in the air. As the moon recedes eastward from the sun, it comes upon the meridian about  $48\frac{1}{2}$  minutes later every day; so if the change happened at noon exactly, three days after it would be upon the meridian at 2h. 25m. P. M. As the time of maximum heat of the day is by Dr. BREWSTER 2h. 40m. P. M. we ought on this day to have the great conjunction tide, according to theory. But in comparing the actual tides of the ocean with the deductions from theory, we find that the phenomena occur one day and a half later than they ought to do; thus the greatest spring tide does not happen exactly at the conjunction of the sun and moon, but a day and a half later. Let us make a similar allowance in the case we are considering; then as the moon must be somewhat more than three days old when it is upon the meridian at 2h. 40m. P. M. add one day and a half to its age, and the greatest tide will be produced when it is nearly five days old. I venture to suggest this as the cause of the maximum fall of rain on the fifth day after the new moon, and the minimum of the barometer on that day. Of course, as air is distended and rendered lighter by being mixed with aqueous vapour, the presence of a great quantity of moisture (which would be the case in a current setting in from the ocean) is sufficient to account for the diminution of pressure.

Cor. 1st. This supposition may account for our spring showers happening as they usually do between 2 and 6 P. M. and probably at the time when the superior or inferior tides of the moon are near the meridian.

Cor. 2nd. If the supposition be true, then the excess of rain about the fifth day after the new moon will be greatest, when the heat is a maximum, when the sun is nearest the zenith, and when the moon is nearest the zenith. This would happen at Calcutta in the months of May and June. In the first four months the heating power is great, but the sun has south declination for most part of the time, and the moon too. In July the sun is near the zenith, and so is the moon, but the heating power is counteracted by constant evaporation. In the last three months of the rains the sun and moon are further from the zenith, and the heating power somewhat less than in July. I took therefore the sum of the rain that fell on the 3rd, 4th, 5th, 6th, and 7th days after the new moon, in each of the four periods, and compared each with the quantity that fell during the whole lunar period. Premising then that five days are to the whole lunar period as 10 : 59 I found the sum of rain that had fallen in the 5 days above mentioned, to be to the sum of the whole lunar period,—



In the 1st four months,.....	::	10	:	52
In May and June,.....	::	10	:	36
In July,.....	::	10	:	46
In Aug., Sept., Oct.,.....	::	10	:	51

But besides the superior or direct tide of the moon, the inferior or opposition tide of the moon would be in conjunction with the greatest heat about the 9th day before the new moon. I took therefore the 9th day with three days before and three days after it, and found the proportions the sums bore to the whole period in the same manner as above.

Seven days being to the whole lunar period,	::	10	:	42
The proportion was—				
In the 1st four months, .....	::	10	:	40
May and June,.....	::	10	:	40
July,.....	::	10	:	55
Aug., Sept., Oct.,.....	::	10	:	40

The irregularity in the case of July probably arises from a sufficient series of years not having been taken. If instead of the quantities of rain we take the number of rainy days in the same periods, they give a ratio of 10 : 40

With a view of ascertaining whether similar results were to be observed in the climate of Great Britain, I next made a table of the temperature at Edinburgh, for eight years, (from 1824 to 1831, both inclusive,) from the Edinburgh Philosophical Journal; to this I added a table for three years near London, (from Sept. 1819 to Sept. 1822,) which is to be found in DANIELL'S Meteorological Essays, and the results are as follows: (see table No. 5;) taking the days as before, (viz. the 5th day after the new moon, and two days before and two days after it,) the ratio to the whole lunar period was as follows:

In the first four months, .....	::	10	:	46
May, June, July, }	::	10	:	50
Aug., and Sept., }	::	10	:	50
Oct., Nov., Dec.,.....	::	10	:	70

It was to be supposed that in a high northern latitude, in the three last months of the year, when the heating power of the sun is very small, owing to the great moisture, and also the sun and moon (when it is near the change) have southern declination, that the joint effect of the heat and attractive force would be barely perceptible. There is, however, another cause of mistake. Though the mean time of maximum heat for the whole year is 2h. 40m. p. m. yet that time varies with the different seasons; in summer it is considerably later, in winter it is considerably earlier. I have not the book to refer to, but taking the 6th day in the summer months for the centre of the maxima, instead of the fifth, after the new moon, and the 2nd instead of the 5th for the last quarter, the ratios are as follows:

In the summer months .....	::	10	:	47
Oct., Nov., Dec.,.....	::	10	:	58

Let us next compare the day of the moon's opposition, (viz. the 9th before the new moon,) and three days before and three days after, as was done in the former case.

The ratio of the amount to the whole lunar period was

In the first four months, . . . . .	:	:	10	:	40
Summer months, . . . . .	:	:	10	:	16
Oct., Nov., Dec., . . . . .	:	:	10	:	37

But taking the 13th before, instead of the 9th, (for the last quarter,) we get a ratio of . . . . . : : 10 : 28

We may observe then that the amount which falls in these days near the full moon is greatest in winter, when the moon near the full has north declination. On the contrary, in summer, the amount which falls near the new moon, when the moon at that season, and that age, has north declination, is the greatest. We may recollect that in the theory of the tides the height of the tide is said to vary as  $\cos^2 x$  (where  $x$  is the angular distance between the moon and zenith of the place). The above observations seem to point to a law somewhat similar. But of this I have yet to offer some further probability. I have not here compared the number of rainy days as well as the quantities of rain fallen, but they tend to the same conclusions, though less decisively. Nor have I said any thing respecting the two other maxima on the 3rd day before, and 12th after, the new moon, as I have no probable cause to allege for them.

Let us then dismiss from our minds the idea of a sphere covered with a homogeneous fluid, and substitute that of a surface partly of dry land, and partly of water, the first covered with a stratum of air nearly dry, the last with a stratum saturated with moisture; and to carry on the comparison with the tides of the ocean, let us remember that we cannot measure the actual height of the tide, as in that case, but that if an observer, situated on the border of an estuary, were to endeavour to estimate the relative intensity of the currents flowing in from the open sea, by the quantity of salt contained in the water before him, then his case would be somewhat similar to ours, when we attempt to draw a like reference respecting the aerial currents from the heights of the dew-point. If he were to endeavour to conjecture the force of the floods from the country above, by measuring the quantity of earthy matter precipitated from the water, then he might expect to approximate to the truth about as much as we do when we attempt to infer the force of the current of air flowing in from the regions of the ocean, by the quantity of water precipitated. In both cases an approximation only can be expected.

Having gone thus far, the next step to be desired was to make a comparison between the heights of the dew-points at different ages of

the moon, and the heights of the tides of the ocean on the same days. The only table I could refer to was that given us by Mr. NOTON, (*Jour. As. Soc.* May, 1833,) of the tides in Bombay harbour, which answered tolerably well, as Bombay, as well as Calcutta, has considerable north latitude. The heights of the tides, day and night, both at change and full, are given there, as well as for three days after, and three days before, the day of change and full. I took, therefore, the average height of the tides in the seven days about each new and full moon, and compared them together. The first comparison was the day (or superior) tide of the new moon, and the day or inferior tide of the full moon. It was as follows :

New Moon,		Full Moon,		Ratio of day tide, New Moon, to night tide, Full Moo								
ft.	in.	ft.	in.	ft.	in.							
12	11	Feb.	2.	..	15 2 Jan. 17.	12	11	:	17	0		
13	5	March	2.	..	15 1 Feb. 16.	13	5	:	16	1		
14	3	April	1.	..	15 March 16.	11	3	:	16	0		
*	15	3	April	30.	..	14 5 April 15.	*	15	3	:	15	4
15	9	May	30.	..	14 5 May 14.	15	9	:	13	10		
16	5	June	28.	..	15 3 June 13.	16	5	:	14	1		
16	5	July	27.	..	14 3 July 13.	16	5	:	12	9		
16	1	Aug.	26.	..	14 6 Aug. 11.	16	1	:	13	0		
15	6	Sept.	24.	..	14 5 Sept. 11.	15	6	:	13	1		
14	11	Oct.	24.	..	14 3 Oct. 10.	14	11	:	13	11		
*	14	3	Nov.	22.	..	14 3 Nov. 8.	*	14	3	:	15	
13	3	Dec.	22.	..	14 4 Dec. 8.	13	3	:	15	10		

It will be observed, that in the winter season, when the new moon has great southern declination, and the full moon has great northern declination, (or, in other words,) comes near the zenith of the place in question (Bombay), then the new-moon tide is not so high as the full-moon tide ; but, in the summer season, when the declinations are reversed, then are the ratios of the tides reversed also. I have marked with an asterisk the places where the ratios change. But we must here notice a remarkable anomaly in the lunar theory. The ratios we have observed above ought only to hold with direct or superior tides of both new and full moon, the reverse ought to hold with respect to the inferior tides of both. For instance, if the declination of the moon were 20° south, and consequently the vertex of her superior tide in 20° south latitude, the vertex of the inferior or opposite tide ought to be in 20° north latitude. So that in places to the north of the equator, as Bombay and Calcutta, the inferior tide would be very large when the superior tide was very small. Thus at Bombay, in winter, the night, or inferior tide, of new moon, ought to be very large ; the day, or inferior tide, of full moon, very small : but on comparing them together, we find the reverse.

New Moon, Night.		Full Moon, Day.	
ft.	in.	ft.	in.
14	6	15	2
14	2	15	1
14	8	15	0
14	3	14	5
14	6	14	5
14	5	15	3
14	5	14	3
14	8	14	6
14	6	14	5
15	5	14	3
15	6	14	3
15	3	14	4

I have noticed this because, by supposing a similar anomaly in the case of the tides of the air, we may explain why the ninth day before new moon has a less proportionate rain-fall in summer, (when the moon at that age has usually south declination,) than it has in winter, when the moon at that age has north declination; and vice versâ, why the fifth day after new moon has a greater excess of rain-fall in summer, when its moon has north declination, than in winter, when its moon has south declination. Were the lunar theory correct, the excess in one tide, owing to the moon's declination, would be compensated by the defect in the opposite tide. Similar anomalies commonly prevail. Thus we read, "At Brest when the moon has great declination the superior tide may be three times greater than the succeeding, or inferior tide; but the fact is, they differ very little. M. LA PLACE says, they do not differ at all."—(Mechan. Philos. iii. 365.) But to return to the matter before us. Having made out a table of the dew-points at Calcutta for 1832, I selected the heights of the same days as are stated in Mr. NOTON's paper of the Bombay tides, and took the average in the same way. Comparing the times of new and full, the numbers were

New.	Full.
53.1	46.3
54.3	62.1
66.8	59.2
74.5	72.9
78.1	77.6
77.5	74.9
77.6	76.2
77.3	77.0
75.3	76.4
73.2	74.5
58.8	64.3
51.5	58.0

But as the heating power of the sun (as the year advances) must affect the current of air, and consequently the dew-points, whereas the tides of the sea are affected wholly by the attractive forces of the sun and moon, no correct comparison can be drawn between them. Thus the first item under "Full" is 46·3, which is less than the item under "New," 53·1. But it may be said, that the time of the average 46·3, is near 15 days earlier than that of the corresponding average 53·1; that as the dew-points increase with the year from January to June, owing to the heat principally, the item under "Full" (46·3) is less than that under "New" (53·1), owing to its being so much earlier, and consequently less affected by the heat of the sun. To obviate this difficulty, we may remark that, if the first item under "Full" is 15 days earlier than that under "New," the next item below it (62·1) is fifteen days later; the mean between them therefore would correct any discrepancy arising from increase or decrease of heat in either case.

Proceeding in this manner, i. e. taking the mean of each number in succession with the one below it, in the column headed "Full," the comparison becomes as follows. I have placed the Bombay tides of the same period in the same line, that the agreement may be more apparent.

Dew-points, Calcutta.		Tides, in Bombay Harbour.			
New moon.	Full moon.	New (Day).		Full (Night).	
		ft.	in.	ft.	in.
53·1 .....	54·2	12	11	17	0
54·3 .....	60·7	13	5	16	1
66·8 .....	66·1	14	3	16	0
*71·5 .....	75·2	*15	3	15	4
78·1 .....	76·2	15	9	13	10
77·5 .....	75·5	16	5	11	1
77·6 .....	76·6	16	5	12	9
77·3 .....	76·7	16	1	13	0
75·3 .....	75·4	15	6	13	1
*73·2 .....	69·4	11	11	13	11
58·8 .....	61·9	*14	3	15	0
51·5 .....	52·2	13	3	15	10

Disclaiming then the wish of speaking positively on a subject where no decisive proof has been adduced, we may yet be allowed to assert, as exceedingly probable, that the dew-points, upon the whole, vary with the declination of the moon, and in the same manner as the tides of the sea do.

I have been induced to publish the above remarks from having seen a popular notice of M. ARAGO's paper on lunar influence. One of the first remarks is, that the number of rainy days is increased by the moon's perigee. The number of rainy days in apogee being to those in perigee : : 1069 : 1169. This would agree very well with the notion of

the atmospheric currents being acted on by the attractive force of the moon\*. The barometer is next alluded to, but the circumstance of the specific gravity of air being diminished by its being mixed with aqueous vapour, must tend to render very uncertain any deductions from inequalities of pressure alone.

Medical men will be able to judge, whether the recurrence of a very high dew-point, or in other words, of great moisture, at certain fixed days in the lunar period, is sufficient to account for the recurrence of certain diseases, in the manner they have been observed to do since the earliest ages. I have now merely to add the several tables alluded to in the text, of rain-falls, dew-points, and barometric heights.

I subjoin a table of the most remarkable storms and falls of rain, which, whatever may be thought of the theoretical suggestions, I hope will be of use.

[We put every confidence in the tables and in the abstracts of them drawn up by our correspondent, but we regret that in calculating some of them he should have selected those columns of the meteorological registers, which were perhaps the most liable to irregularities. At the hour of sunrise, for instance, the mercury of the barometer is in motion : the chance of punctuality in the observer is less (we allude here to the registers of the Surveyor General's Office, where the observer did not reside on the premises) ;—and the light for reading off is bad. Again, at that hour the depression of the wet bulb thermometer is at a minimum, and least trust-worthy for shewing the hygrometric effects of aerial currents, which are also at that hour generally lulled and quiescent. The aqueous tension calculated from the depressions, or if that be too troublesome, the indications of the hair hygrometer, which is not affected by heat, would best answer the purpose desired. But we would venture to suggest that the barometer alone is sufficient, particularly if observed at its hours of rest, its maximum or minimum at 10 A. M. or 4 P. M. to point out the lunar influence if perceptible, on the atmosphere : for its indications are alike affected by the direction of the aerial currents, the moisture present, and the diminution of gravity :—besides which its march in other respects is so regular in these latitudes, that upon a long series of averages very small anomalies ought to be discoverable. It will be seen, from the proceedings of the Asiatic Society on the 2nd July, that M. ARAGO has applied through the French Government for copies of all meteorological registers kept in Calcutta, probably with a view of solving this very question of lunar influence :—The registers have been furnished, and we shall take care to add a copy of the present laborious and useful analysis.—ED.]

\* Rain falls most abundantly about the second octant, which also agrees with our selection of the fifth day after as a maximum.

TABLE

shewing the quantity of Rain that has fallen in the first four months of each

○ *Before New Moon.*

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
*1825,	.....	.....	.....	.....	0.04	.....	0.08	..	0.08	.....	.....	.....	0.02	.....	.....
1827,	0.02	.....	0.30	.....	.....	.....	.....	.....	.....	.....	.....	0.04	0.46	.....	.....
1828,	.....	.....	.....	.....	.....	1.08	0.10	.....	.....	.....	.....	.....	0.16	.....	.....
1829,	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.40	0.07	.....	.....	.....	.....
1830,	.....	.....	.....	.....	.....	.....	.....	.....	.....	0.04	0.96	.....	.....	2.50	.....
1831,	.....	.....	.....	0.25	.....	.....	.....	.....	.....	.....	1.80	0.30	0.37	0.38	.....
1832,	.....	1.65	.....	.....	.....	.....	0.60	..	0.60	1.71	1.32	.....	.....	.....	0.55
1833,	.....	.....	0.10	.....	.....	.....	.....	.....	1.36	1.30	.....	.....	0.14	.....	.....
Total,	0.02	1.65	0.40	0.25	0.04	1.08	0.78	..	1.96	4.45	4.15	0.34	1.15	2.88	0.55

Number of Rainy Days

1825,	.....	.....	.....	.....	1	.....	1	..	1	.....	.....	.....	1	.....	.....
1827,	1	.....	1	.....	.....	.....	.....	.....	.....	.....	.....	1	2	.....	.....
1828,	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	1	.....	.....
1829,	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....
1830,	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	2	.....	.....	1	.....
1831,	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	1	1	1	1	.....
1832,	.....	1	.....	.....	.....	.....	1	..	1	2	1	.....	.....	.....	1
1833,	.....	.....	.....	1	.....	.....	.....	.....	2	1	.....	.....	1	.....	.....
Total,	1	1	1	2	1	1	3	0	4	5	5	2	6	1	1

\* Only the first three months of 1825 are set down.

TABLE

Shewing the quantity of Rain which fell in each season of the

○ *Before New Moon.*

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Ist 4 months,	0.02	1.65	0.40	0.25	0.04	1.08	0.78	..	1.96	4.45	4.15	0.34	1.15	2.88	0.55
May & June, ..	1.78	1.53	5.41	4.24	1.63	3.18	1.71	7.04	7.22	6.76	2.30	5.54	8.61	1.08	4.97
July, ..	1.88	1.37	2.52	0.77	3.13	0.66	0.53	1.34	3.59	2.81	2.44	0.30	5.67	1.10	4.22
Aug. } Sept. } Oct. }	1.91	6.55	5.26	7.33	9.40	6.60	10.20	6.22	6.84	5.95	4.53	5.12	10.27	2.47	2.05

Number of Rainy Days

Ist 4 months,	1	1	2	1	1	1	*	0	*	*	*	2	*	1	1
May & June, ..	2	5	5	6	6	5	4	6	7	5	4	8	6	3	4
July, ..	3	4	5	3	6	5	2	4	5	5	4	3	5	2	*
Aug. } Sept. } Oct. }	5	10	12	11	13	14	11	10	8	9	10	12	13	8	8

NOTE.—The days of maxima are marked with an asterisk, that they may meet the period, but not such as to invalidate the results.

No. 1.

year for eight years ; and the distance of it from the day of New Moon.

After New Moon.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
.10	0.10	0.90	0.60	.....	0.02	.....	.....	.....	.....	.....	.....	0.40	0.06	...
.....	0.12	0.14	.....	0.92	.....	.....	.....	.....	.....	0.68	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	0.25	.....	.....	.....	.....	0.14	.....	0.15	0.35
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0.08	0.30	.....	.....	0.44	0.16	2.00	.....	.....	0.08	0.36	.....	0.30	.....	.....
0.45	0.05	.....	.....	.....	.....	2.20	.....	.....	0.76	0.51	.....	0.30	.....	.....
0.68	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
0.30	.....	.....	.....	.....	.....	.....	.....	0.90	.....	.....	.....	.....	.....	.....
1.61	0.57	1.04	0.60	1.36	0.18	4.45	..	0.90	0.81	1.58	0.14	1.00	0.21	0.35

in the same period.

2	1	1	1	.....	1	.....	.....	.....	.....	.....	.....	1	1	.....
.....	1	1	.....	1	.....	.....	.....	.....	.....	1	.....	.....	.....	.....
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	.....	1	1
.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....	.....	.....
1	1	.....	.....	1	1	1	.....	.....	1	1	.....	1	.....	.....
2	1	.....	.....	.....	.....	1	.....	.....	1	1	.....	1	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
1	.....	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
7	4	2	1	2	2	3	..	1	2	3	1	3	2	1

No. 2.

year in Calcutta, and their distances from the day of New Moon.

After New Moon.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1.61	0.57	1.04	0.60	1.36	0.18	4.45	..	0.90	0.81	1.58	0.14	1.00	0.21	0.35
2.08	4.03	3.40	9.98	7.87	8.36	6.72	4.81	3.91	1.10	7.26	1.39	5.02	1.50	5.34
3.38	1.60	2.58	0.59	4.10	5.24	0.98	4.80	2.56	3.86	2.71	0.50	0.66	4.43	1.46
3.52	7.11	6.83	12.62	5.53	9.47	8.13	6.31	7.51	6.61	12.68	11.07	11.98	9.64	6.43

in the same period.

*	*	2	1	2	2	*	.....	1	2	*	1	*	2	1
3	4	3	*	*	*	*	4	3	2	5	4	3	4	*
5	5	3	2	4	4	3	*	*	*	2	4	2	*	2
7	9	8	*	*	0	*	*	*	*	*	*	*	*	10

eye more readily. P. S. some incorrectness has since been discovered in the 4th



TABLE  
Shewing average height of Barometer at Calcutta,  
Before New Moon.

Years.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1827,	..	824	813	807	786	783	782	777	769	779	780	759	769	802	807
1829,	..	795	773	767	769	770	775	777	769	745	732	748	736	751	734
1830,	..	770	768	766	769	788	788	802	800	803	843	809	794	783	774
1831,	..	782	751	744	756	757	744	753	754	751	753	746	761	748	759
1832,	..	788	798	808	815	814	803	791	787	754	785	797	785	783	765
Mean,	..	792	781	778	779	782	778	780	776	766	779	772	769	773	768

TABLE

Shewing average Dew-points at Calcutta, for the first and last quarters

1st and last quarters.															
Years.	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1827,	..	66.8	61.0	60.8	59.7	58.7	60.2	62.	62.6	57.5	59.7	60.8	60.2	59.0	59.5
1828,	..	61.2	61.4	60.9	62.5	63.3	64.9	59.6	60.4	61.1	61.4	60.9	60.7	59.9	60.7
1829,	..	63.1	61.9	62.3	63.7	62.4	61.8	61.8	63.2	63.5	65.7	64.6	62.0	63.7	64.1
1830,	..	62.5	63.7	62.9	63.9	61.1	61.8	61.9	61.8	64.3	61.7	65.0	64.8	66.7	65.0
1831,	..	60.3	60.3	60.3	60.2	62.4	62.5	64.5	65.3	66.1	65.2	64.1	65.7	65.2	63.9
1832,	..	61.7	60.5	61.	60.5	61.	59.9	60.1	58.6	61.0	62.2	59.8	59.8	58.4	59.8
1833,	..	66.5	67.1	66.5	64.6	61.7	65.7	65.	63.2	65.7	65.2	65.9	61.2	63.4	64.2
Mean,	..	63.1	62.3	62.1	62.1	61.5	62.4	62.1	62.1	62.7	63.4	63.0	62.5	62.3	62.5

TABLE

Shewing quantity of Rain fallen near London, from Sept. 1819, to Sept. 1822,

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1st 4 months,	0.73	1.25	2.47	2.91	0.97	1.54	2.51	1.92	2.23	2.02	1.48	1.16	1.86	3.61	2.43
Five summer months,	1.04	3.96	4.74	4.55	2.69	4.16	3.35	3.23	2.43	4.87	2.93	3.28	2.64	5.87	5.95
Last 3 months,	3.51	1.72	5.45	2.28	2.72	2.74	3.44	1.62	3.26	2.95	2.05	3.35	1.58	1.52	2.36

No. of Rainy Days in

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1st 4 months,	4	11	15	14	9	11	14	14	14	15	14	14	13	17	14
Five summer months,	10	16	19	20	23	23	22	20	15	15	19	19	19	19	16
Last 3 months,	9	12	15	13	15	14	14	12	15	11	13	9	12	11	14

TABLE

Shewing the most remarkable Storms and Falls of Rain that

	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
1823,..	.....	.....	.....	.....	.....	.....	.....	1	2	.....	.....	3	.....	.....	.....
1826,..	.....	.....	.....	.....	16	.....	.....	7	8	.....	9	10	11	.....	.....
1827,..	.....	21	.....	.....	.....	.....	20	.....	.....	.....	.....	.....	.....	.....	.....
1828,..	.....	.....	.....	.....	.....	23	.....	.....	.....	.....	.....	.....	.....	.....	.....
1829,..	.....	.....	.....	32	.....	.....	.....	.....	.....	26	34	.....	29	37	.....
1830,..	.....	.....	.....	.....	41	.....	43	.....	.....	39	.....	.....	.....	35	40
1831,..	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	52	53	45
1832,..	.....	54	.....	.....	.....	.....	.....	.....	.....	55	56	.....	59	.....	.....
1833,..	.....	.....	.....	.....	.....	.....	.....	.....	.....	66	.....	62	.....	.....	.....

1. 2.68 in. rain, Sept. 25—2. 4.60 do. Sept. 26—3. 2.14 do. Aug. 2—4. 3.32 do. only months of 1823, of which the Registers are to be found)—7. 4.06 in. rain, May 9—13. 2.06 July 13—14. 4.48 June 15—15. 2.36 Aug. 4—16. 3.66 Sept. 20—17. 4.40 5.40 Sept. 20—23. 1.08 Jan. 6—24. 2.20 Oct. 14—25 3.04 Oct. 16—26. April 26, 1.4 wind—30. 6.29 June 28—31 2.25 July 5—32. 2.05 Aug. 16—33. 4.60 Sept. 29—29. 4.22 and do. May 26—32. 2.80 May 15—40. 2.15 June 19—38. 2.90 June 25—41. 2.20 288 June 13—47. 305 June 14—48. 285 June 18 49. 2.00 June 20—95. 252 July 8—48 and Nov. 1—54. 1.65 Feb. 11—55. 1.18 March 26—56. 1.32 March 27—57 2.63. Aug. 7—60. 165 and do. Oct. 8—61. 146 Nov. 1—6.200 May 15—63 May 21, 2.90 and hea- 13—67. 2.34 Dec. 21. Note—Where two numbers have been used in the same place

No. 3.

at sun-rise, on every day of the Moon's age.

After New Moon.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
794	779	779	757	759	758	754	751	781	769	777	789	806	810	816
750	737	750	758	761	741	805	783	788	808	794	787	812	807	785
779	758	754	768	739	713	768	773	802	781	789	784	784	776	784
772	782	779	787	794	790	800	785	785	786	786	802	809	823	816
756	749	752	752	753	757	759	776	779	790	794	789	777	772	785
770	761	763	764	761	752*	777	774	787	787	788	790	798	798	797

No. 4.

of the Year, with distance from New Moon (taken at sun-rise).

60.5	58.1	59.9	60.9	61.2	58.9	64.0	64.8	63.7	60.7	61.4	63.1	60.5	60.1	60.4
62.3	61.6	63.7	63.6	63.5	63.3	66.1	66.2	67.3	67.6	68.8	66.7	62.5	61.1	62.2
62.8	65.0	63.3	62.2	61.1	62.6	62.7	63.0	62.0	61.3	61.0	60.8	61.1	61.1	59.5
63.9	63.8	62.7	62.3	63.2	63.5	62.	61.7	60.6	63.4	61.5	62.2	62.5	61.9	63.1
62.6	63.7	61.4	62.6	62.5	61.1	62.2	62.4	62.9	61.1	67.2	65.9	61.4	65.7	62.5
58.4	58.7	59.5	59.8	61.8	58.5	58.9	57.5	60.9	60.2	58.	58.	59.1	59.3	59.1
64.0	67.0	65.6	64.3	62.1	63.6	62.6	64.	62.6	65.3	67	68.	67.8	67.0	65.7
62.1	62.5	62.3	62.2	62.2	61.6	62.6	62.8	62.9	63.2	63.5	63.5	62.5	62.3	61.8

No. 5.

inclusive, and at Edinburgh, from beginning of 1824, to end of 1831.

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
2.52	3.29	1.84	2.79	1.89	2.99	2.31	4.54	2.48	1.70	2.45	2.33	3.06	2.64	1.16
1.58	4.91	2.53	3.32	5.49	4.98	3.85	5.89	4.63	2.86	6.11	7.40	3.16	3.92	2.22
3.06	2.33	1.71	3.34	1.69	1.29	1.92	1.90	2.63	1.24	1.86	2.96	2.06	1.34	1.97

the same period.

12	16	13	12	12	15	11	12	13	12	12	16	18	17	9
19	22	16	16	19	23	22	23	27	16	25	23	19	19	18
15	12	12	13	5	10	11	12	14	11	9	14	10	14	9

No. 6.

have happened in Calcutta in the following years :

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14
.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	4	5	6	.....	.....
.....	15	.....	.....	.....	12	.....	.....	.....	13	14	.....	.....	.....	.....
22	.....	.....	.....	.....	.....	17	18	.....	.....	.....	19	.....	.....	.....
.....	.....	.....	.....	.....	.....	24	.....	.....	25	.....	.....	.....	.....	.....
.....	27	.....	33	.....	31	.....	.....	.....	.....	.....	.....	28	.....	.....
.....	.....	.....	.....	37	38	36	42	.....	.....	.....	.....	.....	.....	.....
.....	.....	.....	46	47	51	44	.....	48	.....	49	.....	.....	.....	50
.....	.....	.....	.....	.....	.....	.....	.....	61	.....	.....	.....	57	58	60
65	.....	63	64	.....	.....	.....	.....	.....	.....	67	.....	.....	.....	.....

Aug. 16.—5. 2.56 do. Aug. 17—6. 3.00 do. Aug. 18. (Note. Aug. and Sept. are the 28—8. 2.03 May 29—9. 2.16 June 30—10. 2.4 June 1—11. 2.26 July 1—12. 254 July June 29—11. 3.72 June 30—19. 4.45 Aug. 3—20. 202 Aug. 13—21. 3.58 Sept. 6—22. and strong wind 27. 2.18 June 2—28. hurricane and 3.55 June 13—29. 27, violent 3.30 Oct. 22—35. 2.50 April 20—36. 2.00 April 28—37. 3.00 and storm May 25—38. July 8—42 3.90 July 26—43. 2.03 Sept. 7—14. 2.20 April 18—45. 2.00 June 9—36. 2.10 Aug. 16—50. 3.12 Sept. 20—51. 2.35 Oct. 11—52. 53. storm and rain, Oct. 31 8—58. 3.00 Aug. 9—59 2.97 Aug. 23—57. 1.71 and storm Oct. 6—58. 354 and do. Oct. vy storm, 64 May 22 5.34 and do.—65 July 17. 2.14 6.3 2.0 Aug. 17—66. 2.28 Oct. the last is referred to with a dot over it, thus 48.

VII.—On the Measurement of the *Ilahy Guz*, of the Emperor Akber.

By W. CRACROFT, Esq.

[In a letter to the Editor.]

In the determination of the *Ilahy guz*, given in your useful tables with the June number of the Journal, I observe that Colonel HODGSON has deduced a length of 33.58 inches from the average measure of the marble slabs of the pavement of the Taj at Agra, and that other lengths which he has deduced from that building, vary from 32.54, to 35.8, a difference of 3.26 inches, or nearly one-tenth of the whole measure. Government having fixed 33 inches as an arbitrary value of the *Ilahy guz*, it is no longer an object of importance in point of practice to seek further for its original length; it may still however be a matter of curiosity, and as that deduced from my own measures of the marble slabs of the Taj, and other parts of the building, (made at the Colonel's request in 1826,) differs from his very much, I send you the detail of my measurement, which you can publish whenever more interesting matter be not at hand. I made use of a surveyor's measuring tape, the error of which I ascertained by marking off lengths of a well executed 2-feet brass scale, by WATKINS, on the terrace of a verandah, with a fine black-lead pencil, carefully covering the pencil marks at each division by the assistance of a magnifying lens, and obtained the following, taken off with hair compasses and measured on the diagonal scale.

	feet.	error of tape.	ft.	error.	ft.	error.
At	56	0.93	58	1.00	60	1.00
	57	0.95	59	.95	65	

All my longest measures, from 44 to 49 slabs, being within these numbers of feet, the error has been assumed at one inch in 60 feet, or 1.720 part of the whole; and is additive, the tape being too long, and giving the lengths less than they really were.

Measures on the east side of the Taj, Direction North and South.				South side of the Taj Direction East and West.				
	Slabs.	feet.	inches.		Slabs.	feet.	inches.	
	1	45	60	2.5	10	49	65	4.8
	2	45	60	1.5	11	49	64	1.8
	3	46	61	3.5	12	49	65	0.5
	4	44	58	7.3	13	49	65	0.2
	5	46	61	3.5	Direction N. and S.			
	Direction E. and W.			14	45	60	1.7	
	6	48	63	6.8	15	45	60	1.2
	7	48	63	8.2	16	45	60	2.0
	8	48	63	8.6	17	45	60	3.1
	9	49	65	2.9	18	45	60	1.2
In other parts of the pavements.								
	19	46	61	6.5	22	49	65	1.5
	20	49	65	0.6	23	49	65	2.0
	21	49	65	1.4	24	45	60	2.5

which give 1127 slabs, equal to feet 1501 00.8 in. of the tape, or adding its error, to 18036.8 inches, and the *Ilahy guz*, 32.012 inches.

To this length, however, it appears to me that a correction for the mortar should be applied, as it is more probable that the marble slabs were cut to half a guz, than laid down by that measure; and from various observations, I assume this quantity at 0.03 inch between each slab, or 0.06 inch. for the guz, leaving 31.952 inches for the deduced length. I am the more satisfied that this correction is necessary, from having observed in several places, larger slabs of marble laid down, with grooves cut in them to match the junctions of the small slabs, and at the end of all of which a space had been left and filled up with mortar, equivalent to the accumulated excess of length caused by the mortar between the slabs of half a guz, and proportional to their numbers. I measured some of the larger slabs, and found their lengths as follows :

	guz deduced from each stone	
	in.	in.
A stone of four guz, .....	128.4	32.2
A stone of two guz, .....	64.0	32.0
A square stone of 1 guz, .....	31.8	31.8
Another, .....	31.8	31.8

the average of the whole giving exactly 32.0 in the *Ilahy guz*.

Assuming then 32 inches to be a very near approximation to the real *Ilahy guz*, it is worthy of observation that almost every principal apartment, or part of the building, has been planned in an integral number of guz : thus each face of the inside of the principal octagon under the central dome is 24 feet = 288 inches, which is exactly equal to nine guz of 32 inches, and the north-east boorj on the river terrace is 16 feet in diameter = 192 inches = six guz of 32 inches. I am therefore of opinion, that the average length of the *Ilahy guz* was, at the time of the building of the Taj, as nearly as can be now ascertained, a minute fraction below 32 English inches.

The two first data, chosen by Mr. HALHED, viz. the measure of an average of barley-corns, or of Musoori picc, appear to me less liable than most others to error, and the mean of these is 31.93 inches. It is probable that the length 2460 barley corns, or 400 picc, divided by 10, would give a still nearer approximation.

[We think the argument deduced from the measurement of the apartments being integrals of the guz to be conclusive, for it is the native mode of laying down the ground plan of a building always to divide the paper off into squares of some unit of length:—See the plan of the Visvesvur Shiwala in PRINSEP'S Illustrations of Benares, first series. In that building the unit was also one guz, but it was the *maimáree* guz, of about 26 inches, still commonly employed in the town. From similar measurements of other ancient buildings, Muhammedan and Hindu, might thus be obtained with tolerable accuracy the value of linear measures of different periods.—ED.]

VIII.—*Proceedings of the Asiatic Society.**Wednesday Evening, the 6th August, 1834.*

The Reverend W. H. MILL, D. D. Vice-President, in the chair.

Monsieur FERDINAND RENAULD, proposed at the last Meeting, was elected a member of the Society.

Mr. M. LARRULETA, at his own request was allowed to withdraw from the Society.

Read a letter from H. T. PRINSEP, Esq. General Secretary to Government, returning thanks for the Meteorological Registers furnished in pursuance of the resolution of last Meeting.

Dr. J. TYTLER addressed the meeting in explanation of the delay which had occurred in the reply of the local committee of the Oriental Translation Fund to the reference of last April, regarding the publication of Mr. YATES'S *Nalodaya*.

But two members of the original committee now remain in India, and the funds were lost by the failure of Messrs. MACKINTOSH and Co. It was out of their power therefore, to patronize the work to the extent that would be required for its publication in India: and the committee did not feel authorized to pledge the fund at home to adopt the work as one of its own series if printed in India, although such might probably be the event.

Mr. J. PRINSEP moved, seconded by the Vice-President, that the Asiatic Society should subscribe for fifty copies at 12 rupees, as suggested by the author.

BHUBO RAM COMUL SEN, seconded by Mr. PRINSEP, moved as an amendment that twenty-five copies would be sufficient for the purposes of distribution to those Societies entitled to receive a copy of the Society's works. The amendment was carried by a majority of 2.

*Library.*

Read a letter from EDWARD T. BENNETT, Esq. Vice Secretary of the Zoological Society of London, forwarding a copy of their proceedings, April—December, 1832.

Read a letter from Raja KALIKJSSSEN, forwarding on behalf of Nawab IQBAL-ODD DOWLUH BUHADOUR, a copy of his work, called "*Iqbal-e-furung, or British Prosperity*," accompanied by a literal translation into the English.

Read a letter from NASMYTH MORRIESON, Esq. W. S. presenting a copy of his work entitled "*Hints on the Trisection of an Angle and the Duplication of the Cube in Elementary Geometry*."

The second part of the *Christa Sangita*, by the Rev. W. H. MILL, D. D., published at the Bishop's College Press, was presented—*by the Author*.

Meteorological Register for June, 1834, *by the Surveyor General*.

Madras Journal of Literature and Science, No. 4, *by the Madras Literary Society*.

The Calcutta Medical Journal for July—*by the Editors*.

*Museum.*

An image of Buddha in fine preservation, dug up in the neighbourhood of Kabul, was presented in the name of Dr. J. G. GERARD, through the Hon'ble Sir C. T. METCALFE, V. P. &c.

A paper was read, drawn up by Munshi MOHUN LAL, who accompanied Dr. GERARD, explaining the circumstances of the discovery of this image, from which the following is an extract.

“ South of the town of Kábul, two miles distant, a range of rugged and barren mountains commands the ruins of the ancient city, which shews nothing curious but a heap of dust mingled with stones and bricks. In the rainy season the poorer class of people rove about and search the place day and night, and their labours are rewarded by finding small silver and gold leaves bearing the figure of the sun and moon upon them; sometimes they possess themselves of cows and deers made of stone or copper of a very small size but beautiful form. While we remained at Kábul we employed our time in digging the antiquities and the graves of the old inhabitants of that country, which are said to be both Bactrians and Buddhist, but unfortunately none of the mausoleums favored us with any coin or writing by which we could prove the descent of the buried. However some of them contained earthen lumps full of small pieces of bones and also rotten pearls, which confirm the dead to have been idolaters. The Hindoos both of the present and former days who believe in the multiplicity of Gods, maintain a peculiar custom of filling the mouth of their deceased with pearls and also with coins. All these monuments flourish at the skirt of the same hill which views the ruins of the ancient city.

On the 7th of November, 1833, we hurried down to the above place, and hired nine men to dig the earth till the day closed, but our labours were fruitless; from the 8th to the 19th of the same month, we continued our operations, and during which space the diggers were checked by a close work of lime structure. We told them to break through it, and after digging seven paces further, they opened in a large and beautiful roofed square; it must have remained long in such a state of preservation that one might suppose that it was freshly plastered with lime. The cell was handsomely gilt and coloured by lapislazuli, which is found in considerably quantities in the mines of Badakhshán, 12 days' journey from Kábul: such was the situation of the place where we found the stone image lying on the ground.”

The figure represents Buddha in the usual sitting posture of tranquil repose, clothed to the neck in a thin flowing drapery; flames of sacred fire appear on his shoulders, and a circular glory surrounds the whole, serving as a field for the sculpture, for it is an alto relievo: upon the glory are carved two angels bearing chattas, and on each side a small group representing some acts of Buddha's life: in one he seems to be distributing charity, in the other he is receiving the homage of his worshippers.

We shall take an early opportunity of inserting a sketch of this sculpture, which is highly important from its apparent connection with the history of the Afghan topos.

A letter from Lieut. E. C. ARCHBOLD, Bengal Light Cavalry, dated Bombay, 5th July, 1834, announced that he had forwarded to the Secretary, as a present to the Society, an Egyptian mummy.

The mummy was obtained with some difficulty from the tombs of the kings at Gourvah. The native crew on board the ship which brought Lieut. A. from Mocha, having objected to receive the Mummy with his baggage, he had been under the necessity of requesting one of the officers of the Sloop of War Coote to bring it

onward to Bombay, whence it will be forwarded to Calcutta by the earliest opportunity.

Mr. TREVELYAN introduced Munshi MOHUN LAL to the Vice-President and Members, who proceeded to exhibit the articles brought to Calcutta by him, of which many were presents to the Society from Dr. GERARD.

The collection consisted of ancient coins ; seeds of fruits, flowers and trees from Kábul ; the sculpture already noticed ; and specimens of the manufactures and natural productions of Afghanistan.

Among the coins were the usual variety of Indo-Scythic and Bactrian now so familiar to us : one very beautiful silver tetradrachm, of EUTHYDEMUS, attracted peculiar attention from its rich relief and exquisite workmanship. Several of the copper moneys of APOLLODOTUS, MENANDER, the AGATHOCLES of Masson, HERMÆUS, KANERKOS, KADPHISES, &c. had very legible inscriptions. These coins had been procured in various places on their route through the agency of MOHUN LAL for Dr. GERARD, but he had unfortunately omitted to notice the localities in which each variety was most prevalent.

The box of seeds was made over on arrival, to Dr. WALLICH, who has examined them with care, and has selected a portion for transmission to the colony of Van-Dieman's Land, where they are likely to thrive and become a valuable acquisition, for the fruit of Kábul is proverbial for its excellence and variety.

The specimens of cloth, silk, carpet, chintz, of the countries passed through on the return of the travellers from Meshid to Kábul may be useful to the commercial community.

Extracts from the journal regularly kept by MOHUN LAL, in *English*, from the day he joined Lieut. BURNES's party were read. They evinced very respectable fluency in the English language, and a laudable and lively curiosity into the new objects and the manners of the people among whom he was travelling for the first time and at so early an age. A wish was expressed by some of the members present that he would publish his notes, scattered extracts of which have already appeared in the Delhi newspaper : we are sure that such an object would meet with general encouragement, and that this first fruit of English education in the mofussil would do credit to the pupil, and to his *Almamater* the Delhi Anglo-Indian College.

The best thanks of the Society, were voted to Dr. GERARD and to MOHUN LAL for these valuable contributions.

Read a letter from W. H. WATHEN, Esq. Persian Secretary to the Bombay Government, communicating a memoir on the Uzbek state of Kokan, (the ancient Ferghana) in central Asia ; also the memoir of a Pilgrimage made by an Usbek and his two sons from Kokan through Russia to Mecca, in the year 1820.

These interesting papers, relating to a state placed betwixt our Indian Empire, China, and the territories of Russia, will form a valuable sequel to the information derived from the expeditions of MOORCROFT, BURNES, and GERARD : we make no analysis, because they will be published at length, in a forthcoming No. of the Journal.

#### *Physical.*

A small collection of the principal fossil shells of the gault and greensand of Hythe was presented in the name of Captain JOHN FINNIS, on his return to India from furlough.

These shells are described in a small work by Professor FITTON, on the Geology of Hastings; he deduces from their presence the identity in time of this formation and the chalk: the collection contains the following shells:

Sphœra corrugata,	Greensand,	Inoceramus sulcatus,	Gault.
Cyprina angulata,	do.	———— concentricus,	do.
Ostrea ———,	do.	Solarium ———	do.
Terebratula sella,	do.	Nautica umbilicata,	do.
———— elegans,	do.	Ammonites ———,	do.
Nucula pectinata,	do.	Pentaerinites,	do.
———— ovalis,	do.	Belemnites,	do.
Serpula——,	do.	Echinus ananchites, (chalk.)	
		———— spatangus, (gravel.)	

A letter was read from Major BURNEY, Resident at the Burmese Court, dated Rangoon, June 17th, accompanying an extensive collection of fossil bones from Yenang-young and the neighbouring hills in Ava, for the inspection and examination of the members of the Asiatic Society. Also a few in a separate package obtained by Captain McLEOD, during his Mission up the Khyendwen river, (a fossil elephant's jaw and teeth.)

Major BURNEY describes the mode in which this magnificent collection had been made by the natives at his instigation. "Every Burman, from the Governor to the peasant, strove to make the search after fossils a good speculation, and they were brought to me one by one to secure a more advantageous bargain. There was no digging for them: they were found lying on the very surface of the ground, sometimes only partially covered by the peculiar sandy and gravelly soil of that part of the country. Some of the fossil teeth will be observed to be injured: this proceeds from small bits having been chipped off by the Burmese to be used as medicine,—to be ground down with water and taken for the gravel."

The general nature of the Ava fossils has been so ably treated of in Professor BUCKLAND's memoir on the collection taken home by Mr. CRAWFORD, that nothing is wanting on this head: almost all the individuals noted by him may be recognized in the present series: which contains on a rough examination the following species:

- 2 jaws and several teeth of the fossil elephant.
- 7 jaws and teeth of mastodon, hippopotamus, &c.
- 8 fragments of alligators' jaws.
- 47 vertebræ of saurian reptiles.
- 170 fragments of the emys and trionyx shell.
- 1 humerus of the rhinoceros, and nearly
- 200 unclassified fragments of bone.

The Secretary noticed the safe arrival of the gigantic remains of the fossil elephant discovered by Dr. SPILSBURY in the banks of the Omar Nadî near Narsinghpur.

They had been dispatched from Jabalpur across the country to Benares, where Dr. Row had kindly taken charge of them until an opportunity offered for their secure conveyance to Calcutta under charge of Captain SAYERS. The five fragments, consisting of the extremities of two fossil femurs of a mammoth and the head of a buffalo, were placed on the table side by side of modern skeletons of the same nature, to exhibit the contrast more forcibly. Extracts from Dr. SPILSBURY's letters, and a note by the Secretary were read:—also a memoir by Dr. SPILSBURY on a geological section which he has recently had an opportunity of making across the



valley of the Nerbudda from *Tendukhera* to *Bittoul*, during which he discovered another locality of fossil deposit. It was accompanied by a map of the country.

This paper and the fossil notices shall be given if possible in our next number, to satisfy the great curiosity excited by the uncommon perfection of the specimens.

The geological specimens were accompanied by samples of the coal discovered by Captain OUSELEY, whose report of progress in examination of the strata was also read.

### IX.—Miscellanea.

#### 1.—Note on the Locality of *Rájagriha*, and Description of the Town of that Name in Behár, and of a Hot Spring in the neighbouring Hills.

*Rájagriha* was JARASANDHA'S capital city:—query—is it *the Rájagriha*, the capital of *Práchi* proper, which was built by PRITHU, and taken by BALARA'M, brother of KRISHNA, or is the latter the same as *Rájmehal*? The present village of *Rájagriha*, or *Rájgr*, contains about 800 or 900 houses, and is situated about 13 or 11 miles S. S. W. of the town of *Behar*, on the north side of a range of hills of that name (*Rájgr*). A little way up a valley, south of the village, are a number of hot-springs, similar to that at *Monghár*. In the hottest spring the water stood at 108° in October, when the temperature of the atmosphere was about 70°. The water on a rough examination was found to contain a very minute portion of nitre, or a substance resembling it. These springs are considered sacred by the Hindús. Farther up the valley expands into an open plain, surrounded by hills, about one and a half or two miles in diameter, where in several places the remains of the old city of JARASANDHA is pointed out. There is a tradition of a great battle having been fought there between the Jains, under SREENIKA Mahárája, and JARASANDHA, or his successors; and a cave in the side of one of the hills, (similar in shape to those near *Gyah*,) is pointed out as the place where one of the parties concealed all his treasure: tradition says, it is still to be found.

There is still an establishment of Jains in *Rájgr*: they have a number of small temples on the tops of the neighbouring hills, and at a place called *Pava Purí*, six or seven miles east from *Rájgr*, in the centre of a small lake, is one of some importance, which is visited by numerous Jains on their way to, and from, *Párisnáth*.

T. R.

#### 2.—Note on the Temperature of Wells at *Náhan*.

With reference to the Rev. Mr. EVEREST'S Remarks on the Climate of the Fossil Elephant, (Art. III. January No.) the following observations relative to the temperature of *Náhan*, may (in absence of better information) be useful.

November 7. Temperature of several springs issuing from the north-side of the hill, on which *Náhan* is situated, 70½ to 71°; water exposed in *Boulis*, 64 to 69°. Observation taken in the evening.

Open air shortly Nov. before sunrise.	Shade. 10 A. M.	3 P. M. shade.	Winds.
7      50°	62°	65	S. W. cloudy.
8      59	64	67°	S. W. 61½ shortly after sun-set.
9      56	64	65	W. 67° 2 P. M.
10     56		64	

Snow is said in the memory of man to have fallen only once at *Náhan*.

From the localities of *Náhan*, which is situated on the bare crest of a rocky hill, it seems improbable that wild elephants should frequently haunt that place; the *Kardah Dán* lies about 6 or 800 feet lower down, it is covered with rich rank vegetation; here elephants are found.

Hyænas are common at *Simlah*, the mean temperature of which is between  $57^{\circ}$  and  $58^{\circ}$ ; they are found during summer, at elevations of 8 or 10,000 feet, their winter habitations I know not.

Has Mr. FLEMING explained in what manner we find fossil tropical plants in regions where such plants no longer thrive? LYELL remarks, "We cannot suppose the leaves of tree ferns to be transported by water for thousands of miles without being injured." . . . . . D. S.

### 3.--Fall of Fish.

On the 16th or 17th May last, a fall of fish happened in mouza *Souare*, pergunna *Dhata Ekdullah*, zillah *Fittehpur*. The zemindars of the village have furnished the following particulars, which are confirmed by other accounts: About noon, the wind being from the west, and a few distant clouds visible, a blast of high wind, accompanied with much dust, which changed the atmosphere to a reddish yellow hue, came on; the blast appeared to extend in breadth about 100 yards, chappars were carried off, and trees blown down. When the storm had passed over, they found the ground, south of the village, to the extent of two bigahs, strewed with fish, in number not less than three or four thousand. The fish were all of the *Chalwa* species, (*Clupea cultrata*, Shakespear's Dictionary,) a span or less in length, and from one and a half to half a seer in weight: when found, they were all dead and dry. *Chalwa* fish are found in the tanks and rivers in the neighbourhood. The nearest tank in which there is water is about half a mile south of the village. The *Jumna* runs about three miles south of the village, the *Ganges* 11 miles N. by E. The fish were not eaten; it is said, that in the pan they turned into blood! S.

*Allahabad, June 26, 1834.*

### 4.—Transactions of the Batavian Society, Vol. XIV.

[We have given an analysis of the 13th volume of this rapidly increasing collection, in vol. ii. page 597.]

The contents of the 14th volume are, "Historical Review of the Proceedings of the Europeans at Japan, by G. E. MEYLAN, chief of the Netherland trade at Japan." Also a "Treatise on Acupuncture, by Dr. VON SIEBOLD."

The whole of the 15th volume is a Grammar of the Java language, by the late Mr. CORN. DE GROET, published at Batavia by Mr. GERÏCKE, Director of the Java Institution at *Soerekarta*.

### 5.—Protection of Tinned Sheet Iron from Rust.

Serjeant DODD, late overseer of the *Jumna* works, constructed a buoy of tin, which he painted with two coats of white lead: he then gave it a coat of hog's lard, about the thickness of a coat of paint, and laid over this latter, another coat of paint: each coat was allowed to dry thoroughly. The buoy was then placed in the river, so as to remain continually under water all the rains, or nearly a year. When taken up, the experiment was found to have succeeded completely. [Had the water penetrated to the tin, a galvanic action would have caused a rapid corrosion of the iron. If the iron however were carefully coated on the edges and joints, the tin would form a perfect protection, without the aid of paint or grease.] A.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of July, 1834.

Days of the Month	Barometer reduced to 32° Fahr.				Thermometer in the Air.				Depression of Moist-bulb Thermometer.				Hair Hygrometer.		Rain. Inches.	Wind.		Weather.		
	At 4 A.M.	At 10 P.M.	At 4 P.M.	At 10 P.M.	Minimum	At 4 A.M.	At 10 A.M.	Max. by Reg. Ther.	At 4 P.M.	At 10 P.M.	At 4 A.M.	At 4 P.M.	At 10 P.M.	At 10 A.M.		At 4 P.M.	Morning.	Noon.	Evening.	
1	.530	.601	.530	.615	80	83.6	85.0	84.6	82.1	2.6	3.8	4.8	2.4	96	.05	n.e.	E.	stratus.	drizzle.	clear.
2	.626	.632	.544	.632	80.2	84.1	86.8	85.5	82.2	0.2	3.7	3.7	2.0	96	.05	o.	s.e.	overcast.	dull.	do
3	.617	.672	.570	.679	80.2	83.9	88.0	86.8	83.0	0.2	4.0	5.4	1.5	95	.05	o.	S.E.	clear.	clear.	showery.
4	.722	.645	.564	.638	82.1	84.2	88.0	86.7	82.4	2.0	5.2	5.0	2.0	96	.05	o.	S.E.	do	cloudy.	clear.
5	.627	.664	.568	.668	81.2	84.9	88.0	86.8	82.1	1.2	3.1	4.0	2.9	96	1.35	s.	S.E.	nimbi.	do	do
6	.632	.676	.502	.678	80.4	85.0	89.3	85.1	82.8	0.8	4.6	3.6	3.4	96	.25	o.	o.	clear.	storm.	do
7	.637	.676	.590	.677	81.0	85.6	89.7	88.2	83.4	1.4	5.2	6.1	3.4	94	.10	o.	w.	stratus.	fine.	bright.
8	.644	.693	.593	.685	81.2	86.7	91.6	88.7	84.6	1.7	6.7	6.5	3.9	93	.10	o.	s.	clear.	do	do
9	.644	.668	.550	.643	82.0	87.6	91.2	91.2	84.2	2.0	5.4	10.2	3.2	94	1.10	o.	s.e.	do	cum.	do
10	.625	.640	.540	.565	83.1	88.2	92.1	91.6	86.0	2.1	7.4	9.8	4.2	89	.10	o.	S.	do	do	clear.
11	.579	.550	.468	.579	84.0	88.6	92.0	92.6	78.2	3.0	6.4	8.9	1.8	94	.10	o.	S.	rain.	overcast.	rain.
12	.564	.580	.460	.634	79.9	87.4	90.5	90.6	85.6	1.8	5.7	8.7	3.9	89	.05	o.	s.	haze.	do	cir. cum.
13	.497	.540	.402	.512	83.4	87.1	94.0	87.8	83.4	1.3	5.7	6.6	3.4	93	.60	o.	s.e.	clear.	do	cum. str.
14	.450	.489	.420	.530	81.2	86.8	86.8	86.6	81.5	1.0	5.8	5.3	1.4	95	.10	o.	s.e.	do	showery.	do
15	.451	.544	.486	.590	80.0	87.7	90.0	88.8	85.2	0.0	5.1	6.6	4.8	96	.10	e.	s.	do	rainy.	do
16	.570	.598	.546	.646	82.0	88.5	96.0	86.0	83.1	1.6	6.3	4.9	3.3	94	.10	n.e.	s.e.	do	showery.	cum. cir.
17	.615	.669	.554	.649	79.2	86.2	89.0	88.0	83.2	1.2	5.3	5.5	3.4	95	.10	o.	var.	do	clear.	do
18	.599	.636	.548	.614	81.2	87.6	90.0	88.4	83.2	1.0	5.1	6.1	2.8	95	.10	o.	var.	do	cum. str.	do
19	.574	.569	.499	.572	82.3	87.9	90.3	88.6	83.1	2.0	5.5	5.7	1.7	95	.25	o.	e.	do	do	do
20	.567	.526	.429	.540	82.0	88.4	90.1	88.5	83.0	0.8	5.2	6.0	2.2	93	.25	s.e.	s.e.	cir. cum.	fine.	clear.
21	.506	.520	.360	.514	82.0	85.1	90.0	88.5	83.2	1.0	4.1	6.9	2.8	92	.40	o.	s.w.	do	misty.	cumulus.
22	.470	.514	.410	.504	82.0	87.4	90.0	88.9	84.2	1.3	5.4	5.8	3.7	94	.40	o.	s.w.	do	overcast.	do
23	.447	.492	.384	.468	82.0	87.5	89.6	87.5	83.2	1.3	6.1	4.6	2.6	96	.10	s.e.	s.w.	haze.	do	clear.
24	.410	.426	.386	.427	82.0	87.0	89.4	88.6	84.5	2.0	5.0	5.6	4.9	94	.20	o.	n.e.	do	cum.	do
25	.394	.376	.298	.387	82.0	86.4	88.6	87.8	83.0	2.0	4.4	5.1	2.6	96	.25	N.E.	N.E.	clear.	rain.	scud.
26	.376	.426	.370	.451	81.4	86.1	84.4	86.0	82.2	1.4	4.1	4.5	1.8	97	.15	N.E.	N.E.	hard rain.	fair.	clear.
27	.426	.444	.380	.490	81.0	86.6	90.6	87.7	84.6	0.8	4.3	5.6	2.9	95	.35	o.	e.	clear.	haze.	do
28	.460	.522	.424	.530	83.0	87.3	91.5	88.7	84.3	1.8	4.4	5.6	2.8	95	.35	N.E.	n.e.	do	haze.	do
29	.504	.530	.420	.506	83.0	88.0	89.7	89.0	83.4	1.0	5.6	6.5	2.6	93	.35	N.E.	n.e.	do	do	do
30	.497	.512	.380	.467	82.0	87.8	88.2	87.4	83.8	1.3	5.3	5.4	3.4	95	.35	o.	E.	do	cloudy.	do
31	.494	.386	.278	.387	81.1	86.7	104.0	87.6	83.2	0.5	4.8	5.3	2.2	96	.35	n.e.	n.e.	haze.	do	rain.
Mean	29,540	.563	.470	.562	81.5	86.6	90.0	88.0	83.3	1.4	5.1	6.0	2.9	94	5.50	easterly		rain kept off.		

There was a smart shock of an earthquake felt in Nipal on the 11th instant, at 9h. 40m. P. M. The same was experienced at Monghir at 10h. 10m. P. M. It was not observed in Calcutta.

The Standard Barometer, announced at the foot of the last Journal as just arrived per Neptune, was found, on opening the case, to be broken! The cistern was cracked, and the mercury had escaped.

# JOURNAL

OF

## THE ASIATIC SOCIETY.

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I.—*Memoir on the U'sbek State of Kokan, properly called Khokend, (the Ancient Ferghana,) in Central Asia. By W. H. WATHEN, Esq. Persian Secretary to the Bombay Government, &c.*

[Read at the Meeting of the 6th August.]

DURING the last few years, circumstances have taken place which have caused the Muhammedan inhabitants of Central Asia, and even of Chinese Tartary, to prefer, in performing their pilgrimage to Mecca, the circuitous route of Bokhára or Samarkand, Kúndúz, Taush Kurgáún, Balkh, Kábul, Kandahar, and Kelautí-Nasír, and Bela, to Sonnians, whence they pass in boats to Bombay, and from the latter port to Judda, to either the road through Russia round the Caspian viâ Astrakhan, or the more direct one through Persja.

The causes which have led to this change of their accustomed route, which was through Russia, are said to be—first, some misunderstanding betwixt the Cossac tribes, under the influence of Russia, and those of the Kokan prince, in consequence of which, the Russian government is said to have stopped the communication through its territory. With regard to Persia, the bigotted feelings of its inhabitants, who are Shíahs, against the Tartars, who are of the opposite sect of the Sunís, has long deprived the pilgrims from Tartary of all access to its territory, so that there remains no other way of performing the pilgrimage except through the Afghan provinces.

These circumstances have led to the resort of pilgrims to Bombay, from countries situate in the very heart of Asia. I calculate that within the last two years, at least three hundred zealots of this description have arrived at Bombay from the cities of Bokhára, Samarkand,

Kokan, and Yárkend. Among those who arrived during the present year, 1834, was a noble of high rank of Kokan; his name was KHOJA BEHÁDUR KHÁN, who held the title of KHU'SH BE'GI, and was prime minister to the prince of that country; his son, said to be foster-brother to the same prince, and a suite of about twenty followers, accompanied him.

On my hearing of the arrival of these illustrious strangers, I took the first opportunity of forming an acquaintance with them, with the view of obtaining information respecting the state of things in a country so little known\* to Europeans, and I collected the following particulars.

In the first place, I shall endeavour to describe the geographical situation of this country, as well as the information received will enable me.

The principality of Kokan appears to be situated between the parallels of from thirty-nine degrees to fifty-five degrees of north latitude, and to extend from the sixty-fifth to the seventy-fifth degree of east longitude.

On the east, it is bounded by the country of Káshgar, in Chinese Tartary, the river Oxus or Amú is its limit; to the south-east, Badakhshan, Kaviategín, and Derwáz; west, it is bounded by the Bokhára territory; and north and north-west; by Russian Tartary, and the Steppes occupied by the roving Cossacs, under the influence of Russia.

This country, with the exception of the Steppes adjoining the Russian frontiers, and the sandy deserts lying betwixt it and the Bokhára territory, is said to be very populous and fertile, and being watered by many streams and rivers, which have their source in the Ulugh Tágh, and other mountains, and which mostly flow into the Sir or Sihún, the ancient Jaxartes; all the fruits of temperate climates are produced in great abundance, especially apples. The melons are very superior. Barley and wheat are also raised, the former in great quantity.

A few words will suffice to give the history of this country:—Tradition states it to have been under the rule of AFRÁSIÁB, king of Turán, whose wars with the Persians are commemorated in the Sháh-náma of FIRDOSI. The present city of Turkistán is said to have been his capital. It was overrun by the Arabs in the third century of the Hijra. Subsequently the Sultáns of the Samáuí dynasty annexed it to their empire. It then fell, in the thirteenth century, with the rest of Asia, to the conquering armies of CHENGÍZ KHÁN†; afterwards, on the

\* It has not been visited by Europeans, I believe, since the 14th century.

† On the death of CHENGÍZ, it became the portion of his eldest son JA'GHATA'I, or CHAGHATAIR.

decline and division of the Mongol Empire, under his successors, it was conquered by the famous AMÍR TIMU'R, who bequeathed it to one of his sons: from whom it descended to the famous BÁBER, who reigned at the city called at present Andeján, but which was formerly called Almálij, or "The Place of Apples," from the number of orchards of apple trees, by which it was surrounded. Shortly after the accession of BÁBER, about 1520\*, the U'sbek Tartars were forced by the rising power of the Russians to abandon the southern parts of Siberia, &c., which had formed part of the Tartar kingdom of Kiptchak; on their way southward, under the command of their leader SHUBÁNÍ KHÁN, they overran all the states of Central Asia, Bokhára, Samarkand, &c., and after a brave resistance, BÁBER, among the rest of the princes of that country, was obliged to abandon his patrimonial kingdom, and fly to Kábul, where he fixed his government, and whence having concentrated his forces, he invaded India, took Delhi in 1526, and there established the present Moghul dynasty; ever since the flight of BÁBER, the country of Kokan has been governed by U'sbek princes, who trace their descent from CHENGÍZ KHÁN, and who transferred the capital from Andeján to Kokan.

The state of Kokan consists of eight extensive governments, each deriving its name from its chief town; these are—to the south-west of the city of Kokan the fortified town of Urutippa, and its dependent district; to the west, the ancient city and dependancy of Kojend on the Sihun or Jaxartes; to the south-east, the districts of Uch and Marghilan; to the north-east, Nemengán and Andeján: to north and north-west, the cities of Táshkend and Turkistáu, with their districts: these with Kokan form together eight distinct governments.

The districts of Táshkend was till lately under a separate chief, who was a Syed called YONÍS KHOJEH†, but has been taken from his sons by the present KHÁN of Kokan.

The governors of all these provinces are appointed and removed by the KHÁN, or king, at pleasure; they are all military commanders, and generally hold the rank of Ming-Báshís, or commander of one thousand horse. The king is not, as in Persia, dependent for support on the warlike tribes, but keeps up a standing army of cavalry, which is supported by an allowance of grain and forage from the districts in which they

\* They are called U'sbek from a descendant of CHENGÍZ KHÁN, who was the head of the golden horde, and so beloved, that they adopted his name. In like manner the Noghai Tartars have obtained their peculiar appellation; they belonged to the Great Horde.

† Khojeh is a title given by the Tartars to Syeds, as Sherif in Turkey, and Meer and Shah in India.

are stationed, besides a small amount of pay. The use of infantry is unknown. The KHÁN is said in cases of emergency to be able to bring 50,000 horse into the field.

Most of the inhabitants of this kingdom, with the exception of the Cossac hordes, on the borders of Russia and the Karghiz, towards Káshgar, are U'sbeks, who cultivate the ground themselves. In some parts there are Tájiks\*, or people of Persian extraction, who speak that language, and are as serfs to the U'sbek lords, whose estates they cultivate.

Kokan, the capital, is said to be a very large and populous city, it is not surrounded by a wall; its population is reported to exceed that of Bokhára, and it is said to contain one hundred colleges and five hundred mosques†; the number of its inhabitants is rated at 100,000; it has many beautiful orchards, and is situated upon two small rivers, called the Aksái and the Kárásái, which fall into the Sihun or Jaxartes, near Kojend. It contains a large colony of Jews; about twenty Hindus, and many Cashmerians; no Armenians; but there are some Noghai Tartars from Russia, especially one, who is a watch-maker.

The Ulema, or literati, are well read in the Persian classics, and the Persian language is spoken with nearly the same accent as by the Afgháns; the dialect differs much from that now used in Persia, and more resembles that of the 16th century. Many Turki compositions are also read and admired; the Turki spoken in this country, is what is called the Jághatái‡, and differs much from the Turki of Constantinople, which however derives its origin from it.

The climate seems to verge on extremes:—in the winter, great cold prevails, and much snow falls; in the summer again the heat is oppressive.

The natives are as bigotted Mu'ammedans as those of Bokhára. A mohtesib goes round and bastinadoes any one caught smoking tobacco.

\* The word Tájik was first used to distinguish those who had been subject to the Arab rule in contradistinction to the invading Turks.

† I suspect my informant of some exaggeration here.

‡ The Jághatái Turki is the language of Central Asia, from the river Ural to the Oxus, and from the Caspian to Yarkend, (in many of the cities however Persian is generally spoken and understood;) this refined dialect of the ancient Turki was called Jaghatai, from having been much polished and refined during the reign of JAGHA'TA'I KHA'N, the son of CHENGÍZ. From this language is derived the language of the Turki of Constantinople, of the Turkmans, and of the Elluat of Turkish origin in Persia, though these dialects differ considerably now from the mother tongue, and in the Usmalú Turki, so much Arabic and Persian has been introduced as to render this language very difficult to be understood by the natives of Tartary.

Wine and dancing women are most strictly prohibited. They are of the Suní sect, and follow the observances of ABU HANIFEH ; they detest Shíahs, and call them worshippers of ALI. Much smoking and drinking of kimmiz\* privately does take place. Horset† flesh is considered a great luxury, and often sold in the bazars.

The present KHÁN or king (for KHÁN is considered a very high title in Tartary) is named MAHOMED ALI : his father was OMÁR KHÁN ; his uncle, who reigned conjointly with his father, was named A'LIM KHÁN ; their father was NAUR BUTEH KHÁN, whose grand-father was SHURUGH BE'G, who claimed his descent from CHENGÍZ KHÁN. The present KHÁN succeeded on his father's death, which happened about twelve years ago.

I shall now attempt to portray the political relation in which this state stands with reference to its neighbours, and give an account of them ;—and first of Chinese Tartary. That part which is contiguous to Kokan is the government of Káshgar, which has under it the provinces of Yárkend, Khoten, Auksú, and Turfán, (called by the Chinese Sining ;) these are all Muhammedan countries, which became subject to China in 1759, in the reign of the Emperor‡ KIENLUNG. Hostilities existed some years ago betwixt Kokan and China, but after a war of some continuance, the cause of which I shall hereafter explain, peace was concluded betwixt the KHÁN and the Chinese, and is likely to be permanent.

South of the KHÁN's territory is the extensive and mountainous country of Karrategín, until of late ruled by sovereigns universally believed by the tradition of the country to be descended from ALEXANDER THE GREAT. On the death of the last Shah, or king, his sons disputed and fought amongst themselves for the succession, and in consequence, their kingdom fell an easy prey to the king of Derwáz, a Tájik prince, and is still under his rule : these unfortunate descendants of ALEXANDER are said by my informants to be wandering about in poverty, and subsisting on the charity of the surrounding princes. Several were at Kokan, and others at Bokhára.

Badakhshán, and the countries of Kundúz, Tash-kurghan, and Balkh are under a powerful U'sbek chief called MURÁD ALI BE'G, who lately acquired Balkh, &c. from the sons of KILICH ALI KHÁN. With these states and the KHÁN of Kokan a good understanding exists.

\* A spirituous liquor made from mare's milk.

† Horses having any defect, disabling them from work, are fattened for this purpose.

‡ The same Emperor to whose court Lord MACARTNEY went as Ambassador.



BEHÁDUR KHÁN, son of MURÁD BE'G, is the reigning prince of Bokhára and Samarkand, and their dependencies ; the last named city is at present much reduced in both size and population : there are several magnificent remains of the buildings erected by the famous TIMU'R, and there is among the rest, a block of blue marble or jasper called the *Kúk-Tárish*, formerly used as a throne by the Tartar emperors, and said to have been brought by TIMU'R from one of CHENGÍZ KHÁN'S palaces in Mongol Tartary\*, which to this day is an object of great importance to the Chinese, who wish to take it to China from some superstitious ideas they connect with it, and the prosperity of the present Mantchu dynasty.

The present KHÁN of Kokan is on terms of amity with the sovereign of Bokhára.

The part of the Russian Empire which touches on this territory is dependent on the government of Orenburg and Tomsk. The boundary of the two states is defined by the river called by the U'sbeks the *Kúk-Sú*, or blue river, probably the Irtysh.

The political relations of this state with Russia are as follows :

Much uncertainty having prevailed respecting the limits of the two nations, and disputes having constantly occurred, owing to the Cossac hordes of the one encroaching upon the Steppes occupied by those of the other, and vice versá, about six or seven years ago envoys were deputed by Russia to the KHÁN of Kokan, to fix the limits definitively ; these envoys came from Orenburg, and brought with them as presents from the emperor, (whom the U'sbeks call the *АУК KHÁN*, or White King,) several mirrors of very large dimensions, a musical clock, and guns and pistols. After some negociation, it was settled that the river called the *Kúk-Sú*, or blue river, should be the boundary between the two states, the Cossac hordes of Russia keeping to the north of it, and those of either state not to pass that river to the south or north. Beacons also were erected along the line of frontier. My informants said, however, that within the last three years the Russians have encroached upon those limits, and erected forts to the south of the river. The Khán on this account lately deputed an envoy to St. Petersburg, with an elephant and some Chinese slaves, as a present to His Czarish Majesty, of whose

\* The following is an account of this wonderful block of marble or jasper, as given by BA'BER in his memoirs :—“ Towards the hill of Kohik, there is a small garden, wherein is an open hall, within which is a large throne of a single block of blue jasper, about 28 or 30 feet long, and 10 or 16 broad, and 2 in height. This throne was said to have been brought from Chinese Tartary, probably from one of CHENGÍZ KHÁN'S Urdús.”

arrival however no news had been received, when my informants left their country about a year ago.

With respect to the other great empire, China, which lies to the eastward of this country, a good understanding seems to have existed for many years between the two governments, until a circumstance occurred about seven or eight years ago, which led to hostilities; this was the rebellion of **JĒHÁNGÍR KHÓJA** of Káshgar: this person, who laid claim to the sovereignty of that country, and whose ancestors are said previous to the Chinese conquest to have held the chief authority there, having been worsted in some encounter with the Chinese, was compelled to fly the country, and take refuge with the roving hordes of Kirghiz subject to the Khán, and subsequently fell into the hands of **MUHAMMED ALI**, who kept him under honorable restraint at his capital. **JĒHÁNGÍR** having however effected his escape, made his way again to the Kirghiz encampments, and having prevailed on them to join him, invaded the Chinese territory. The sovereign of Kokan also being irritated at the bad treatment shewn to the Muhammedan subjects of Tartary by the Chinese authorities, advanced with his troops on Káshgar; surprized the Chinese general in his cantonment near that place, and cut up the Chinese army. The **KHÓJA** also got possession of the city and fort of Káshgar; subsequently the **KHÁ'N's** cavalry over-ran the whole of Chinese Tartary, and got possession\* of Yárkend, Auksú, and Khoten. **JĒHÁNGÍR KHÓJA** however becoming jealous of the **KHÁ'N**, and suspicious of treachery, drew off his troops in a northerly direction, and a large Chinese force advancing, **MUHAMMED ALI** withdrew to his own country. The rebel was eventually seized by the Chinese, sent to the emperor, and cut to pieces in his presence. An envoy was then sent from Peking, (which the U'sbeks call Baujin,) to negotiate peace, which was made on condition of the Muhammedans at Káshgar being subjected to the rule of a deputy of the **KHÁ'N** in all matters of religion, the **KHÁ'N** being allowed a share in the transit duties, and binding himself to keep the Kirghiz in subjection, and to assist the Chinese in case of any insurrection in Chinese Tartary in future; ever since which time, the two governments have been on the best terms, and a reciprocal interchange of presents takes place. The present Chinese Governor of Káshgar is a Muhammedan, called **YUNIS WANG**. The Chinese are said to keep a force of about twenty thousand infantry in their Muhammedan dependencies in Tartary, of which ten thousand are stationed at Káshgar. The Chinese troops are said to be stationed in separate cantonments, which the U'sbeks term Gulbághs, outside of the towns. One of my informants had been at Káshgar, Yárkend, and

\*. The **KHÁ'N** has hence taken the title of **GHAZI** or Victorious over infidels.

Khoten, with the KHÁN's army; he describes Yárkend as a very beautiful 'large city, much like Bombay, and abounding in dancing girls, musicians, &c. They made slaves of all the Chinese they took prisoners.

The Chinese viceroy resides at Káshgar; he is generally a Mantchu\* (Mantchu Tartar) appointed from Pekin, as are the governors of Turfán, Auksú, Yárkend, and Khoten; they are all however subject to the Urganh Wang, or viceroy. These countries have been subject to China about seventy-five years. The distance from Káshgar to Pekin is estimated as two months' journey of a caravan. All these cities contain a considerable population of Chinese colonists, besides the original Muhammedan inhabitants.

The Jágathái Turki is principally spoken; but Mantchu and Chinese are also prevalent.

*On the Commercial Intercourse between Kokan and the  
neighbouring states.*

Free intercourse is allowed by the Chinese government to subjects of Kokan resorting to Káshgar and the other Muhammedan dependencies of that empire, for purposes of commerce. Religious mendicants are also admitted; this permission is however solely extended to those countries. No one of whatever denomination would be allowed to enter China Proper under any pretence whatever, even in case of an embassy: it is necessary for application to be made to the Viceroy YUNIS WANG, at Káshgar, and no one is allowed to proceed until an order be received from Pekin.

The trade between the two countries is conducted as follows: caravans come from Southern China by way of Khoten to Yárkend and thence to Káshgar; they bring tea glued together, and formed into the shape and consistency of unbaked bricks; silk piece goods, satin, porcelain, and various other articles. Tea, however, is the principal article of import: its consumption being general throughout Central Asia, where it is made much in the same way as in Europe, excepting that butter or fat is mixed with it. The merchandize is carried chiefly on horses, from thirty to forty bricks of tea form a load for a horse. From Káshgar the U'sbek merchants bring them to Kokan, whence they are exported on camels to Bokhára. The returns are said to be made in shawls, European articles, raw silk, horses, &c. No direct intercourse exists betwixt Kokan and India, owing to the jealousy of the Chinese government. The passage through Tibet to Cashmere, &c. is interdicted. Shawls and other Indian articles are brought by the circuitous route of Kábul, Balkh, and Bokhára.

\* Many are Muhammedans.

The trade with Russia is carried on by means of caravans: the Kokan merchants meet those of Bokhára at Tashkhend, and forming one body, they proceed viá Turkistan through the Steppes occupied by the Cossacs, part to Omsk, and part to Orenburg. The productions of China, raw silk, camlets, and cotton yarn, are taken to Russia, and the returns are made in furs, gun barrels, and locks, cutlery, Russian leather, and other Russian manufactures. The currency of Kokan consists of gold tillas, equal to about eight rupees in value, and a small silver coin, called a tunkha, nearly equivalent to half a rupee.

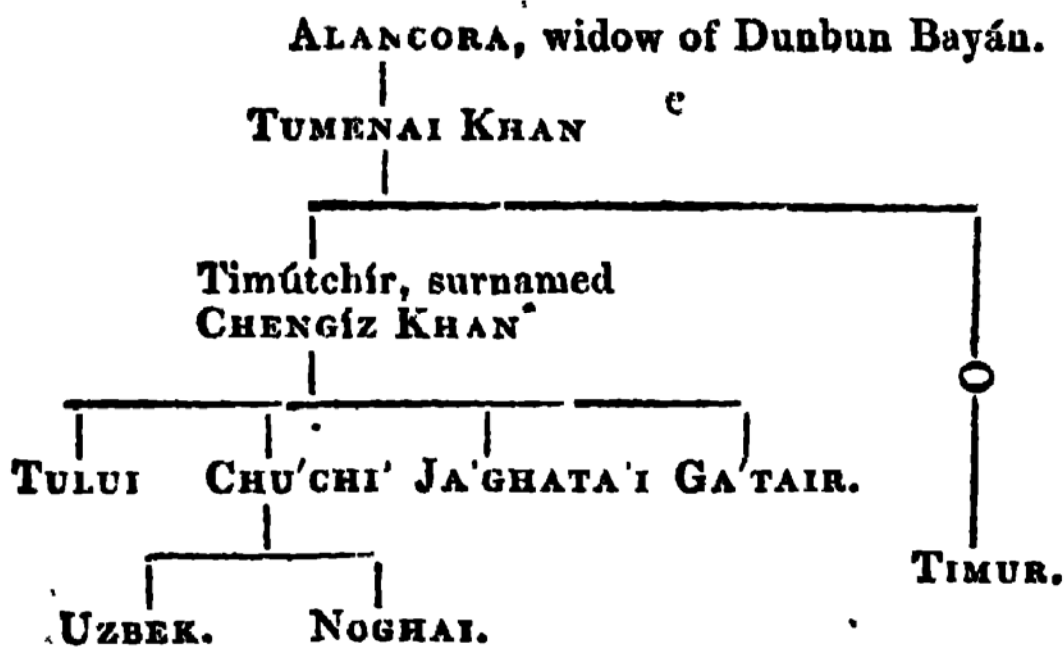
The Usbeks who came to Bombay were quite ignorant of the English name and government. The only Feringís they had any idea of were the Russians. On being asked what nation they supposed was the sovereign of Hindustán, they said they thought it was like Kábul and Kandahar, under some Mussulman government; they expressed great horror at the Sikhs not allowing the Muhammedan religion to be publicly performed in the Panjáb. They had first of all intended to go to Delhi, and thence to Calcutta, but this circumstance prevented them. They had strong letters of recommendation from DOST MUHAMMED of Kábul to SULTAN MUHAMMED KHAN of Peshawar, &c. They were generally liberal and well-informed. The young man had read most of the Persian classics, and spoke Persian very well. They were much astonished at every thing they saw at Bombay, which they compared to the Chinese city of Yarkend. I took them a trip in the small steamer, which they considered as the work of magic, nor could I explain the effects of steam so as to remove that idea. His Majesty's ship *Melville*, being in the harbour, I carried them on board her. At first they could not be persuaded that it was a ship: they thought it was a wooden fortress, erected on the bottom of the sea, by some extraordinary power. Subsequently, however, when they found she actually floated, they were more astonished at what they called the great boat, for they had no word to express a ship in their language, nor had they even seen any thing larger than the ferry boats on the Oxus, and the country vessels in which they came to Bombay. Different from most Asiatics, they shewed a great deal of curiosity, and examined every thing narrowly: they measured the ship by the number of paces they took, and the cannon ball by its apparent weight; but what astonished them most of all was the firing cannon with a lock like that of a gun, and ignition as produced by a percussion tube. A native having illuminated his house with gas, I took them to see it: here again they could not account for such an effect, except as produced by magic; they frequently expressed a wish that some Englishman would come to their country, and professed their readiness to assist him in penetrating even into Chinese Tartary; but they said that it would be next to impossible to enter China properly.

they invariably spoke of China by the name Kathái (cathay) and the emperor as the Khákhán. Russia, they called Urús. They were highly amused at the races, but said theirs which are held once a year were very superior. The English ladies they admired very much, but asserted their own were as fair and had more colour. The dress of the Usbeks is generally a small round cap of ermine, a large flowing robe with an under dress and broad flowing trowsers; like the Usmanloos they wear a broad leathern belt round the waist. When they go out they always wear boots of black or shagreen leather; their arms were Chinese short swords, and matchlocks with Russian barrels and daggers.

They mentioned the fact of dreadful earthquakes having occurred in their country about three or four years ago. The Cholera also had extended its ravages to the territory of their Khan.

It is proper that I should state that this information was collected casually and in the course of many conversations I had with these persons; there may be some exaggeration, but I believe it may generally be depended upon. The Usbeks are a very straightforward, honest, and simple people, very unlike the Persians or other Asiatics, and much more approaching in their disposition and manners to Europeans. With regard to the rebellion of JEHANGIR KUOJEU in Chinese Tartary, the truth of what they stated was fully borne out and verified by Mr. LINDSAY, the late Secretary to the Select Committee at Canton.

In order to give a correct idea of the geographical situation of the kingdom of Kokan, I have appended to this memoir a map\* of Central Asia, drawn up from the best authorities within my reach. The following genealogical table will also be useful, to shew the descent of **UZBEK**, the founder of this horde, from **CHENGÍZ KHAN**.



The tribes collected by **UZBEK** conquered Transoxiana, &c.

The **NOGHAI** horde was subdued by the Russians, and these Tartars are now scattered throughout Siberia.

\* We regret being obliged to omit this map, which however necessarily contains no matter new to geography, beyond perhaps the extension of the sway of the **KHAN** of Kokan, as far north as the river Irtysh. Any good map of Central Asia will be sufficient to elucidate the memoir.—ED.

II.—*Note of a Pilgrimage undertaken by an Usbek and his two Sons from Khokend or Kokun, in Tartary, through Russia, &c. to Mecca. Obtained in conversation with the parties, by W. H. WATHEN, Esq. &c.*

About fourteen years ago, A. D. 1820. our father had a house and small estate in the city of Kokan: this he sold for four hundred goldpieces, (a tila of Kokan is equal to about eight rupees,) or rather more than three thousand rupees, and having determined to abandon worldly cares, and commence a religious life, he took leave of all his friends and relations, and proceeded on a journey, with the view of performing a pilgrimage to the sacred cities of Mecca and Medina. We went from Kokan to Táshkend, which is eight days journey of a caravan: this is a large city, enclosed with a wall, and had been lately taken by our king from YUNIS KHOJA'S sons; their father had held it as a fief from our government. At Táshkend we waited some days, until the caravan for Russia took its departure: the caravan consisted of about 50 or 60 persons, mostly Bokhára and Táshkend people. From Táshkend we then proceeded to a fortified town, called Turkistán, of rather smaller consequence than Táshkend. Leaving this city, we arrived in about ten days at a small place named Sozák. After this, we saw no more fixed habitations, until we had entered the Russian territory. The country consisted of immense Steppes of pasture land, the grass growing to a prodigious height, and it was occupied by hordes of Kuzzáks, who dwelt in small black tents, and ranged about from place to place. After passing through the hordes of Kuzzáks subject to our sovereign, we arrived at the river called the Kúk-Sú, and on crossing it found the country occupied by Kuzzáks, dependent on the Russian king, (A'k Padshah, or White King.) We then arrived at a small place called Shumí: here the Russians collected a toll from the people of the caravan; but on being told we were pilgrims, they left us alone: the caravan dispersed at Shumí. We staid at this town two months, and lodged with a Nogai Tartar. We were two months on our journey from Tashkend to the Russian territory. We hired three kibitkas from the Nogais, and went in fifteen days to Omsk, which is a large fortified town. The Russian soldiers, dressed like yours, stopped us at the gates, but on being told we were pilgrims, allowed us to pass. We staid ten days there with a Nogai. We got a passport in the Russian language, from a great man, whom they called General; he had long festoons of gold hanging from his shoulders, and was dressed in black (dark-green). We left Omsk, and after passing through many places, the names of which we do not remember, we arrived at a very large and ancient city, called Kazán. We were allowed to pass at the gates on shewing the passport we had obtained at Omsk. We travel-

led in kībitkas, or carriages drawn by one horse. We staid four months at Kazán, during which was the month of Ramazan; we lived with a Nogai Tartar. We resolved to go by water thence to Astrakhán, (the journey by land takes forty days.) At about one hour's distance from Kazán, we came to a large river\*, and we embarked with several other merchants, Tartars, and Russians, on board a large boat about the size of a patéla; the owner of the boat was a Russian. About half way to Astrakhan, on the right bank of the river, our boat came to anchor off a large town named Sarat, where we staid six days: this town is smaller and more modern than Kazán. We then embarked, and arrived at Astrakhan in about forty-four days after leaving Kazán. We were stopped at the gates by the guard; after examining our passport, they let us pass; they were dressed like your people, except that their clothes were black (meaning dark-green). We staid one month with a Nogai there, as it was winter, and the country difficult to travel, owing to the snow and ice. After this, we hired kībitkas, and in twenty days arrived at a town where the Sultan of the Nogais resides. We cannot correctly recollect the name of the place, but it was something like Evel. Three days journey from thence, we met with a river or branch of the sea, where was a Russian fort, with a small detachment of military; our passport was again looked at. We then crossed over and came to a desert of one day's journey in the carriages aforesaid; after which, we reached a village of the Cherkes (Circassians): they gave us a guide who brought us to a Muhammedan village, whence we went with a caravan to Hunufa (Hanapa). We had now entered the Roman (Turkish) territories. After a stay of ten days at that place, we took ship, and arrived safely at Rím (Constantinople); here we hired a house for three or four ruppees per month, staid in that city four months, and passed over in a boat to Eskudari. We here purchased horses, and proceeded on horseback through many villages and towns until after forty or fifty days, we arrived at Shám (Damascus). We hired a house in this city, where we staid some time. We wished to visit Jerusalem, but the country was in such a disturbed state, that we could not go for fear of the plundering Arabs. We then travelled to a town called Ghaza, and thence to Elarish, whence we went in twenty-five days to Cairo, the capital of Egypt; here we hired a house and remained three months. We then left for Suez, which port we reached on camels in four days; here we embarked on board a vessel, and arrived at Judda in seventeen days. We put on the dress of pilgrims on board ship four days before we arrived at Judda. We reached Mecca in two days on camels; arrived there in the month of Ramzán. We hired a house there at four dollars

\* The Volga.

per mensem, and after the pilgrimage was performed, we went with a caravan to Medina, where we arrived in twelve days. From Medina we came to Yambo, a sea-port; thence we took ship to Cossier, thence in four days we reached Kenneh; we then dropped down the Nile to Cairo, whence we went to Alexandria; there we took ship, and sailed to a place called Adania; we thence journeyed to a town called Katahia, thence to Bursa, then to another town called Adania, Scutari, and Rúm. At Constantinople we were directed by the Scutan's minister to apply to the Russian ambassador for another passport. We took ship and arrived at Taridska\*. Here we saw a large Russian fort. Thence we came to Astrakhan, from which place we proceeded round the head of the Caspian to the city of Orenbourg; thence we went to a place called Kezziljer, the last town in the Russian territories. About twelve or thirteen days after passing through the hordes of wandering Kuzzáks, we crossed the Kúk-Sú river, and happily re-entered our prince's territory. On both sides this river are hordes of roving Kuzzáks; those to the north are under Russia, to the south under our king. The river is very broad, and at times very full of water; its current is very strong. We arrived after thirty days on camels at Sozák; hence we bent our steps to Turkistan, Tashkend, and Kokan. When we arrived, the KHÁN, our king, had just returned from his campaign in Chinese Tartary; whither he had gone to assist JEHANGÍR KHOJA WANG. JEHANGÍR KHOJA was no rebel, as treated by the Chinese. His ancestors were the sovereigns of the country before the Chinese conquered it, that is of Kashgar. Our prince in some degree failed in his expedition against the Chinese; this was owing to JEHANGÍR KHOJA'S not joining him cordially. Our prince could not infuse confidence into his mind, and JEHANGÍR wanted to conquer the country for himself. The consequence of that campaign, however, was that the Chinese agreed to our king's supremacy over their Muhammedan subjects; on the other hand, he is to keep the country in order, and be responsible for the Kirghiz and Muhammedan population. After our return, our father waited on the SHEKH-UL ISLAM, who paid him great attention, as did all the ulema, and people in general; but his other four sons died, on which he set out with us and our mother on a second pilgrimage, both our parents being determined to leave their bones in the holy land. Our good father however died at Somnány. In the first instance our 400 tilas (gold pieces) carried us to Mecca. After all our expenditure there, we had one hundred† left, and on this we subsisted on our way back. We were seven years in performing our first pilgrimage, and returning to our own country. We had no anxiety about being short in cash, as we knew

\* Taganrog?

† Rupees 800.



we had God for our protector, and that he would bring us through all adversities, according to his holy and immutable decrees.

The two young men, from whom I gleaned the above particulars, came to Bombay in the suite of the vazīr of Kokan; their names were HAJÍ SHAH KU'LÍ and HAJÍ SHAH KALENDER; they were very young when they performed the pilgrimage, being now only about thirty and twenty-six years of age respectively. They have received a very good education, having a good acquaintance with the principal Persian authors, and are well versed in Muhammedan science; their father was a Mulla or Doctor of Law, and received his education partly at Kokan, and partly at Bokhara; he also travelled to Kabul to become initiated in Súfeism by a famous nakshbandy pír or seer of that place.

III.—*European Speculations on Buddhism.* By B. H. HODGSON, Esq.  
C. S. Resident at Nipal, &c.

In the late M. ABEL REMUSAT'S review of my sketch of Buddhism, (*Journal des Savans*, Mai, 1831,) with the perusal of which I have just been favoured by Mr. J. PRINSEP, there occurs (p. 263) the following passage: “ L'une des croyances les plus importantes, et celle sur laquelle l'essai de M. Hodgson fournit le moins de lumières, est celle des avéneimens ou incarnations (*avatára*). Le nom de *Tathágata* (avenu\*) qu'on donne à SAKIA n'est point expliqué dans son mémoire; et quant aux incarnations, le religieux dont les reponses ont fourni la substance de ce mémoire, ne semble pas en reconnoître d'autres que celles des sept Bouddhas. Il est pourtant certain qu'on en compte une infinité d'autres; et les lamas du Tibet se considèrent eux mêmes comme autant de divinités incarnées pour le salut des hommes.”

I confess I am somewhat surprised by these observations, since whatever degree of useful information relative to Buddhism my essays in the *Calcutta* and *London Transactions* may furnish, they profess *not* to give *any*, (save *ex vi necessitatis*) concerning the ‘ véritable nonsens’ of the system. And in what light, I pray you, is sober sense to regard “ une infinité” of phantoms, challenging belief in their historical existence as the founders and propagators of a given code of laws? The *Lallita Vistara* gravely assigns 505, or according to another copy, 550, *avatárs* to SAKYA alone. Was I seriously to incline to the task of collecting and recording all that is attributed to these palpable *nonentities*? or, was it merely desired that I should explain the rationale of the doctrine of incarnation? If the latter only be the desideratum, here is a summary recapitulation of what I thought I had already sufficiently explained.

\* A radical mistake; see the sequel.

The scale of Bauddha perfectibility has countless degrees, several of which towards the summit express attributes really divine, however short of the transcendental glory of a *tathágata* in *nirvritti*. Nevertheless, these attributes appertain to persons subject to mortal births and deaths, of which the series is as little limited as is that scale of cumulative merits to which it expressly refers. But, if the scale of increasing merits, with proportionate powers in the occupiers of each grade, have almost infinite extent, and yet mortal birth cleave to every grade but the very highest, what wonder that men-gods should be common? or, that the appearance again in the flesh, of beings, who are far more largely gifted than the greatest of the *devatas*, should be called an *avatár*? Such *avatárs*, in all their successive mortal advents till they can reach the estate of a *tathágata*, are the *arhantas*, and the *bodhísatwas*, the *pratyéka* and the *svárika-Buddhas*. They are gods and far more than gods; yet they were originally, and still quoad birth and death are, mere men. When I stated that the divine Lamas of Tibet are, in fact, *arhantas*; but that a very gross superstition had wrested the just notion of the character of the latter to its own use, I thought I had enabled every reader to form a clear idea of that marvel of human folly, the immortal mortals, or present palpable divinities of Tibet! How few and easy the steps from a theory of human perfectibility, with an apparently interminable metempsychosis, to a practical tenet such as the Tibetans hold!

But REMUSAT speaks of the incarnations of the *tathágatas*: this is a mistake, and a radical one. A *tathágata* may be such whilst yet lingering in the flesh of that mortal birth in which he reached this supreme grade;—and here, by the way, is *another* very obvious foundation for the Tibetan extravagance—but when once, by that body's decay, the *tathágata* has passed into *nirvritti*, he can never be again incarnated. The only true and proper *Buddha* is the *Maha Yániku* or *Tathágata Buddha*. Such are all the '*sapta Buddha*;' of whom it is abundantly certain that *not one* ever was, or by the principles of the creed, could be, incarnated. SAKYA'S incarnations all belong to the period preceding his becoming a *Tathágata*. Absolute quietism is the enduring state of a *Tathágata*: and, had it been otherwise, Buddhism would have been justly chargeable with a more stupendous absurdity than that from which REMUSAT in vain essays to clear it. '*Plusieurs absolus—plusieurs infinis*' there are; and they are bad enough, though the absolute infinity be restricted to the fruition of the subject. But the case would have been tenfold worse had activity been ascribed to these beings; for we should then have had an unlimited number of infinite ruling providences! The infinite of the Buddhists is *never* incarnated; nor the finite

of the Brahmans. *Avatárs* are an essential and consistent part of Brahmanism—an unessential and inconsistent part of Buddhism: and there is always this material difference between the *avatár* of the former and of the latter, that whereas in the one it is an incarnation of the supreme and infinite spirit, for recognised purposes of creation or rule; in the other, it is an incarnation of a mere human spirit—(however approximated by its own efforts to the infinite) and for what purpose it is impossible to say, consistently with the principles of the creed. I exclude here all consideration of the *dhyáni*, or celestial Buddhas, because REMUSAT'S reference is expressly to the seven *múnushi* or human ones.

The word *tathágata* is reduced to its elements, and explained in three ways—1st, *thus gone*, which means gone in such a manner that he (the *tathágata*) will never appear again; births having been closed by the attainment of perfection. 2nd, *thus got or obtained*, which is to say, (cessation of births) obtained, degree by degree, in the manner described in the Buddha scriptures, and by observance of the precepts therein laid down. 3rd, *thus gone*, that is, gone as it (birth) came—the pyrrhonic interpretation of those who hold that doubt is the end, as well as beginning, of wisdom; and that *that* which causes birth, causes likewise the ultimate cessation of them, whether that 'final close' be conscious immortality or virtual nothingness. Thus the epithet *tathágata*, so far from meaning 'come' (*avenu*), and implying incarnation, as REMUSAT supposed, signifies the direct contrary, or 'gone for ever,' and expressly announces the impossibility of incarnation; and this according to all the schools, sceptical, theistic, and atheistic.

I shall not, I suppose, be again asked for the incarnations of the *tathágatas*\*. Nor, I fancy, will any philosophical peruser of the above etymology of this important word have much hesitation in refusing, on this ground alone, any portion of his serious attention to the 'infinite' of Buddhist *avatárs*, such as they really are. To my mind they belong to the very same category of mythological shadows with the infinity of *distinct Buddhas*, which latter, when I first disclosed it as a fact in relation to the belief of these sectaries, led me to warn my readers "to keep a steady eye upon the authoritative assertion of the old scriptures, that SAKYA is the 7th and last of the *Buddhas*†."

The purpose of my two essays on Buddhism was to seize and render intelligible the *leading* and *least* absurd of the opinions and practices of these religionists, in order to facilitate to my countrymen the study of

\* To the question, what is the *tathágata*, the most holy of Buddhist scriptures returneth for answer, 'It does not come again, it does not come again.'

† Asiatic Researches, vol. xvi. p. 445.

an entirely new and difficult subject in those original Sanscrit authorities\* which I had discovered and placed within their reach, but no living interpreters of which, I knew, were accessible to them, in Bengal or in Europe.

I had no purpose, nor have I, to meddle with the interminable sheer absurdities of the Bauddha philosophy or religion ; and, had I not been called upon for *proofs* of the numerous novel statements my two essays contained, I should not probably have recurred at all to the topic. But sensible of the prevalent literary scepticism of our day and race, I have answered that call, and furnished to the Royal Asiatic Society, a copious selection from those original works which I had some years previously discovered the existence of in Nipal. I trust that a further consideration of my two published essays, as illustrated by the new paper just mentioned, will suffice to remove from the minds of my continental readers most of those doubts of REMUSAT, the solution of which does not necessarily imply conversancy on my part with *details as absurd as interminable*. I cannot, however, be answerable for the mistakes of my commentators. One signal one, on the part of the lamented author in question, I have just discussed : others of importance I have adverted to elsewhere : and I shall here confine myself to the mention of one more belonging to the review from which I have quoted. In speaking of the classification of the people, REMUSAT considers the *vajra acharya* to be laics ; which is so far from being true that they and they alone constitute the clergy. The *bhikshuka* can indeed perform some of the lower offices of religion ; but the *vajra acharya* solely are competent to the discharge of the higher ; and, in point of fact, are the only real clergy. That the distinction of *clerus et laicus* in this creed is altogether an anomaly, resulting from the decay of the primitive asceticism of the sect, I have endeavoured to shew elsewhere, and cannot afford room for repetition in this place. •

The critics generally have been, I observe, prompt to adopt my caution relative to local superstitions, as opposed to the original creed of the Bauddhas. But they have carried their caution too far, and by so doing, have cast a shade of doubt and suspicion over things sufficiently entitled to exemption therefrom. Allow me, then, to reverse the medal,

\* Nearly 50 vols. in Sanscrit, and four times as many in the language of Tibet, were sent by me to Calcutta between the years 1824, and 30. The former had never been before heard of, nor the latter possessed, by Europeans.

[See the notices of the contents of the Tibetan works and their Sanscrit originals by M. CSOMA DE KÖRÖS, and by Professor H. H. WILSON in the 3rd vol. Gleanings, and 1st vol. Journal. As. Soc.—Ed.]

and to shew the grounds upon which a great degree of certainty and uniformity may always be presumed to exist in reference to this creed, be it professed where it may.

Buddhism arose in an age and country celebrated for literature ; and the consequence was, that its doctrine and discipline were fixed by means of one of the most perfect languages in the world (Sanskrit), during, or immediately after, the age of its founder.

Nor, though furious bigots dispersed the sect, and attempted to destroy its records, did they succeed in the latter attempt. The refugees found, not only safety, but protection, and honour, in the *immediately* adjacent countries, whither they safely conveyed most of their books, and where those books still exist, either in the original Sanscrit, or in most carefully-made translations from it. The *Sata Sahasrika*, *Prajna Paramita*, and the nine *Dharmas*, discovered by me in Nipal, are as indisputably original evidence of Buddhism as the *Védas* and *Puránas* are of Brahmanism. The *Káhgyur* of Tibet has been *proved* to have been rendered into Tibetan from Sanscrit, with pains and fidelity : and if the numerous books of the Burmese and Ceylonese be not originals, it is certain that they were translated in the earlier ages of Buddhism, and that they were rendered into a language (high Prakrit) which, from its close affinity to that of the original books of the sect, (Sanskrit,) must have afforded the translators every facility in the prosecution of their labours.

But if the Buddhists, whether of the continent or islands of India, or of the countries beyond the former, still possess and consult the primitive *scriptures* of their faith, *either in the original language, or in careful translations, made in the best age of their church*—wherefore, I would fain know, should European scholars, from their study, incessantly prate about mere *local* rites and opinions, constituting the substance of whatever is told to the intelligent traveller by the present professors of this faith in diverse regions,—nay, constituting the substance of whatever he can glean from their books? In regard to Nipal, it is just as absurd to insinuate, that the *Prajna Paramita*, and the nine *Dharmas* were composed in that country, and have exclusive reference to it, as to say that the Hebrew Old, or Greek New, Testament was composed in and for Italy, France, or Spain exclusively. Nor is it much less absurd to affirm, that the Buddhism of one country is *essentially* unlike the Buddhism of any and every other country professing it, than it would be to allege the same of Christianity.

Questionless, in the general case, documentary is superior to verbal evidence. But the superiority is not without limit : and where, on the one hand, the books referred to by our closet students are numerous and difficult, and respect an entirely new subject, whilst, on the other

hand, our personal inquirers have time and opportunity at command, and can question and cross-question intelligent witnesses, the result of an appeal to the living oracles will oft times prove as valuable as that of one to the dead.

Let the closet student, then, give reasonable faith to the traveller, even upon this subject; and, whatever may be the general intellectual inferiority of the orientals of our day, or the plastic facility of change peculiar to every form of polytheism, let him not suppose that the living followers of Buddha *cannot* be profitably interrogated touching the creed they live and die in; and, above all, let him not presume that a religion fixed, at its earliest period, by means of a noble written language, has no identity of character in the several countries where it is now professed, notwithstanding that that identity has been guarded, up to this day, by the possession and use of original scriptures, or of faithful translations from them, which were made in the best age of this church.

For myself, and with reference to the latter point, I can safely say that my comparisons of the *existing* Buddhism of Nipal, with that of Tibet, the Indo-Chinese nations, and Ceylon, as reported by our local inquirers, as well as with that of *ancient* India itself, as evidenced by the sculptures of Gya\*, and of the cave temples of Aurungabad, have satisfied me that this faith possesses as much identity of character in all times and places as any other we know, of equal antiquity and diffusion†.

\* See the explanation of these sculptures by a Nipalese Buddhist in the Quarterly Oriental Magazine, No. XIV. pp. 218, 222.

† As a proof of the close agreement of the Buddha systems of different countries, we may take this opportunity of quoting a private letter from Colonel BURNES, relative to the 'Burmese Philosopher Prince,' MEKKHARA MEN, the king of Ava's uncle.

"The prince has been reading with the greatest interest M. CSOMA DE KÖRÖS's different translations from the 'Tibet scriptures in your Journal, and he is most anxious to obtain the loan of some of the many Tibetan works, which the Society is said to possess. He considers many of the Tibetan letters to be the same as the Burmese, particularly the *b, m, n,* and *y.* He is particularly anxious to know if the monastery called Zedawuna still exists in Tibet, where according to the Burmese books, GODAMA dwelt a long time, and with his attendant ANANDA planted a bough which he had brought from the great *pipal* tree, at Buddha-Gaya. The prince is also anxious to know whether the people of Tibet wear their hair as the Burmese do? how they dress, and how their priests dress and live? The city in which the monastery of Zedawuna stood, is called in the Burmese scriptures *Thawotthi*, and the prince ingeniously fancies, that Tibet must be derived from that word. The Burmese have no *s*, and always use their soft *th*, when they meet with that letter in *Pali* or foreign words—hence probably *Thawotthi* is from some Sanscrit name Sawot. I enclose a list of countries and cities mentioned in the

P. S.—Whether REMUSAT'S ' *avenu*' be understood loosely, as meaning come, or strictly, as signifying come to pass, it will be equally inadmissible as the interpretation of the word *Tathágata*; because *Tathágata* is designed expressly to announce that all reiteration and contingency whatever is barred with respect to the beings so designated. They cannot come: nor can any thing come to pass affecting them\*.

And if it be objected, that the mere use of the word *avenu*, in the past tense, does not necessarily imply such reiteration and conditional futurity, I answer that REMUSAT clearly meant it to convey these ideas, or what was the sense of calling on me for the successive incarnations of these *avenus*? It has been suggested to me that *absolu*, used substantively, implies activity. Perhaps so, in Parisian propriety of speech. But I use it merely as opposed to relative with reference to mere mortals; and I trust that the affirmation—there are many absolutes, many infinites, who are nevertheless inactive—may at least be distinctly understood. I have nothing to do with the reasonableness of the tenet so affirmed or stated, being only a reporter.

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IV.—*Geological Section across the Valley of the Nerbudda, from Tendukhéri to Bittoul.* By J. G. SPILSBURY, Esq. Ben. Med. Est. Plate XXIII.

In your No. for November last, you expressed a wish that some one should give you a section of the geological features of the country from Tendukhéri to the hills south of the Nerbudda. Opportunity has been afforded me of making such a trip, and as probably you may not receive an account from one versed in the subject, I send you such notes as I made on the excursion, together with specimens of the rocks met with.

The conical hill to the S. E. near Tendukhéri is the point from which I started, the same to which Captain FRANKLIN alludes in the 1st part of the Transactions of the Physical Class of the Asiatic Society, and which he describes as being capped with basaltic columns.

The specimens from this hill are T 1, forming a platform with T 1 *a* mixed in detached pieces. Above the platform are trap boulders reaching Burmese writings, as the scene of GODAMA'S adventures, to which if the exact site and present designation of each can be assigned from the Sanscrit or the Tibet authorities, it will confer an important favor on Burmese literati." It is highly interesting to see the spirit of inquiry stirring in the high places of this hitherto benighted nation. The information desired is already furnished, and as might be expected, the Burmese names prove to be copied through the *Prakrit* or *Pali*, directly from the Sanscrit originals, in this respect differing from the Tibetan, which are translations of the same name.—ED.

\* *Avenu* signifies *quod evenit, contigit*, that which hath happened.—(*Dictionnaire de Trevoux.*) *Tathágata*; *tathá* thus (what really is), *gata* (known, obtained).—(WILSON'S Sans. Dict.)—ED.

to within some 50 or 60 feet of the summit where the columns T 2 are found. On coming to which, one would almost fancy that some vast temple had been thrown down by an earthquake. At the very top T 3 was lying—(see Pl. XXIII. fig. 1.)

From this hill to Beltari Ghát, on the Nerbudda, is a distance of about 10 miles, the first part of the road much intersected by ravines of the Baranj, a considerable nalá rising in the hills north of Tendukhéri; after which is the black alluvial soil of the valley, until you approach the Nerbudda. About a mile to the east of Beltari, in a water-course of one of the ravines I obtained the accompanying fossil remains\*, the matrix of which is (S C Bel) a conglomerate, very similar to the one forwarded with the fossils from Segouni, on the Omar nadí near Umaria. This conglomerate forms also the bed of the river at this Ghat (Bel. 1.) but is so friable and little coherent that it is difficult to procure a specimen; it is also accompanied by the same nodules, (vide Bel. 2.)

On crossing the Nerbudda, about a mile inland, in a south-east direction, a low detached range of hills, some four or five miles in extent, rising to the highest perhaps 200 feet, is met with B H 1; first occurring at the bottom of a ravine distant some 2 or 300 yards from the range: the strata running nearly east and west, with veins of quartz (B H 2) traversing in the same direction, varying from a line to upwards of two inches breadth. Near is seen the same conglomerate (S C Bel.) of the opposite side of the river, and which appears to me to be spread over a considerable extent of country, if it be the same as mentioned by Captain FRANKLIN, as occurring at Janee Ghat. I have found it in several places along the course of the Nerbudda, as far as Hoshungabad, and one specimen I picked up in the bed of the Dahi, near Gurawára proper.

From this low range to Futtehpoor, the country presents no particular feature for the geologist. Near all the rivers, and nalás, ravines abound: generally a light soil mixed with kankar, on which is grown † cotton, kodo, urhur, jawár, and rain crops. At a greater or less distance from the ravines, the rich black soil of the valley prevails, fitted for gram, wheat, and rubeec crops in general.

As from this point I proceeded to visit one of the hot-springs, I shall here insert my remarks on the westernmost of them.

It is situated some 14 miles, in a westerly direction from Futtehpoor, about four miles in a S. S. E. one from the village of Kyrie, belonging to Lala Thakur. A short distance before reaching the spring,

\* The upper jaw of a horse.—ED.

† My observation does not accord with that of Lieut. MILLS', (p. 65 of your Journal.) Great quantities are grown on the banks of the Heren and Nerbudda, but in soil as described above.



in crossing a small nalá (chiefly derived from these springs), the bed was formed by the specimens K 1, 2, and 3; No. 1 formed a small fall (see fig. 2,) and No. 2, intersected the strata running in a E. N. E. direction. No. 3 being the general bed of the river, and giving it a greyish appearance.

There are two springs, distant some five or six paces from each other, the southern one has been squared by stones being placed tank fashion, forming an area of about five feet each way: the other is left pretty much to nature; depth about a foot and half. Much gas is extricated, of an offensive sulphureous odour, temperature  $114^{\circ}$ ; that of the air  $86^{\circ}$ , time noon, (28th February, 1833.) At 12 paces distant, is a cold spring; the temperature of which I found to be  $82^{\circ}$ . Of the specimens accompanying, K 4 is the rock from which the springs issue; a pace or two above, K 5 juts out; K 7, is a rocky ledge just below the junction of the hot and cold springs; K 6, is a small detached hill, large masses of which are lying at the junction of the springs, on which are carved the *yoni*. In a water-course between the hill K 6, and the springs, lie large rolled pebbles of different colors, jasper, agate, and boulders of all sizes, precisely similar to those at Futtehpour (F. 1.)

Futtehpour (at which reside three Goand Rajas) is situated first within the gorge of the low range of hills that form the southern boundary of the valley of the Nerbudda. On passing through the town, which is built on both sides of the Unjon nála, the road winds through the low\* hills, varying from 150 to 200 feet in height, composed of F 2, capped with F 3. F 2 descends all the way, and is seen forming the bed of the nála; at one place where they crossed it, the rock puts on the appearance of a platform, covered with rough mortar, in which numerous small siliceous pebbles were mixed. In the nála and all about, are boulders of F 1, as at Kyrie hot spring. About six miles round the western end of Chuttair, the road up to this being undulated low jungle, the country becomes more open, and the soil changes from siliceous to decomposed trap, small hillocks and ridges of which are seen jutting up in this valley. The intermediate spaces, being the black alluvial soil similar to that of the Nerbudda, had crops of gram and wheat on them. About four miles from Maljihir S. S. E. near a small low range of hills (specimen M H) is the other hot-spring. The gas extricated is more offensive than the Kyrie one; temp.  $134^{\circ}$  air  $92^{\circ}$ ; time 2 P. M. (3rd March, 1834,) cold spring about 20 paces off,  $78^{\circ}$ . This spring bubbles

\* It is to be noted that although the hills are generally low, yet some high peaks, as Chuttair and Douria, (probably rising to 800 or 1000 feet above the plain,) are met with.

up much more than the other, and a greater volume of water issues. It has also been rudely enclosed, and at a short distance off is a Mahadeo temple in ruins. M S is the rock from which the spring issues, and M N is a ledge of rocks, and G the nála, some 200 yards off.

From Maljihir westward to Kunchari, a ridge of trap is traced, which crosses the river Deinwa at this place, and through which the river has cut its way; changed into the solid compact rock of D at K 1; a similar ledge being seen above the ford: the strata appear to run nearly east and west, with a dip of about  $30^\circ$ , in places traversed by thin veins of quartz and agate. D at K 3, forms the bed of the river at the ford, while large rolled conglomerates D at K 2, are thickly strewed in the bed, varying in size from a small pebble to large masses, a foot in diameter.

From this to Pugara is about nine miles. After leaving the Deinwa, the road is sandy, and a small ridge of sandstone is passed over, leading into a valley of black alluvial soil. up to the village of Singanama; from which commences what may be termed the Mahadeo Hills. The road is one unvaried ascent, but by no means steep, through a forest jungle, (scarcely any low bush jungle,) the rock of which is a sandstone, P 1, (and P 2, much intermixed with it,) the whole very practicable for all sorts of baggage, carts excepted. About seven miles from the river, the chief ascent in this march is attained, and the road keeps along the west of the ridge, which becomes more open and level up to Pugara, a small Goand village, belonging to a Thakur. The scenery about is very picturesque: a small nála, the Kanjundeo, is in front, and on every side fine large trees of mango, jamin, mahwa, semul, &c.; less than a mile to the eastward rises a small stream, the Kanjun Koor, which after a very small course falls over a precipitous rock, some 3 or 400 feet perpendicular; it has obtained the name of *Butkee Boorán*. Tradition saying that it derived its name from a young Goandee (it might add to the romance to style her lovely, but judging from the faces of this race in our days, it could not be the truth,) being forced over; however Miss Butkee has had her companions, as in the days of Goand rule, obnoxious individuals on being brought before their ruler, had the laconic sentence of "Shew him Butkee Boorán," passed on him. This nála, after winding through the hills, falls into the Deinwa at Pissun.

From Pugara to the table land of Puchmuree, the distance is about seven miles, the road being a series of rocky sandstone ledges, occasionally intersected by small streams; the road on the whole is very practicable for all sorts of laden cattle, there being but one or two places where even camels experience any thing like difficulty. On passing the last elevation, one of the Kodri range (being *the husks of the kodo* thrown aside by Mahadeo when resident here), you come to an open, rather level plain, of irregular size, the longest part probably not exceeding six miles

from Dobgur west to the Kanjee Ghatee, east, by five from the Pugara Ghatee to the cave at Mahadeo. There being no underwood or low jungle, this plain has much the appearance of a park; two or three streams wind through it in different directions.

The whole of these hills are almost entirely one rock, a sandstone (Dok 2) varying a little in color. I visited the top of one of the peaks, Dokgur\* by name, the same which is stated by Captain FRANKLIN to be 4800 feet high. On the pinnacle of this hill the pebbles were lying, evidently detached from the sandstone by the action of weather. These pebbles are to be seen in horizontal strata in many places, where the bare mural rock rises 300 or 400 feet from the plain. The only exception to this sandstone was, Dok 1, forming a water-course about 200 feet below the summit, and which is crossed once or twice in ascending to this peak, and Dok 3, about 150 feet from the summit.

In a cave, through which passed a stream, called Jumbo Dweep, the specimen of silicified tree was found by Captain OUSELEY, the description of which I give you in his own words.

“After having swam in as you know some 40 or 50 yards, with torches, where several passages appear to branch off, and not liking to go farther in water, the depth of which was great but unknown, I came back to the debris on which you stood, formed of broken masses from above, under which the stream runs. On descending with the stream by torch light about 20 feet through the sandstone excavated by the action of water, we came to a small room 10 feet square by 10 or 12 high, the stream falling by a crevice through the floor, about two feet wide. We descended about 15 or 20 feet more, and between the sides of the crevices was jammed the tree, a trunk with apparently stumps above, part of the bark, all fallen forward and caught in a hollow of the sandstone made by water: about 4 feet long by 18 inches wide, from 2 to 6 inches thick: of this I struck off the piece† I gave you, and have brought away the whole fragment, but not the tree, for what appeared was fully four feet wide, but how large it may be I did not carefully observe.”

Lieutenant FINNIS, in the Journal for February last, p. 79, appears to me to give a greater degree of extent to these hills, than my observation warrants. More than three sides of them are defined by the Deinwa, taking its rise between the peaks of Bhimgur and Dokgur, and to the westward of Dokgur a deep chasm immediately commences. Whether the geological formation differs on the side towards the Tek, I have no

\* There are two other peaks exceeding this in height, viz. Putta Sunkur, (above the cave of Mahadeo,) and Choura Deo, the highest of all which I conjecture to be about 5000 feet above the sea.

† The one I send.

opportunity of judging, but the Muttoor, divided from the Mahadeo range by the Deinwa and Kuttai nálas, is trap, and that formation is seen from Maljihir to Singanama, at which village the gradual ascent of these hills from the north commences. The steep side is from Bhawun (where the Jatra assembles at the annual festival of Shiv Ratri) : the ascent from this to the cave of Mahadeo (situated some 4 or 500 feet below the peak of Jutta Shunkur) is impassable for laden cattle, horses and elephants with difficulty getting up. Near Bhawun is to be seen a singular shaped hill (see fig. 3), from which all Goands firmly believe the locusts issue, hence its name Teri Kothí. Of the climate of these hills I annex a memorandum, received from Captain FRANKLIN in 1828 :—a season unusually hot on the Nerbudda and in the provinces, the thermometer in that month being at Cawnpoor 118° in the shade, and 144° Fahr, in the sun,

May 21.	Puchmuree,	Noon.	Barom.	26.50	Therm.	86.	Fine
	Peak of Dokgur,	5 p. m.	Ditto	25.50	Ditto,	85.	Do.
22.	Puchuree,	8 a. m.	Ditto	26.50	Ditto,	78.	cloudy.
33.	Jhirpa, close to Kunchuree on the Deinwa,	5 p. m.	Ditto	28.55	Ditto,	98.	

being at least 20° cooler than the valley at the hottest period of the day. Is it further confirmation of the coolness of these hills, that ferns and moss are to be seen very luxuriant from Pugara upwards? as I am not aware that we found them lower down. The animals are the same as on the plains, with exception of a beautiful squirrel, described by Major SYKES in his account of the mammalia\* of the Dukhun, and named by him "Sciurus Elphinstonii," his description accurately answering to a pair that Lieutenant WILLIAMS, 29th Native Infantry, and myself, procured. The Goands procure them in the mango season, a tree that pre-eminently flourishes wild in these hills; some trunks issuing from the crevice in the bare sandstone rock of three and even four feet diameter.

My route back was very much over the same ground, except that I examined the river much more to the eastward at Brimhan Ghat. The bed of the river is here formed of a conglomerate, (Br. Ghat,) in which probably the fossil lower jaw of the elephant which I forwarded to you formerly, was found†.

About a mile and a half up the river, the accompanying series of rocks were found from B K 1 to B K 2. Number 1 is first met with on the right bank, a slaty rock, with a dip of about 10° from the vertical, stretching in a north-east direction; next comes No. 2, in the same direction, changing into 3‡, with No. 4 intermixed. Close to the water's

\* Vol. i. Asiatic Journal, p. 165.

† See vol. ii. p. 583.

‡ Of this rock, great numbers of Yonis and Bulls are made, to adorn the temples in this vicinity.

edge, No. 5, the river here being narrowed by these rocks, forms a rapid ; Nos. 5 and 6, shelving down on each side. On the left bank, a rocky platform of considerable width rises from the water, at an angle of about 30° to the top of the bank, the strata running as before, consisting of Nos. 6, 7, 8, in places traversed by quartz 9 in contact with 8, 10 in large masses, 11 overlaying 10, some eight or ten inches thick ; after this to the top of the bank, 10 is seen traversed with much quartz varying from a line to considerable thickness.

About two miles, in a north-westerly direction, is the town of Chawur-puthur, with a low range of hills at the back of it; the stratification of which is nearly vertical, (Ch. 1,) running in a north-east to south-west direction. I traced it down towards the river, where in a nála it changes to Ch. 2, and then into Ch. 3, forming a ledge of rocks that cross the river at Ram Ghat, and at this point terminate my observations.

N. B. In the construction of the accompanying map, those places written in capitals are laid down from a map of this agency, sent up from the Surveyor's General's Office, on a scale of eight miles to an inch, and this is just half the size. The Tek, a station of the G. T. S. is laid down at per As. Journ. for February last, p. 7, but not according to the map appended, which I know to be erroneous\*. The six peaks and the Tek are all very conspicuous from the valley of the Nerbudda ; those two near Futtehpour, named Chutair and Dourea, are nothing in height compared to the others, probably not so high by 2000 feet ; but close to the valley they look high. Choura overtops all, and is probably not less than 5000 feet above the sea.

Segouní near to Umuría, is the village close to which the fossil bones were discovered, as described in the As. Journ. for November, 1833.

List of Specimens alluded to in the above paper.

*From the insulated hill near Tendukhéri.*

T 1	Silicio-calcareous conglomerate, tinged with lithomarge.		Bel. 2 nodule of kankar.
T 1 a	More compact, silicious limestone.	B H 1	<i>Low Hills South of the Nerbudda.</i> Silicious jasper conglomerate, with
T 2	Columnar basalt.	B H 2	Quartz veins.
T 3	Same as T 1.		<i>Khyrie Hot-springs.</i>
	<i>From Bellari.</i>	K 1	Calcareous basalt effervescing in acids, and leaving green wacken?
S C.	A pebble conglomerate with calcareous cement, same as that of Brimhan ghat.	K 2	Vein of calcareous spar in do.
	Fossil upper jaw of a horse found imbedded in it.	K 3	Silicious limestone like T 1 a.
		K 4	Stratified calcareous sandstone.
		K 5	Columnar basalt.

\* On referring to the map in question, we find that our lithographer has made a mistake of *ten miles* in laying down the position of the Tek station, as compared with the table of Lats. and Longs. in page 70. The map was compiled from two sketch maps by different officers, which differed in scale and in the position of many of the principal places.—ED.

K 6	Quartz sandstone.	Dok 3	White decomposing sandstones on summit, sandstone and large quartz pebbles.
K 7	Decomposing do. tinged green. <i>Futtehpour Hills.</i>		
F 1	Conglomerate of jaspers, silex and felspar, with calcareous cement.		<i>Mahadeo Cave, Soft sandstone. (Silicified wood in a stream within).</i>
F 2	Jasper conglomerate, with red clay cement.		<i>Nerbudda west of Brimhan ghát.</i>
F 3	Quartz vein. <i>Muljihir Hot-spring.</i>	B K 1, 2	Slate.
M H	Friable quartzose sandstone.	B K 3	More talcose do., green.
M N	More compact ditto.	B K 4	Still more compact, with calcareous veins.
M S	Ditto. <i>Deinwa River at Kuncharee.</i>	B K 5	Quartz tinged with 4.
D K 1	Compact basalt.	B K 6	Ditto, and with red spots.
D K 3	Conglomerate of half-rounded pebbles, with jasper cement.	B K 7	Clayey sandstone, with rounded pebbles, size of a pear.
D K 2	Decomposed sandstone. <i>At Pugara.</i>	B K 8	Silicious conglomerate.
P 1	Coarse-grained sandstone.	B K 9	Sandstone, with do.
P 2	Coarser do. with ochreous clay. <i>Dokgur Hills.</i>	B K 10	Ditto, with green earth.
Dok 1, 2	Basalt.	B K 11	Clayey sandstone, slaty. <i>At Chawurputhur.</i>
		Ch 1	Vertical columnar basalt.
		Ch 2	Do black flinty.
		Ch 3	Lighter, more quartz.

Accompanying these specimens were the following found by Captain OUSELEY, at the site of the coal discovered by him marked on the map. As this coal was brought to the notice of the Asiatic Society by Lieut. FINNIS, in 1829, (see p. 73, and by Captain COULTHARD before that time (see *As. Res.* xvii. 72,) it was not known to whom the discovery was rightly due. We are glad to see therefore that the subject is explained in the following note from Captain OUSELEY, to Dr. SPILSBURY, which accompanied the above geological notice.—ED.

“ I am between Jamgurh and Bhoragurh : a beautiful jungle scene. I found the strata in a dry nála, thus :

From 10 to 4 feet from the surface.	soft sandstone, friable.
9 inches,	coal, slaty.
6 inches,	marly stone, black.
1½ feet,	good coal.
6 inches,	soft micaceous shale.
below to the depth of 25 feet,	harder sandstones.

The strata dip to the west about one foot in a yard : I was in hopes of finding it nearly horizontal. I have commenced two shafts, and expect to find the real deposit about five feet below the last coal. The only water is in a fissure of this nála, not good : all jungle and hills around. On referring to my journal, I find I sent specimens of this coal on the 9th March, 1827, to Mr. MADDOCK, Captain COULTHARD, &c. and that I sent two servants with Lieutenant FINNIS, a year after, to point out the place. It was upon WESTON's mentioning to Captain COULTHARD that bits of coal were found occasionally in the Towa, that I sent the man, who traced it up to this place.”

V.—*Note on the Fossil Bones of the Nerbudda valley, discovered by Dr. G. G. Spilsbury, near Narsinhpúr &c. By J. PRINSEP, Secretary, &c. (See Plate xxiv).*

[Read at the Meeting of the 6th August.]

The circumstances of the discovery of the gigantic fossil bones now presented by Doctor SPILSBURY, were brought to the notice of the Society on the 30th October last\*. I should feel inclined in pointing to these splendid trophies, to repeat the obligations of Indian geology to this eminent cultivator of the science, but that his modesty will not allow me to designate him 'geologist,' although his zeal and enterprise in the systematic prosecution of geological inquiries, and his continued success in making known these treasures of the ancient world, treasures which had escaped so long the diligent search of professed geologists, have fairly won for him all the fame that the most enthusiastic disciple of the Wernerian hammer could covet.

Dr. SPILSBURY'S discoveries indeed forcibly exemplify the truth of the fable of "eyes and no eyes." As it was his conversation with the lime-burner that first brought to light the existence of the *Jabalpúr* fossil shells, so was it an humble native carpenter at *Narsinhpúr* from whom he obtained the knowledge of the *giant* at *Segauní*, which was followed up by an immediate visit to the spot, and the reaping of a rich harvest of discovery. Again, "on mentioning these fossil bones to the medical officer stationed at *Hoshangábád*," says Dr. SPILSBURY, in a private note to myself, "he told me there were *plenty* just below his house, and that he would shew them to me: off we went, and I flatter myself I brought away what you will deem a real acquisition—the head of a horned animal (buffalo?) imbedded in the stone. Dr. IRVINE had considered them of too recent formation to be worthy of much notice, but I thought differently, and so I submit them to those who are more cognoscent on the subject: claiming for myself no more credit in the matter beyond a wish to contribute to this very interesting science such discoveries as mere accidents have thrown in my way."

We should remember that the specimens, collected on these occasions, are not little hand samples, easily carried about, but bulky masses weighing from one to two maunds each; that they have to be conveyed 3 or 400 miles by land carriage over a difficult country before they can be embarked for another voyage of 600 miles to Calcutta. The care taken in packing them has however been so effectual, that I can safely say we see them now as they left the rocky conglomerate of the *Omar nadí* bank, from which they were detached nearly a year ago.

\* See Journ. As. Soc. vol. ii. p. 586.

More than this,—I believe, from an inspection of CUVIER's plates, that the two femurs of the elephant now on the table are as perfect as, if not superior to, any of the sort in the celebrated museum of Paris.

I will now hazard a few observations on the remains of the *Narsinhpúr* or *Segauni* elephant.

It may be looked upon as most fortunate that the two bones of this animal, selected for dispatch, are the right and left femora, since it is principally upon the conformation of the condyles of the femur that CUVIER has decided the specific difference of the fossil or extinct, from the existing, varieties of the elephant.

I stated on the examination of the fossil jaw-bone of another elephant from the *Brimhán Ghát* near *Jabalpúr*, side by side with a recent jaw in our museum, that it was impossible to discover any such distinction as should constitute a difference of species\*. But the case is very different now: the magnitude, as well as the peculiarities of structure, of the present animal, at once pronounce it to be the "mammoth," or *elephas primigenius* of BLUMENBACH. The head is not forthcoming to confirm this conjecture, having, according to the tradition of the village, been washed down the river seventy years ago: one tooth only was obtained from a Thákur in the neighbourhood, but that has not yet reached us:—Dr. Row (to whose care we are indebted for the dispatch of the specimens from Benares) writes, that he has sent it by another opportunity: however, the expressions and drawings of CUVIER accord so perfectly with the bone before us, that no reasonable doubt can be entertained even in the absence of the teeth. He thus describes its conformation:

"La tête inferieure du femur m'a fourni un caractère distinctif tres-sensible dans son *échancrure entre les deux condyles, qui se réduit à une ligne étroite,*" (see figures 5 and 6,) "au lieu d'un large enfoncement qu'on voit dans les deux espèces vivantes," (see figures 2 and 8.)

The peculiarity was remarked in the Siberian mammoth, in the fossil elephant of Constadt, in that of Florence, and in all others, indeed, which were examined by this eminent naturalist; and here we find the same characteristic in another individual at this distant part of the globe. Doctor J. TYTLER has obligingly furnished me with the femur of a modern elephant, to render the comparison more obvious. (It is depicted as fig. 1 of the plate, in an exact relative proportion to the fossil bones.)

Doctor TYTLER's bone belongs to a young animal, if the detachment of the epiphysis be taken as a test of its age; but the same detachment is apparent in the round head of the left fossil femur also (fig. 9,) and in the condyles of another very large specimen, distinct from the other

\* Vol. ii. p. 585.



two (figure 11); so that as far as regards age the fossil and recent bones are by no means unfit for a comparison of magnitude inter se. Judging from the plates of elephant skeletons, it appears that the height of the crown of the animal's skull from the ground is from  $3\frac{1}{10}$ , to  $3\frac{1}{2}$  of the length of the femur; and the height to the top of the shoulder is  $2\frac{3}{4}$  of this length; the latter is, I believe, the mode of estimating the height of the elephant.

The recent femur, measuring 40 inches exactly, would thus give an animal of nine feet high, which is by no means a small elephant in the present day; while the ratios between several measurements of the fossil and recent bone are as follows:

The length of the femur itself was fortunately taken by Dr. SPILSBURY, while it remained whole, and attached to the rocky matrix; otherwise the length deduced from the measurement of its parts alone would have needed some confirmation to obtain implicit credence.

	<i>Fossil Specimen from the Omar Nadi.</i>	<i>Skeleton of an elephant of 9 feet.</i>	<i>Ratio.</i>
Greatest length of the femur, between extremities, . . . . .	63 inches.	40 inches.	1.6
Circumference of the ball <i>a b</i> ,	27	16.5	1.6
Diameter of ditto ( <i>measured</i> .)	8.75	5.15	1.7
Breadth from tip of trochanter to exterior of ball, <i>a c</i> , . . . . .	18	11	1.6
Circumference of the central or smallest cylinder of the bone, . . . . .	19	11	1.7
Breadth of the condyles, ..	11	6.8	1.6

Mean ratio of the fossil to the existing species, 1.63

There is a very satisfactory agreement between all these measurements, and we may be warranted therefore in fixing as the height of our fossil animal  $9 \times 1.63$ , or  $14\frac{3}{4}$  feet: 15 feet was the estimate at first made from the proportion of the bones in CUVIER's work.

Thus, a femur of an African elephant 1.11 metre, or 43.7 inches long, denoted an animal of  $9\frac{3}{4}$  feet: and

The longest of the entire fossil bones accurately measured by CAMPER was 52 Rhenish inches, = 53.9, indicating a height of 12 feet 2 inches.

“ Si l'on pouvoit se fier aux mesures rapportées dans la *gigantomachie*, le femur du prétendu Teutobochus auroit été encore plus grand, puisqu'il auroit eu *cinq pieds* de long; et néanmoins cette dimension n'indiqueroit qu'un individu de quatorze pieds du haut: ce qui ne surpasse point ce que les relations nous disent des éléphants vivans dans les Indes.” It is evident from this passage, that no entire specimen of the magnitude of our fossil had been seen at Paris. There was in the

museum, however, the head of a femur from the Pyrénées measuring 8.6 inches in diameter, indicating an individual of 14 feet 8 inches according to CUVIER : a *tête inferieure* from the *Bog* belonging to an animal of 15 feet : and another from Montserrat of the same dimensions.

All of these support the measurement we have assumed of about 15 feet for our specimen, and prove it to be certainly one of the most complete, as well as one of the largest remains of this magnificent quadruped of which even the museums of Europe can boast.

None of the animal matter of these bones remains : it is replaced entirely by carbonate of lime, not by silex as was the case with the specimen of imbedded bone from *Brimhan Ghát*. In the hollow interior of the femur, long interwoven and pendent stalactites of calcareous matter have been deposited, which shew that the bone must have been incased in the rock in nearly a perpendicular position ; it is also remarkable that there are two series of these fibrous stalactites forming a considerable angle with one another, as if the position of the mass had been at one period altered. Towards the ends of the bones the cavity is entirely filled with the calcareous deposit.

Plate XXIV. represents different views of the two fossil femora in their relative proportion to the modern bone.

*References to the Plate.*

Fig. 1. Modern femur of a young elephant of 9 feet high.

Fig. 2. View of the lower end of ditto, to shew the separation between the condyles.

Fig. 3. Head of the left femur of the fossil species, broken off towards the shaft, but originally found united with

Fig. 4. The lower extremity of the same bone.

Fig. 5. Is a portion of the shaft of the same bone at the narrowest part : the stalactitic formation in the interior is partially visible at the lower extremity.

Fig. 6. End view of fig. 4, to shew the conformation of the condyles *united*, or *meeting*, as described in CUVIER'S *Ossements Fossiles*.

Figs. 7, 8. are from CUVIER'S Plate in *Oss. Foss.* vol. i. to shew their accordance with the above. 7, the fossil ; and 8, the existing, species.

Figs. 9, and 10, are the same fragments of the right fossil femur, viewed on the inside. They are in as perfect a state as the left femur, excepting that the epiphysis of the ball of the thigh is detached and lost. Its place is shewn by a dotted line.

Fig. 12. Is a petrified bone of still larger dimensions than the preceding, but not so well preserved. It seems from the curved depression at *h'*, and the rudiments of condyles at *f'*, *g'*, to be the lower end of a femur. This fragment weighs  $1\frac{1}{2}$  *mans*, and it is nearly one-fourth larger than *figs.* 4 and 10 ; *figs.* 12, 13.

*Fossil buffalo.*

With regard to the fossil skull, supposed by Dr. SPILSBURY to be that of a buffalo, from *Hoshangábád*, the same good fortune has in this instance also attended his discovery : for as the condyles of the

femur were chosen by CUVIER for one of the distinguishing types of the fossil elephant, so it happens that the forehead and skull, with or without the horns, are the only parts upon which reliance can be placed for determining the specific character of the ruminantia.

The present specimen is, with exception of the horns, as perfect as could be desired; the expanse of the forehead has its bony surface uninjured, shewing the suture along the middle, (which is a sign that the animal was not aged) and the attachment and bony process of the left horn. On the under side, the condyles of the occiput protrude through the stony mass; and by carefully chiselling away some of the stone, the position and form of the teeth on either side of the jaw have been exposed to view. All the interior of the skull is filled with the hard calcareous sandstone.

The direction of the horns in the *Hoshangábád* fossil skull give it at first sight the appearance of a buffalo's head: and the convexity and breadth of the forehead as well as the angle of the occiput, both tend to rank it with this genus: or at least certainly to separate it widely from the aurochs and the domestic ox, as described in the following perspicuous passage on the specific difference of these animals by the Baron CUVIER.

“Le front du *bœuf* est plat et même un peu concave: celui de l'*aurochs* est bombé, quoiqu'un peu moins que dans le *buffle*; ce même front est carré dans le *bœuf*, sa hauteur étant à peu près égale à sa largeur, en prenant sa base entre les orbites; dans l'*aurochs* en le mesurant de même, il est beaucoup plus large que haut, comme trois à deux. Les cornes sont attachées, dans le *bœuf*, aux extrémités de la ligne saillante la plus élevée de la tête, celle qui sépare l'occiput du front; dans l'*aurochs*, cette ligne est deux pouces plus en arrière que la racine des cornes; le plan de l'occiput fait un angle aigu avec le front dans le *bœuf*; cet angle est obtus dans l'*aurochs*; enfin ce plan de l'occiput quadrangulaire dans le *bœuf*, représente un demi-cercle dans l'*aurochs*. Ces caractères assignés à l'espèce du bœuf, ne sont pas seulement ceux d'une ou deux variétés; ils se sont trouvés constans, non-seulement dans tous nos bœufs et vaches ordinaires, mais encore dans toutes les variétés étrangères que nous avons examinées.”

Those acquainted with the comparative anatomy of the Indian species will be able to say whether these distinctions are here also equally marked, and consequently to pronounce at once on the character of the fossil skull. The latter has no point of resemblance to the fossil ox of the Mississippi, described and depicted in the second volume of the *Ann. Lyc. Nat. Hist. of New York*, page 280.

None of the fossil skulls, depicted in the *Ossemens Fossiles*, at all resemble the present specimen: neither do the dimensions of the

existing diminutive species of cattle bear any comparison to its magnitude. We have not in the museum the skull of a wild buffalo, which would best suit the purposes of comparison, and must therefore rest contented with reporting the exact dimensions and appearance of the specimen.

[After writing the above to be read at the meeting, Dr. EVANS was so obliging as to bring to the Society a very fine skull of a buffalo prepared by himself, which on being placed in juxtaposition with the fossil, accorded with it so entirely in character that no doubt could be entertained of their identity. In dimensions there was a considerable difference in favor of the fossil, but Dr. EVANS has another skeleton on a larger scale, so that the magnitude of the fossil is not so remarkable. He was inclined to think sufficient disparity existed in the arch of the forehead to constitute a variety of species. The absence of the horns however makes it impossible to decide this point.]

The following are the dimensions of the Jabalpur fossil head, as compared with Dr. EVANS' buffalo.

		<i>fossil.</i>	<i>modern.</i>
Forehead, between the sutures at the root of the horn processes,	12 in.	8 in.	
Length from the crown of the forehead to foremost molar tooth,	18 do.	13	
Width of jaw, from exterior of teeth, . . . . .	6½ do.	6	
Length occupied by molar teeth, . . . . .	7 do.	5.7	
Girth of horn process at the base, . . . . .	13 do.	10.5	
Depth of skull from the occiput to the head of the condyles, ..	8½ do.	8	
Diameter of the foramen magnum, . . . . .	2 do.	1.8	
Probable length of the head, . . . . .	26 do.	22	

The largest fossil cranium of an *ox*, in the Jardin des Plantes, is 11.8 inches from the crown of the occiput to the root of the nasal bone, which gives a total length of 25 inches, or somewhat less than ours: the circumference of the root of the horn was 13.4 or 0.4 larger than ours.

Taking for granted that the specimen belongs to the buffalo, it is the **FIRST FOSSIL BUFFALO** known to geologists: for although the bones of the ruminantia are found every where most abundantly in the fossil state, it has been always understood, as asserted by PIGEON, that "As yet no relic whatever has been found which resembles *any variety* of the Indian or the Cape buffalo." It has moreover been remarked as a singular fact, that while the fossil pachydermata, discovered in all parts of the world, the elephant, the rhinoceros, the hippopotamus, and tapir, all belong to the torrid zone; the whole of the fossil ruminants appertain precisely to the genera at present most common in the northern climates, the aurochs, the musk ox, the reindeer, &c.

It is well known that the bones of sheep, goats, antelopes, camelpards, (unless the conjecture by our curator regarding the specimen from the Jumna should prove to be true\*,) have never been met with in a fossil state, among the immense abundance of fragments carefully examined by CUVIER himself in the course of twenty years. None of these have yet been discovered among our Indian collections. It is necessary therefore to be most cautious in pronouncing upon our buffalo, until the discovery of his horns shall put the question of departure from the rules developed by the great teacher of the science of fossil osteology, beyond doubt: especially as we find from PIGEON that "one species of ox, which accompanies the elephant, has massive limbs and a cranium like the buffalo†."

One point may be looked upon as pretty certainly established by the discovery of the present head: namely, that the teeth of the ruminantia from other parts of the Nerbudda valley, and from the bed of the Jamna, which so exactly resemble these now found in situ, protruding from their rocky envelope, belong to the same animal: at least it is safe so to consider them, being desirable to avoid the multiplying of species, except on the strongest evidence.

Meanwhile, we should particularly direct the attention of our geologists of the Nerbudda, (or philo-geologists, if Dr. SPILSBURY will so have it,) to the neighbourhood of Dr. IRVINE'S house at *Hoshangábád*. The spot whence this skull was extricated will most likely be prolific of other riches in equally good preservation. They should be chiselled out of the rock by a skilful stone-cutter, to prevent injury, and at the same time, to take off as much of the rocky matrix as possible. A pair of buffalo's horns would indeed be a rich prize.

We see by the section of the Nerbudda, with which Dr. SPILSBURY has now favored the Society‡, that the calcareous gravelly conglomerate extends over a considerable portion of the valley at the foot of the cliffs:—four points, including the spot where the fossil jaw of a horse was picked up in making this very section from Tendukhéra, are now marked upon the accompanying sketch-map as the ascertained sites of fossil bone deposits. More will doubtless be discovered even by the persevering exertions of one individual; but a field of so great promise, were it in Europe, would not be left to such slow cultivation. It would be made the object of a special expedition of scientists (as they are called at Cambridge) from the Government, or from some geological association, and the impatience of theorists would soon be satisfied with a full

\* See Proceedings of the 3rd July, 1834.

† PIGEON'S Fossil Remains, p. 116.

‡ See the foregoing article.

history of the antediluvial or postdiluvial tenants of the Nerbudda fossil bason : for it is by no means clearly established yet to what epoch the debris belong. We have to learn whether the gravelly brescia ever *underlies* the alluvium, or any of the regular deposits of the valley ? or whether it merely fills up crevices and angles at the foot of cliffs, from which the trickling of springs charged with carbonate of lime might be derived. I have before remarked, that the conglomerate matrix contains rolled pebbles of quartz, felspar, and basalt, and therefore its formation is much subsequent to the deposit of the stœtz trap, the most recent of the regular rock deposits of the Sâgar district. The trap itself is of course anterior to the black alluvium of the Nerbudda valley, which is principally formed from its detritus. Is the brescia contemporaneous with this black alluvium or subsequent thereto ? is the question to be solved.

PROFESSOR BUCKLAND was unable to determine whether the Ava bones of mastodons, hippopotami, alligators, &c., were referrible to "the most recent marine sediments of the tertiary formation, like the elephant of the Norfolk crag ; or to the antediluvian fresh-water deposits analogous to those of the Val d'Arno ; or lastly to the *diluvial* accumulations more modern than either of these formations ;" but he inclined to refer them to the latter, because of the rolled gravel cemented to them, which resembled the matrix of many of the European mammalian fossils. So far the Ava fossils agree with those of central India, but they differ in being mineralized (at least such as we have lately received from Col. BURNEY) with hydrate of iron instead of carbonate of lime. Capt. MACLEOD however informs me, that such as were calcareous were rejected by Col. B., not being considered to be thoroughly fossilized.

But I must now quit this interesting subject, hoping shortly to recur to it, armed with additional facts from Sergt. E. DEAN, whose hippopotamus' tooth and other curious and new fragments from the Jamna were lately submitted to the Society, and whose notes are only withheld from publication in expectation of further information from the same source.

VI.—*Determination of the Errors of Division of the Mural Circle at the Madras Observatory, by T. G. TAYLOR, Esq. H. C. Astronomer, Fort St. George.*

[In a letter to the Editor.]

I beg to trouble you with the result of some observations which I lately made with a view of determining the amount of error of division of the Madras Mural Circle.

Hitherto (with but one exception I believe\*) it has been the practice of astronomers to avoid the effect of error of division by

\* PROFESSOR BESSEL.

employing a large number of divisions, and by occasionally shifting the zero point of the instrument to another set of divisions: the employment of several divisions at each observation is objectionable only as far as regards fatigue, and loss of time to the observer; but to the shifting of the zero point there are objections to be urged of a much more serious nature; it is true, in the determination of fixed angles, such as the altitude, or north polar distance of the fixed stars, the plan of shifting the zero point of an instrument is applied with some advantage, but in the determination of the ever-changing places of the sun, moon, and planets, the shifting of the zero point is of no avail whatever; and in the determination of parallax, of the coefficients of aberration, nutation, &c. to which a good set of observations are applicable, the plan cannot be employed at all. With this view of the subject, since the erection of the Madras Mural Circle, in January 1831, I have employed the circle *without* shifting the zero point: and this circumstance, added to the fact of the division of this instrument having been effected upon an entirely new plan, rendered it very desirable that some knowledge of the amount of error of division should be obtained; accordingly I set to work as follows.

It is well understood that parallel rays of light after passing through an object glass, converge and meet eventually at a point which is called the principal focus: the converse of this is, that rays of light which diverge from the focal point after passing through the object glass will pursue a parallel course, and hence will appear distinct when viewed through an astronomical telescope adjusted to the solar focus. To be better understood in what follows, I must here refer to the description of the Madras Mural Circle given in volume I. of the Results of the Madras Observations for 1831: it is there stated, that "the telescope is furnished, with an axis of its own, which works into the axis of the circle;" hence it will appear plain that the telescope being unclamped at the two ends from the circle, it moves on its own axis *independently* of the circle, or on being clamped *to* the circle, it moves *with it* at pleasure. Thus much being premised, I clamped the circle, so that 0 corresponded with the zero of the reading microscope A, and read off B, the opposite microscope; I then directed the telescope to the object glass of a DOLLOND'S five feet achromatic, in the focus of which I had previously fixed a pair of lines crossing one another at an angle of about  $30^\circ$ ; these lines which were distinctly seen, were bisected by the movable wire of the telescope, the telescope being first firmly clamped to the circle; the circle was now loosed, and moved with the *attached* telescope to the object glass of another telescope, (a 12 inch theodolite telescope for want of a better,) the cross wires of which

had been previously adjusted to subtend as nearly as possible an angle of 90° with the former ; the difference between the reading now obtained, and the first reading, gives the exact angle between the two, + or — error of division. The telescope being now released from the circle was again directed to the first-named telescope ; again clamped to the circle ; and, by means of the movable wire, a bisection again made ; releasing the circle, it was with the attached telescope again turned till the telescope bisected the wires of the smaller telescope, when 180° nearly, or double the angle subtended by the pairs of cross wires, was read off ; pursuing this course after five readings we arrived at the point of departure : now the difference between the first and last divided by four, or the true value of the angle, being added to the first reading gives the second ; being again added gives the third, &c. these compared with the actual reading give the error of division of the points 0°, 90°, 180°, &c. thus :—

A.			B.	Mean of A and B.	Mean Angle.	Interpolated.	Error of division.
0	'	"	"	"	" "	"	"
3	0	0.0	1.1	0.55	21 90—0.55	0.55	0.00
90	0	5.2	5.2	5.20	<u>4</u>	5.89	—0.69
180	0	10.7	12.2	11.45	"	11.23	+0.22
270	0	15.4	17.4	16.40	"	16.57	—0.17
360	0	22.9	20.9	21.90	=+5.34	21.90	0 00

From the mean of ten repetitions in this way the errors came out,

For 0° and 180° =	0.00
90 and 270	—0.45
180 and 360	—0.03

For the error of divisions intermediate between the above, I placed DOLLOND'S 5-feet Telescope as before, and by means of two wooden supports, A. B., a 42-inch Achromatic, by DOLLOND, was supported immediately above, so that a pair of cross lines fixed in the focus, subtended an angle of 30° with the cross-lines fixed in the other Telescope. I then made the following measures :

A.			B.	Mean of A and B.	Mean Angle.	Interpolated.	Error of division.
0	'	"	"	"	" "	"	"
0	0	0.0	1.9	0.95	18.50—0.95	0.95	0 00
30	0	5.0	7.0	6.00	<u>3</u>	6.80	—0.80
60	0	12.0	12.6	12.30	"	12.65	—0.35
90	0	18.6	17.5	18.05	=5".85	18.50	—0.45
In a similar manner.					" "		
90	0	0.0	59.2	59.60	1.88—0.05	0.05	—0.45
120	0	0.5	59.5	0.00	<u>3</u>	0.66	—0.66
150	0	1.7	59.8	0.75	"	1.27	—0.52
180	0	1.1	2.6	1.85	=0".61	1.88	—0.03



In this case to find the true angle subtended by the pairs of cross lines, it is necessary to apply to the mean of A and B the errors already found above for 0° and 180° and for 90°, and 270° and then to interpolate between these *corrected* readings: from the mean of ten measures in this way the errors come out as follows:

Error of division.

At 0° and 180°	0.00	This assumed = 0.
30 ——— 210	-0.26	
60 ——— 240	-1.00	
90 ——— 270	-0.45	found above.
120 ——— 300	-1.57	
150 ——— 330	-2.15	
180 ——— 360	-0.03	found above.

To ascertain the error of division at the points intermediate between 0° and 30° and between 30° and 60°, &c. I placed the 42-inch telescope by DOLLOND (already spoken of as the upper telescope) so near to the lower telescope, that the images of the pairs of cross-wires subtended an angle of five degrees nearly, and in a manner similar to that explained above, made the following measures of the angle:

Microscope A.			B.	Mean of A and B.	Mean of Pairs.	True angle.	Interpolated	Error of division.
°	'	"	"	"	"	" "	"	"
0	0	0.0	1.0	0.50	1.10	15.11--1.10	1.10	0.00
5	0	1.3	1.2	1.25	2.42	6	3.44	-1.02
10	0	3.0	3.0	3.00	4.85		5.78	-0.93
15	0	6.9	7.1	7.00	8.12		8.11	+0.01
20	0	8.2	11.0	9.60	10.32	"	10.45	-0.13
25	0	10.8	14.0	12.40	12.47	=2.335	12.78	-0.32
30	0	15.1	14.6	14.85	14.85		15.11	-0.26
25	0	11.9	13.2	12.55				
20	0	9.8	12.3	11.05				
15	0	9.1	9.4	9.25				
10	0	6.1	7.3	6.70				
5	0	3.5	3.7	3.60				
0	0	1.1	2.3	1.70				

The above differs from the preceding only that I have here returned back to the point of departure in an inverse order, instead of again beginning at 0° 0'.

In a similar manner the following five series were obtained.

Microscope A.			B.	Mean of A and B.	Mean of Pairs.	True angle.	Interpolated.	Error of division.
°	'	"	"	"	"	" "	"	"
30	0	0.0	59.8	59.90	0.17	19.65--0.43	0.43	-0.26
35	0	3.5	5.3	4.40	4.25	6	3.63	+0.62
40	0	6.6	8.7	7.65	7.65	"	6.84	+0.81
45	0	9.5	10.7	10.10	10.05	=3.705	10.04	+0.01
50	0	12.3	14.5	13.40	13.40		13.24	+0.16
55	0	14.7	16.9	15.80	15.30		16.45	-1.15

60	0	18.2	19.3	18.65	18.65		19.65	-1.00
55	0	13.2	16.4	14.80				
50	0	12.0	14.8	13.40				
45	0	9.6	10.4	10.00				
40	0	6.4	9.3	7.65				
35	0	2.5	5.7	4.10				
30	0	0.6	0.3	0.45				
<hr/>								
60	0	0.0	0.3	0.15	1.42		2.42	-1.00
65	0	1.5	2.6	2.05	3.60	15.65-2.42	4.63	-1.03
70	0	4.5	5.1	4.80	6.45	6	6.83	-0.38
75	0	7.9	7.2	7.55	8.70	"	9.04	-0.34
80	0	10.2	11.1	10.65	11.05	=2.205	11.24	-0.19
85	0	13.8	13.3	13.55	13.35		13.45	-0.10
90	0	15.1	15.3	15.20	15.20		15.65	-0.45
85	0	12.8	13.5	13.15				
80	0	10.7	12.2	11.45				
75	0	10.0	9.7	9.85				
70	0	7.3	8.9	8.10				
65	0	4.6	5.7	5.15				
60	0	2.7	2.7	2.70				
<hr/>								
90	0	0.0	0.9	0.45	59.90	" "	0.35	-0.45
95	0	59.4	58.0	58.70	58.02	60.35-52.67	59.07	-1.05
99	59	56.1	55.0	55.55	55.15	6	57.79	-2.64
101	59	54.8	53.2	54.15	54.77	"	56.51	-1.74
109	59	53.5	52.0	52.75	52.92	=1.28	55.23	-2.31
114	59	53.0	51.0	52.00	52.17		53.95	-1.78
119	59	52.0	50.2	51.10	51.10		52.67	-1.57
114	59	53.0	51.7	52.35				
109	59	53.2	53.0	53.10				
104	59	55.8	55.0	55.40				
99	59	54.2	55.3	54.75				
94	59	57.2	57.5	57.35				
89	59	59.0	59.7	59.35				
<hr/>								
120	0	0.0	57.0	58.50	59.85	" "	1.42	-1.57
125	0	1.5	59.5	0.50	2.52	10.65-1.42	2.96	-0.44
130	0	3.9	0.7	2.30	3.42	6	1.50	-1.08
135	0	5.0	3.0	4.00	5.50	"	6.04	-0.54
140	0	7.7	5.3	6.50	7.32	=1.538	7.57	-0.25
145	0	8.4	7.1	7.75	7.45		9.11	-1.66
150	0	8.9	8.1	8.50	8.50		10.65	-2.15
145	0	7.3	7.0					
140	0	9.9	6.4					
135	0	8.0	6.0					
130	0	5.7	3.4					
125	0	5.6	3.5					
120	0	2.1	0.3					
<hr/>								
150	0	0.0	59.0	59.50	0.00	" "	2.15	-2.15
154	59	58.8	57.5	58.15	56.57	62.15-38.98	58.29	-1.72
159	59	51.0	52.3	51.65	51.52	6	54.43	-2.91
164	59	48.0	48.5	48.25	49.55	"	50.56	-1.01
169	59	44.0	44.7	44.35	44.67	=3.862	46.70	-2.03
174	59	42.2	43.0	42.60	42.17		42.84	-0.67
179	59	38.2	39.7	38.95	38.95		38.98	-0.03
174	59	41.8	41.7	41.75				
169	59	44.2	45.8	45.00				
164	59	50.2	51.5	50.85				
159	59	50.8	52.0	51.40				
154	59	55.0	55.0	55.00				
150	0	1.3	59.7	0.50				

From the mean of 10 sets, similar to the above, the errors of division for two opposite divisions are as follows :

°	°	"	°	°	"
Error of 0 and 180		=0.00	Error at 95 and 275		=0.88
5	185	-0.64	100	280	-1.58
10	190	-0.46	105	285	-1.17
15	195	+0.13	110	290	-1.48
20	200	+0.45	115	295	-1.77
25	205	+0.61	120	300	-1.57
30	210	-0.26	125	305	-0.66
35	215	-0.56	130	310	-0.96
40	220	-0.29	135	315	-1.39
45	225	+0.05	140	320	-1.33
50	230	-0.12	145	325	-1.75
55	235	-0.80	150	330	-2.15
60	240	-1.00	155	335	-1.67
65	245	-1.20	160	340	-1.20
70	250	-1.30	165	345	-0.46
75	255	-0.69	170	350	-0.20
80	260	-0.23	175	355	+0.09
85	265	-0.12	180	360	-0.03
90	270	-0.45			

I am not prepared at present to furnish the error of the divisions intermediate between the above, but I may remark that out of a great many which *I have* examined, the largest error I have found does not exceed that above found for 150° and 330°.

VII.—*Table of the Times of high water at the principal places between Calcutta and Point Palmiras, prepared by Mr. P. G. SINCLAIR.*

We have much pleasure in giving insertion to the accompanying table, which will be extremely useful not only to navigators here, but also to the philosophers in Europe, who are now engaged in investigating the course of the tidal waves over the entire globe. We published in vol. ii. p. 151, a list of Professor WHEWELL's desiderata regarding the co-tides of the Indian ocean. His memoir on the cotidal lines is published in the Trans. Roy. Society 1833, Pt. 1, and we there find that the coasts of India present nearly a blank: the time of high water at Point Palmiras differs two hours from the time given by Mr. SINCLAIR's observations. We hope to be furnished from our correspondents at other places, such as Masulipatam, Madras, Chittagong, Kyook Phyoo, Penang and Singapur with tables similar to the present, but we would suggest, that the other desiderata, of the lift of the tide—the *establishment of the place*,—the correction for other days of the semi-lunar period, &c. should also receive the attention of observers.

The present table must not be understood as rigidly correct, but rather as an useful practical approximation; for the intervals of retar-

dations of the tide from day to day are made uniform, whereas a correction ought theoretically to be applied for the irregularity of the moon's daily motion: this correction calculated by Professor WHEWELL for the moon's mean parallax is as follows:

Time of  $\delta$ 's transit next before the tide, 0 1 2 3 4 5 6 7 8 9 10 11 12 hours.  
 Correction,..... 0 -16 -31 -41 -44 -51 0 +31 +44 +41 +31 +16 0 minutes.

In registering the time of high water for any place, so as to form the data of calculation, it should be always remembered that the interval between the moon's passage over the meridian, in apparent time, and the tide following it, is what is chiefly required, because it furnishes the direct means of verifying the above corrective equation.—Ed.

A Tide Table between Calcutta and False Point, prepared by Mr. P. G. Sinclair.

Moon's age.	Calcutta.	Mya-poor.	Fultah.	Diamond Harbour.	Culpee.	Mud-point.	Kedge-ree.	New Anchorage.	Saugor Point.	Spit Buoy.	Balasure River.	Centre of Balasure Roads 15 Fath.	Reef Buoy.	Mypur Isle or Pt. Pal-miras.	False Point.
Full & change	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.	h. m.
1	3..48	2..48	2..18	1..48	1..18	12..48	12..18	11..48	10..58	10..18	10..48	9..48	9..48	9..18	8..18
2	4..36	3..36	3..6	2..36	2..6	1..36	1..6	12..36	11..46	11..6	11..36	19..36	10..36	10..6	9..6
3	5..24	4..24	3..54	3..24	2..54	2..24	1..54	1..24	12..34	11..54	12..24	11..24	11..24	10..54	9..54
4	6..12	5..12	4..42	4..12	3..42	3..12	2..42	2..12	1..42	12..42	1..12	12..12	12..12	11..42	10..42
5	7..0	6..0	5..30	5..0	4..30	4..0	3..30	3..0	2..30	1..30	2..0	1..0	1..0	12..30	11..30
6	7..48	6..48	6..18	5..48	5..18	4..48	4..18	3..48	2..58	2..18	2..48	1..48	1..48	1..18	12..18
7	8..36	7..36	7..6	6..36	6..6	5..36	5..6	4..36	3..46	3..6	3..36	2..36	2..36	2..6	1..6
8	9..24	8..24	7..54	7..24	6..54	6..24	5..54	5..24	4..34	3..54	4..24	3..24	3..24	2..54	1..54
9	10..12	9..12	8..42	8..12	7..42	7..12	6..42	6..12	5..22	4..42	5..12	4..12	4..12	3..42	2..42
10	11..0	10..0	9..30	9..0	8..30	8..0	7..30	7..0	6..10	5..30	6..0	5..0	5..0	4..30	3..30
11	11..48	10..48	10..18	9..48	9..18	8..48	8..18	7..48	6..58	6..18	6..48	5..48	5..48	5..18	4..18
12	12..36	11..36	11..6	10..36	10..6	9..36	9..6	8..36	7..46	7..6	7..36	6..36	6..36	6..6	5..6
13	1..24	12..24	11..54	11..24	10..54	10..24	9..54	9..24	8..34	7..54	8..24	7..24	7..24	6..54	5..54
14	2..12	1..12	12..42	12..12	11..42	11..12	10..42	10..12	9..22	8..42	9..12	8..42	8..42	7..42	6..42

VIII.—*Proceedings of the Asiatic Society.*

*Wednesday Evening, the 3rd September, 1834.*

The Reverend W. H. MILL, D. D. Vice-President, in the Chair.

Read the Proceedings of last Meeting.

Read a letter from Mr. M. M. MANUK, intimating his desire to withdraw from the Society.

Read a letter from H. HARKNESS, Esq. Secretary to the Royal Asiatic Society of Great Britain and Ireland, expressing the thanks of that Society for the 17th volume of the Asiatic Researches.

The Secretary apprized the Society, of the arrival per Ship Edmonstone, of the twenty copies of the ancient Canarese Alphabet adverted to on the Meeting of 28th May, 1834, as presented by WALTER ELLIOT, Esq. through the Bombay Branch Asiatic Society.

It was resolved that copies of the Alphabet should be sent to the Bishop's College, the Education Committee, the Sanscrit College at Benares, and to such persons as may be engaged in decyphering ancient inscriptions.

*Library.*

Read a letter from Dr. N. WALLICH, presenting on the part of the Royal Society of Northern Antiquaries at Copenhagen, the following works with complimentary expressions :

A circular accompanied, explaining the objects of the association, and soliciting the co-operation of those, especially of the English nation, who may be able to assist in developing the early history of Northern Europe.

[A copy of the prospectus is printed on the cover of the present number.]

1. E. RASK's *Commentatio de pleno systemate decem sibilantium in linguis montanis, item de methodo Ibericam et Armenicam linguam litteris Europæis exprimendo.* Hafniæ, 1832, 4to.

2. Ditto, *Singalesisk Skriftherr*, (Cingalese Grammar,) Colombo, 1821, 8vo.

3. Ditto, *Veiledning*, or Introduction to the Akra language of the Coast of Guinea, with an Appendix on the Akvambu language.

4. Ditto, *Lapponic Grammar.* ✓

5. Ditto, *Italian Grammar* ? 1827.

6. Ditto, on *Ancient Egyptian Chronology.* Copenhagen, 1817, 4to.

7. Ditto, on *Ancient Hebrew Chronology*, 1828, 8vo.

8. *Old Northern Saga's* (Tales). Edited by the R. S. of North Antiquities, 11th vol. 1833.

9. *Færeyinga Saga*, or A History of the Inhabitants of the Islands called the Færoes. The original Icelandic text, with translations into Færoe, Danish, and German, 1829.

10. 11. *Tidsskrift*, Journal of the Northern Antiquities, by ditto.

12. *Nordisk Tidsskrift*, Northern Journal of Antiquities. Edited by the Royal Society of Northern Antiquities, 1826-9.

13. *Paradisa Missir*, (Paradise Lost,) translated into Icelandic, by Joe Thorlaksson.

14-15. *Scripta Historica Islandorum*, vols. iv. and v. Hafniæ, 1833.

16-17. *Lögþók Islandinga*, Codex Juris Islandorum Antiquissimus, I. and II. 1829.

18. *L. Giesebrecht.* The R. S. of N. Antiquities at Copenhagen.

Read a letter from M. RICHY, Judge of Chandernagore, presenting on the part of M. GARCIN DE TASSY, a copy of his

Notice sur les fêtes populaires des Hindous d'après les ouvrages Hindoustani. The following works were also presented :

Commentaire sur Le Yagna, L'un des Livres Religieux des Parsis, by Eugene Burnouf, vol. I.—*by the author.*

Origin of the Sikh Power in the Punjab, and Political Life of Muba Raja RUNJEET SINGH, &c. compiled by H. T. PRINSEP—*by the compiler.*

Journal Asiatique, Nos. 71, 72 and 74—*by the Asiatic Society of Paris.*

Transactions of the Society of Arts, &c. vol. xlix, I and II parts—*by the Society.*

Proceedings of the Geological Society, Nov. 6, 1833, Dec. 1\*.

Illustrations of the Botany, and Natural History of the Himálayan Mountains, &c. Part II.—*by F. J. Royle, Esq. F. L. S. and G. S. M., R. A. S.*

Meteorological Register for July, 1834—*by the Surveyor General.*

The India Journal of Medical Science for September—*by the Editors.*

The following Books were received from the Book-sellers.

Lardner's Cabinet Cyclopaedia, History of Natural Philosophy.

—————, Rome, 1st vol.

—————, Stebbing's History of the Church, 2nd vol.

*Antiquities.*

A native drawing of a compartment of one of the sculptured slabs of a building near Bhilsa, was presented by Dr. G. S. SPILSBURY.

This appears to be the very building whence Mr. HOBSON took the facsimile of his inscription, presented at a former meeting: the sculpture represents the erection or consecration of a Bauddha temple or *Chaitya*. It was visited in 1817 or 18 by Captain FELL, who described the inscriptions on the walls in one of the news-papers of the day.

Read a letter from Mr. TREGGAR of Jaunpur, descriptive of two gold coins of the Canouj group, recently discovered in digging on the site of an old fort called *Jaichand's koth* near Jaunpur.

[We shall have pleasure in inserting this paper when we have collected sufficient of the Canouj coins to make a plate. The inscriptions on the present coins are very distinct, in the character No. 2, Allahabad column, and the names are new.]

Further observations on the Hindu coins by Major STACY, were also submitted.

A note from Mr. SPIERS, of Allahabad, forwarded 4 coins dug up lately near that place.

They belong to what has been called the Behat group.

A paper by Col. BURNEY, Resident at Ava, was read, giving a translation and copious commentary in illustration of the Burmese inscription at *Buddha Gaya*: of which the original facsimile taken by his brother Captain GEORGE BURNEY, on the spot, accompanied.

This will be published at length; the principal discrepancy between Col. BURNEY'S translation and that made by RATNA PAULA is in the date, which the former carries back two hundred years, namely, to 468 Burman era, (A. D. 1106.) The first figure is rather indistinct in the inscription, and may be read either as

\* This day's proceedings contains a notice of Licut. BURNES' Memoir on the Geology of the banks of the Indus, the Indian Caucasus and the plains of Tartary.

a 4 or a 6. The facsimile must be lithographed to place the data before those who wish to decide the point. Col. BURNLEY'S interesting paper terminated with a highly curious extract-translation from the journal of the junior Burmese envoy, describing the visit of the mission to "Buddha's holy tree" at Gaya, and the ceremonies performed there in honor of the King of Ava.

*Physical.*

The Secretary exhibited to the members present the head of a mummy, and two mummied preparations of the *ibis* or sacred bird of Egypt, brought round by Lieutenant ARCHBOLD, being a part of his present alluded to at the last meeting.

The effect of damp air had already begun to be perceptible on the exposed parts of the head; nothing of the under jaw remaining but the bare bone, tinged of a dark brown colour from the bituminous matter of the wrapper. By keeping it in a glass case hermetically closed, and containing some lumps of muriate of lime, it is hoped that the specimens may be preserved for any length of time in the museum.

A letter was read from Lieut. W. FOLEY, dated Khyouk Phyoo, Ramree, 12th August, forwarding some specimens of fossil shells recently met with by himself in the interior of the island; also some coal from a new site.

The following extract explains the particulars of this new discovery:

"On my return to Arracan I made inquiries respecting the fossil marine shells that were at one time brought to me, and I have been so fortunate as to obtain them. They were found on a hill, in the neighbourhood of "*Chambo*" (a village in the interior of Rambree island), imbedded in a grey sandstone, which is very hard and gritty. The height of the hill may be as much as 100 feet above the plain. The weather has been so wet and boisterous that I have not been able to visit the spot, so that my information has been derived from the Mughs whom I had sent out to the place. They brought me in the shells, as also pieces of the sandstone. In the latter some remains of the shells are distinctly visible. The natives of Arracan attach much value to the shells on account of their supposed medicinal properties; the shells are pounded up, made into a kind of paste, and applied, as a salve, to sore eyes. Along with these shells I have also dispatched to you a specimen of coal discovered in Rambree island, near the village of "*Kyong-Towng*" in the "*Ladong*" circle; it was found resting on a bed of clay, near the surface, and did not appear to be very abundant. For the reason above mentioned I was not able to visit the spot, so sent a man out for the coal. Coal, I have no doubt, exists in abundance throughout Arracan; and of that hitherto discovered, I expect the *Syne-Kyoung* coal, if worked, would prove the best. I believe it contains no iron pyrites, as is the case with the "*Oogadong*" and "*Phooringooé*" coal. The coal I now sent is highly bituminous, and very much resembles the "*Kalabadong*" coal. I observe an error in the *sketch* of the site of the *Oogadong* coal published in your 2nd volume of the Journal As. Soc. plate 19, for November, 1833; instead of "*Syne-Kyoung*" creek, it should have been "*Oodagong*" creek. The former word should also have been *Syne-Kyoung*, not "*Syney-Kyoung*."

"I have also dispatched to you a specimen of cotton obtained from some Bourbon cotton seed sown by Captain WILLIAMS in the Government Garden at Rambree town in November, 1833, and gathered in March, 1834. The soil was a stiff clay and I believe, too cold and damp to favour the cultivation of the plant. It would however thrive well on the hills, where the soil is light."

Three of the shells are small univalves of 4 whorls, resembling the genus *turbo*: one is a species of *turritella*; the matrix is grey sandstone, containing the debris of trap rocks, and effervescing in acids slightly.

The coal is a lignite, leaving only 1-8 per cent. of ash on incineration.

Read the following extracts of a letter from the Reverend R. EVEREST regarding the fall of an aerolite at Hissar.

“ Having seen in the possession of Mrs. METCALFE of Delhi a fragment of meteoric stone, which she informed me had lately fallen near Hissar, I wrote to Capt. PARSONS, Supt. H. C. Stud there, for particulars, and have now the pleasure of sending his answer to you. The fragment I have seen bears the usual external characters of meteoric stone, has the same specific gravity, viz. 3.6, and affects the magnet. There can therefore be no doubt of the fact.

ROB. EVEREST.

*Extract of a letter from Captain Parsons, dated Hissar, 2nd August, 1834.*

“ I hasten to give you all the information I possess relative to the meteoric stone. It fell on the 8th of June, (as far as I could ascertain) at Charwallas, a village 23 coss west of this, about 8 o'clock in the morning the sky was cloudy and the weather gusty, or approaching to a north-wester, but no rain; very loud thunder, similar to constant discharges of *heavy* artillery, was heard for about half an hour before it fell, and in the direction *with* the wind to a great distance; when the stone fell it was accompanied by a trembling noise similar to a running fire of guns. It fell in the jungle close to a palee (or herdsman), who was out with his cattle. The original weight of the stone was 12 seers; but before my man reached the place, it had been broken and pieces taken away to Bikaner, Puttialah, &c. the piece I have is upwards of 4 seers, and if you would like to send it to Calcutta, you are most welcome to it, and I will send it to you, should you wish for it.”

Further specimens of the Jumna fossil bones belonging to Serjeant E. DEAN, were exhibited, and a paper on the subject by the same party was read.

[This will be given at length hereafter.]

### IX.—Miscellaneous.

*Mr. Trevelyan's Defence of Sir William Jones' System of Oriental Orthography.*

The Hurkaru newspaper of the 29th August, contains a reply to the article in our June number (p. 281), on the Adaptation of the Roman Alphabet to the Orthography of Oriental Languages, by the gentleman who has come forward with such vigour to revive the scientific system, as a necessary concomitant of his more extensive scheme of publishing Oriental books altogether in Roman characters. We have not space to insert the whole of his observations, but to such as bear upon the point at issue, we feel bound to give a place, being more satisfied, the more we reflect on the subject, that it is essential and imperative in the present widely diffused cultivation of the learned languages of India, to adhere to that notation which can alone command general acquiescence throughout Europe, and which is in fact the system followed in the great majority of the Dictionaries, Grammars, and transcribed works not only of our learned societies, but even of our colleges and schools.

The fundamental maxim of Sir WILLIAM JONES was, that each original sound and its appropriate symbol in the Déva Nágarí or Arabic should have its representative in the Roman, “ with due regard to the primitive power of the latter alphabet.”



Professor RASK also advocates the making of the Roman substitutes as nearly consonant as possible to the original;—"in his vero, me quidem iudice, hoc præceptum semper servandum, ut *quam proxime ad mentem ipsius nationis exprimantur ejus literæ.*" On this score the JONESIAN far surpasses the GILCHRISTIAN scheme of vowels, the long and short vowels of the same class being expressed by the same character:—but we must allow Mr. TREVELYAN to speak for himself.

"Sir WM. JONES' plan is systematic and complete in all its parts, so that in every case in which an analogy exists between different sounds, a corresponding analogy will be found to pervade the signs by which they are represented. Thus the long sound of *a* is *á*; of *i*, *í*; and of *u*, *ú*; and the diphthong *ai*, which is compounded of *a* and *i*, is represented by those letters, and *au* (*ow*) which is compounded of *a* and *u*, by *au*. The consequence of this strict attention to preserve an analogy in the sign corresponding to the variations in the sound is, that the acquisition of the Alphabet is greatly facilitated to the learner, who in fact has to make himself acquainted with only five elementary signs which are the representatives of as many original sounds, and the remaining five are only elongated form or composites of these.

"In Dr. GILCHRIST'S plan, with a single exception, there is no analogy whatever between the long and short forms of the vowels, and between the diphthongs and their component vowels. Thus in his system *a* is the long form of *u*, *ee* of *i*, and the diphthong *ai* is represented by *ue*, and *au* by *uo*. It is needless to dilate on the confusion which this want of system must produce in the mind of every learner. No help is here provided for him, and instead of being guided from step to step by a change in the form of the character, sufficient to distinguish the modification in the sound, while enough is retained of the original letter to mark the elementary connexion, he is perplexed by a variety of characters between which no kind of analogy is capable of being traced. In short, instead of having only five signs to get by heart, he has no less than nine. In tracing the analogy between corresponding modifications of sound, this plan is worse than if no assistance were afforded him. In this eccentric system of letters long vowels are actually divorced from their partners and so disguised as to render it impossible to recognize the original connection between them, and diphthongs are in like manner kidnapped from their parent vowels, and disfigured worse than Gypsy children. Who would suppose that *u* is the legitimate husband of *a*, that *ee* is the devoted wife of *i*, that *ue* is the interesting offspring of *a* and *i*, and *uo* the eldest hope of *a* and *u*. This is not a system of *orthography*, but if I may be allowed to invent a word, of *kakography*; of confusion, mystification and absurdity. It is singular that when a man sat down with a *carte blanche* before him to invent a system of letters, he was not able to devise something better than this; and it is still more so that having the labours of his learned predecessor Sir W. JONES to profit by, when he altered he should have altered so much for the worse.

"Another advantage of Sir WILLIAM JONES' plan is that, besides being complete in itself, owing to the perfect analogy which exists between the different letters, it bears a strict correspondence throughout to the great Indian or Deva Nágarí alphabet. All the alphabets derived from the latter are very systematic, and a scheme which is otherwise cannot properly represent them. But Sir W. JONES does it exactly, as will be seen from the following table:

अ	<i>a</i>	in	above	अ	<i>á</i>	in	art
इ	<i>i</i>		in	इ	<i>í</i>		police

उ	u	push	ऊ	ú	rule	.
ए	e	they	ऐ	ai	aisle	[pronunciation.
ओ	o	note	औ	au	causa, Italian or Latin	

“The natives of India are therefore already quite familiar with the idea of distinguishing the modification of sound by a corresponding modification of sign, and when they see the same plan adopted in the anglicized version of the alphabet, they immediately recognize the propriety of it, and enter into the spirit of the scheme. As the new orthography is mainly intended for the people of India, the circumstance of its being entirely coincident with their preconceived feelings and ideas must be allowed to be an advantage of no small importance.

“It is hardly necessary to observe, that no kind of analogy exists between Dr. GILCHRIST’S and the Indian Deva Nágari alphabet. When an Indian reads Sir WILLIAM JONES’ alphabet, he sees a long *á* immediately succeeding the short *a*; a long *í* the short *i*, and a long *ú* the short *u*. (the long vowel being in each case distinguished by a mark as in the Sanscrit) which is just what his previous knowledge would lead him to expect; but when he comes to Dr. GILCHRIST’S plan, he finds *u* following *u*, and *ee* following *i*. What therefore would be his opinion of the comparative merits of the two systems? Would he not say, that one is in every respect as complete as the alphabet of the gods (Deva Nágari), while the other is an inexplicable mass of confusion.

“Another advantage attending Sir WILLIAM JONES’ system is, that it is not only analogous to, but is the very system itself which is used in expressing Latin and all its derivations; that is Italian, Spanish, French, &c. It is true that in England we do not pronounce Latin in this way, but this is only because we have barbarized it, and made it accord with our Saxon pronunciation. Even in Scotland and Ireland, to say nothing of Continental Europe, they read Latin exactly in the way in which it is now proposed to read Hindusthání. This entire coincidence of the new Hindusthání orthography with the orthography of the learned language of the whole of Europe, and with that of most of its colloquial languages, is a point of great importance. Even in the present age its advantage will be felt, in so far as the learned all over Europe, and in most cases the vulgar also, will by this means obtain direct access to our Indian Literature; and what is still more deserving of consideration, a foundation will be laid for the establishment in due time of an uniform system of orthography throughout the world. This is an object, which, however distant the prospect of accomplishing it may be, no man who has the slightest regard for posterity, should ever lose sight of:—next to the establishment of an universal language, that grand desideratum of the philosopher and the philanthropist, the establishment of an universal system of orthography will most tend to the production of unrestricted freedom of intercourse between all the families of the human race; and the one has also a direct tendency to bring about the other. Now if GILCHRIST’S plan were to be generally maintained in India, so far from having advanced a step towards this grand result, we should make a decidedly retrograde movement, and the proceeding would be tantamount to shutting the door to the possibility of an uniform system of writing and printing being ever adopted in the eastern and western hemispheres. GILCHRIST’S plan is utterly abhorrent from the Roman family of languages, and it does not even coincide with the English, as will be shown hereafter.

“Sir WILLIAM JONES’ plan has a simple character for every simple sound, while in Dr. GILCHRIST’S simple sounds are in three instances expressed by double letters

[ee, oo and oo]. This, to say the best of it, is an extremely clumsy contrivance, and in the business of nations and course of ages it would lead to an immense unnecessary expenditure of time and money. That this is the case, may be seen by taking the example of a single sentence,

Bees tees moorghabec huen toomharee peechee,

which in Sir WILLIAM JONES' orthography would be,

Bís tís murghábi hain tumhári píchí.

“There are 37 letters in this sentence written according to Dr. GILCHRIST's plan, and only 30 if it be written according to JONES; that is to say, in only 6 words the former exceeds the latter by no less than 7 letters. Apply this to a book, and conceive the waste of types, paper, and valuable time which must result from it. Supposing an octavo volume, printed according to Sir WILLIAM JONES' plan, to consist of 500 pages, and each page to contain on an average 304 words, the total number of words in the volume would be 1,52,000; and if the same volume were printed according to Dr. GILCHRIST's plan, then at the rate of 7 additional letters for every 6 words, the number of extra letters will amount to 1,77,000, which would make an addition to the book of 116 pages, and instead of consisting of 500 pages it would consist of 619. Apply this to the entire literature of half the world through a succession of ages, and conceive the result, if you can. If this average is considered to be above the mark, I have no objection to suppose that every six of GILCHRIST's words contain only half the number of double letters which those above instanced do, and at this rate the book printed according to GILCHRIST's plan would exceed what it would be if printed according to Sir WILLIAM JONES' plan by 58 pages.

“Lastly, there are three characters in GILCHRIST's alphabet which do not belong to English or to any other language under the sun which we have ever heard of. These are *oo*, *ue* and *uo*. With the exception of the pupils of Dr. GILCHRIST who, from early associations and respect to their master, may naturally be expected to be admirers of his scheme, these three characters are utterly barbarous to every description of people; and it is therefore impossible for them to secure a general recognition for themselves in the breasts either of Englishmen, European foreigners or Indians. Sir WILLIAM JONES' plan, as has been before stated, contains no arbitrary sounds whatever; but is in every respect in strict accordance with the Latin and Latino-European languages. Even the *au*, of which no example is to be found in English, is perfectly familiar to every Scotchman and Irishman who knows Latin; and if a youth at Dublin College, or the High School at Edinburgh, were to pronounce *causa* like *cawsa*, he would be immediately corrected and told to sound it *cowsa*, and the same of course every where on the continent of Europe.

“It should be borne in mind that Sir WILLIAM JONES and Mr. GILCHRIST both drew from the mine of English letters, and that the only difference between them is that one appropriated the dross, while the other culled the pure gold. GILCHRIST chose the most corrupt and imperfect parts of our system, while JONES selected those which were consistent with true principles and coincided with the most perfect alphabets both of the East and West. The *i* in *police* is almost as well known in English as the double *ee* in *feel*. The *u* in *pull* is certainly better known than *oo*, which is pure GILCHRISTIAN. The *ú* in *rule* is as familiar as the double *oo* in *cool*. The *ai* in *aisle* is assuredly far more common than *ue*, which is another arbitrary sign to be found no where except in the books printed by Dr. GILCHRIST himself. The *au* in *causa* (Latin pronunciation) is also better under-

stood than *uo*, which is another Gilchristian hieroglyphic ; and even the short *a*, the stumbling-block of our GILCHRISTIAN friends, is quite as familiar to us as their favourite *u*, and any body who will take the trouble to look in the English Dictionary, will see it used at the commencement of 500 words like *above*, *about*, *abound*, and so forth."

We have not space to continue our extract, nor does the remainder of the author's reasoning bear upon the precise question at issue. He however mentions one strong fact in support of his object ; namely, that the Italian orthography has been adopted by the American missionaries for the language of the Sandwich Islands. To this we may add, that the same as far as regards the vowels is uniformly upheld by Professor RASK of Copenhagen, the celebrated philologist, who has devoted years of study to the fixing of accurate Roman equivalents for the Zend, Arabic, Sanscrit, Armenian, and other alphabets. We recommend his essay "de Pleno Systemate Decem Sibilantium in Linguis Montanis, &c." to the serious attention of all those engaged in similar objects ; the following caution applies to the case of the Bengálí and other dialects derived from the Sanscrit stock, in which it has been opposed to the uniform system, that the inherent short vowel having the sound of *o* could not be represented by *a*.

"Altera cautela haud parvi momenti est, ubi lingua quædam antiqua quodammodo adhuc vivit, nimirum ne pronunciatione hodierna, si a litera discedat, pro genuina assumpta, scripturam antiquæ linguæ ad eam exprimendam depravemus, vocumque etymologias turbemus."

The above remark of course equally opposes any reform of the *spelling* of an established language like the English or the French to suit the modern pronunciation. His concluding paragraph will afford encouragement to those who calculate upon the eventual substitution of the Roman characters for those of India, although he is far from anticipating any such effect even for the limited country, Armenia, (Christian though it be) to whose language his essay refers.

"His observatis, haud ita difficile est scripturam Europæam cuivis linguæ peregrinæ accommodare, atque ita quidem ut ipsa gens, si per commercium Europæorum tale systema existere resciverit, immensum ambitum literaturæ gentium Europæorum intellexerit, fructum, oblectationem, gloriam, inde redundantes consideraverit, haud reluctantè id suum facerè velit, saltem viri docti non solum voces singulas accuratè et sine ulla confusione citare, sed quodlibet scriptum gentis ita trans-scribere et facili negotio typis exprimere ; immo trans-scribendo commoda quædam pensa in studio suo haud parum levare poterunt." *Commentatio &c. Aut. E. Rask, Hafniæ, 1832.*

*Royal Asiatic Society of Great Britain and Ireland.*

We observe that this Society has come to the determination of publishing its future Transactions in the form of a *Journal* in octavo, to appear once in three months, price 6s. We cannot but feel that this resolution strengthens greatly the arguments in favor of the plan adopted and pursued now for nearly six years by Captain HERBERT and ourselves, for whatever can be urged in support of a quarterly journal—the early appearance of papers, the cheap and convenient form for circulation, &c. will apply more forcibly to a monthly periodical. This is the only form in which the lucubrations of the French Asiatic Society—a Society yielding to none in the erudition and activity of its members—have hitherto appeared.

The cover of the present number contains the prospectus of the new journal.

X.—*Catalogue of Birds of the Raptorial and Insectorial Orders, (systematically arranged,) observed in the Dakhan, by Lieut.-Colonel W. H. SYKES, Bombay Army, F.L.S., F.G.S., F.Z.S. M.R.A.S.*

In the first volume of the Journal, page 161, we presented Col. SYKES'S catalogue of the Mammalia of South India. This officer's fame as a naturalist has, we are happy to see, raised him to a Vice President's chair in the Zoological Society of London. In the proceedings of this active institution for April, 1832, (the arrival of which in India was by some accident delayed,) we perceive the following useful catalogue of the birds of the same country, which we hasten to transfer to our Journal. The list is prefaced by the following remarks :

Lieut.-Colonel SYKES, having brought before the Committee at previous meetings various *Birds of the Raptorial and Insectorial Orders*, collected by him during his residence in Dakhan, completed on the present evening the exhibition of his collection of those orders. He limited his observations on the several species to brief extracts from the copious notes which he had made in India respecting their habits, internal anatomy, and geographical distribution. In bringing them in succession under the notice of the Committee, he observed the order adopted in the following catalogue :

ORDER 1. RAPTORES, III.

Fam. *Vulturidæ*, Vigors.—Genus *Vultur*, Auct. *Vulture*.

1. *Vult. Indicus*, Lath. *Vautour Indou*, Temm., Pl. Col. 26. *Mahah Dhoh* of the Mahrattas.

*Irides* deep brown. Length 42 inches, inclusive of tail of 10½ inches. A stone half an inch in diameter was found in the stomach of one bird. The proportional length of the intestine to the body in these birds is 3 to 1, while in the *Neophron Percnopterus* it is 5.20 to 1. They congregate in flocks of twenty or thirty. On a dead camel, or horse, or bullock being thrown out on the plain, numbers of these *Vultures* are found assembled round it in an incredibly short time, although they may not have been seen in the neighbourhood for weeks before. Col. SYKES'S specimens are no doubt referrible to M. TEMMINCK'S species, although the latter bird is described as having whitish *irides*.

2. *Vult. Ponticerianus*, Lath. *Vautour Royal de Pondicherry*, Sonn., p. 182. pl. 104.

The *irides* are described by SHAW as red, while in two of Colonel SYKES'S specimens they were of a deep brown, and in the third of a bright straw-yellow; but as the last had allowed itself to be captured by hand, had only grass and stalks of herbaceous plants in the stomach, and was evidently ill, the pale colour of the *irides* may be attributed to disease. Sexes alike in plumage. Mostly solitary. Colonel SYKES seldom, if ever, saw more than two together. The remarkable flatness of the crown, and very great width of the *cranium*, would seem to indicate a generic difference between this species and the *Vult. fulvus* and *Bengalensis*. Length of bird 36 inches, inclusive of tail of 11 inches.

3. *Vult. Bengalensis*, Gmel. *Bengal Vulture*, Lath. *Gæil* of the Mahrattas.

Of a smaller size, and with shorter and stouter legs than *Vult. Indicus*. Habits similar. Sexes alike. Length 30 inches, inclusive of tail of 10 inches. Colonel SYKES was induced to consider this species of Gmelin as distinct from *Vult. cinereus*, with which it has been classed by M. TIMMINCK, in his *Manuel d'Ornithologie*, p. 4.

Genus *Neophron*, Sav.

4. *Neophron Percnopterus*. *Vultur Percnopterus*, Linn. *Rachamah*, Bruce, Trav. Append. p. 163.

*Irides* intense red brown. Gregarious. Sexes alike in adult birds; but non-adult birds vary in plumage from fuscous to mottled brown and white. These birds are always found in cantonments and camps. For the most part of the day they continue on the wing, soaring in circles. When on the ground, they walk with a peculiar gait, lifting their legs very high. They are efficient scavengers. Length 29 inches, inclusive of tail of 11 inches.

Fam. *Falconidæ*, Leach.

Sub-Fam. *Aquilina*. *Eagles*.

Genus *Haliaëtus*, Sav. *Sea Eagle*.

5. *Hal. Ponticerianus*. *Falco Ponticerianus*, Lath. *Aigle de Pondicherry*, Buffon, p. 136, Pl. Enl. 416. Called *Brahmany Kite* by Europeans in India.

*Irides* reddish brown. It is seen constantly passing up and down rivers at a considerable height, but prepared to fall at an instant on its prey. Usually it seizes while on the wing, but occasionally dips entirely under water, appearing to rise again with difficulty. It is quite a mistake to suppose it feeds on carrion. Colonel SYKES has examined the contents of the stomach and craw of many specimens and always found fish, and fish only, excepting on one occasion, when a crab was

met with. Sexes alike. Female lays two large white eggs. Length, inclusive of tail, 19 to 21 inches : tail 9 inches.

Genus *Circaetus*, Vieill.

6. *Circ. brachydactylus*. *Falco brachydactylus*, Wolf. *Aquila brachydactyla*, Meyer. *Falco Gallicus*, Gmel., p. 295. sp. 52. *Le Jean le Blanc*, Pl. Enl. 413.

Colonel SYKE'S specimen was a female. Irides deep orange at the external margin, passing to straw-yellow at the internal margin. The remains of a snake and two rats were found in the stomach. Length, inclusive of tail, 30 inches : tail 11 inches.

Genus *Aquila*, Auct.

7. *Aq. chrysaëta*. *Falco chrysaëtos*, Linn. *Golden Eagle*, Lath.

Colonel SYKE'S specimen differs so slightly from the European bird as not to justify its separation.

8. *Aq. bifasciata*, Hardwicke and Gray's Ind. Zool.

Irides brownish yellow ochre. Sexes alike in plumage ; non-adult birds paler than adults. A whole rat found in the stomach of one bird. A second bird was shot by Colonel SYKE'S at the dead carcass of a royal tiger ; but it had not tasted the banquet, as the stomach was empty. Length, inclusive of tail, 30 inches : tail 11 inches.

Genus *Hæmatornis*, Vigors.

9. *Hæm. Bacha*. *Falco Bacha*, Daud. pl. 22. *Le Bacha*, Le Vaill., Ois. d'Afr. pl. 15.

Colonel SYKE'S collection does not possess a specimen, but he identified a specimen in the possession of a friend, shot in the Dakhan.

Sub-Fam. *Accipitrina*. Hawk.

Genus *Accipiter*, Ray. Sparrow Hawk.

10. ACCIPITER DUKHUNENSIS. *Acc. supra fusco-brunneus, plumarum marginibus pallidioribus, capite postico nuchaque albo variegatis ; subtus albus, pectore abdomineque notis subrotundatis grandibus, femorum tectricibus parvis, rufescentibus striatis ; rectricibus fusco fasciatis, fasciis externarum confertioribus ; tarsis subbrevis.*

Irides stramineo-flavæ, margine gracili nigro circumdatæ.

Longitudo corporis  $14\frac{1}{2}$  unc., caudæ  $6\frac{1}{2}$ , tarsi  $1\frac{1}{8}$ .

Sexes alike in plumage. Resembles the *Acc. fringillarius*, but differs in the longitudinal broad reddish patches on the breast, in less red on the sides, in a black narrow streak down the throat, in shorter wings, in the tail having six broad bars instead of four, in the male bird being as large as the European female, and finally in the shorter tarsi and centre toes.

11. *Acc. Dussumieri*. *Falco Dussumieri*, Temm., Pl. Col. 308. female.

Irides bright yellow, with an exterior narrow margin of black. Wings short. Tail long and narrow, being only the width of the upper feather. M. TEMMINCK'S specific characters are taken from a female, the male being unknown. Colonel SYKE'S has but one specimen, and that a female, the male being unknown to him. Length, inclusive of tail,  $12\frac{1}{2}$  inches : tail  $6\frac{1}{2}$  inches.

Genus *Astur*. Auct. Goshawk.

12. ASTUR HYDER. *Ast. corpore supra et subtus brunneo, dorso imo rufescenti, plumarum rhuchibus fuscis, alarum tectricibus albo notatis ; abdomine maculis albis fasciato : frontis fasciâ gracili guttureque albis, hoc lineis tribus latis fuscis, una in medio, cæteris utrinque ad latera, notato ; femorum tectricibus crissoque albis, rufo fasciatis ; caudâ supra rufâ, fasciis quinque gracilibus, ferè obsoletis, alterâque prope basin latâ, fuscis notatâ ; remigibus fusco-brunneis ad apicem fuscis, pogoniis internis fasciis quinque fuscis gracilibus, alboque ad basin notatis.*

Rostrum ad basin flavum, ad apicem nigrum. Pedes flavi ; unguibus nigris. Longitudo corporis  $16\frac{1}{2}$ — $17$  unc., caudæ  $6\frac{1}{2}$ — $7$ .

This bird has the three stripes upon the throat, and the aspect of *Falco trivirgatus*, Temm., fig. 303, but it is a much larger bird than M. TEMMINCK'S, and has otherwise characters in the plumage to entitle it to a specific distinction. A couple of mice were found in the stomach of one bird. Sexes alike in plumage. Female a little larger than the male.

Sub-Fam. *Falconina*.

Genus *Falco*, Auct. Falcon.

13. *Falco Tinnunculus*, Linn. Kestrel.

Irides intense brown. A very abundant bird in the Dakhan. Both sexes are absolutely identical with the European birds in their characteristic plumage.

Colonel SYKES, nevertheless, mentions his being in possession of a male bird exactly like the female of the *Kestrel* in plumage and size, and, consequently, larger than the male *Kestrel*: and, as this was shot from a party of five or six, perched on the same tree, and without a male *Kestrel* in company, he is induced to believe there is a distinct species, in which both sexes have the plumage of the female European *Kestrel*. Remains of rats, mice, lizards, grasshoppers, and a bird, were found in the stomach of several specimens. In one stomach the remains of no less than four lizards were met with.

14. *Falco Chicquera*. Lath. *Le Chicquera*, *Le Vaill.*, Ois. d'Afr. pl. 22.

*Irides sanguineous*. A common bird in the Dakhan. Sexes alike in plumage. Female usually the larger bird; but Colonel SYKES has a male quite as large as any female. A sparrow was found in the stomach of one male bird, and a young bat in the stomach of another.

Sub-Fam. *Buteonina*. Buzzards.

Genus *Circus*, Auct. Harrier.

15. *CIRCUS PALLIDUS*. *Circ. pallidè griseus, alis dorsoque saturatioribus; subtus albus, uropygio albo, griseo fasciatim notato; rectricibus, duabus mediis exceptis, griseo alboque fasciatis; remigibus tertiam quartam quintaque fuscis.*

*Irides viridi-flavæ. ♂. Longitudo corporis 19½ unc., caudæ 9½; ♀ corporis 21½; caudæ 10.*

This bird has usually been considered the *Circ. cyaneus* of Europe; but it differs in the shade of its plumage (male and female); in the back-head of the male not being white spotted with pale brown; in the absence of dusky streaks on the breast; in the rump and upper tail-coverts being white barred with brown ash; in the inner webs of four of the tail-feathers not being white; and in the bars of the under tail being seven instead of four. The female resembles the female of *Circ. cyaneus*, but the plumage is two shades lighter, the tail is barred with six broad fuscous bars, instead of four, and the tail-feathers are much more pointed. The remains of six lizards were found in the stomach of one bird. Colonel SYKES never saw these birds perch on trees. They frequent the open stony plains only. The sexes were never seen together.

16. *CIRCUS VARIEGATUS*. *Circ. capite supra, nucha, ptilis, pectoreque rufis, plumis in medio latè brunneis; dorso scapularibus, remigibusque externis intense brunneis; pteromatibus, remigibus internis, caudaque griseis; abdomine femorumque tectricibus rufis; caudæ tectricibus superioribus rufo albo brunneoque, inferioribus grisee saturatioribus, notatis. Longitudo corporis 21 unc., caudæ 10.*

This is a very remarkable bird, and in its plumage seems to possess much of the united characters of the sexes of this genus, which are known generally to exhibit a marked difference. Colonel SYKES possesses but one specimen, a male.

Sub-Fam. *Milvina*.

Genus *Milvus*, Auct. Kite.

17. *MILVUS GOVINDA*. *Milv. capite, nucha, corporeque subtus rufescenti-brunneis, plumis in medio fusco lineatis; dorso, alis, caudaque satis furcatè saturatè brunneis, illarum pteromatibus pallidioribus, hinc fusco obsolete fasciato.*

*Longitudo corporis 26 unc., caudæ 11.*

This bird differs from the *Falco Cheele* in the want of white spots on the wing-coverts, white before the eyes, and white bar on the tail; in having the inner webs of the tail-feathers barred with numerous narrow bars, and in the shafts of the feathers about the head and neck, and generally underneath, being very dark. Sexes alike. Constantly soaring in the air in circles; watching an opportunity to dart upon a chicken, upon refuse animal matter thrown from the cook-room, and occasionally even having the hardihood to stoop at a dish of meat carrying from the cook-room to the house.

Fam. *Strigidae*, Leach.—Genus *Otus*, Cuv.

18. *Ot. Bengalensis*, Franklin, Proceed. Zool. Soc. I. p. 115, *Goobur* of the Mahrattas.

*Irides*, external margin dark orange, gradually changing to yellow at the internal margin. Very common in the Dakhan. Generally found on the open rocky plains. A whole rat, (the tail hanging out of the mouth, and the head and most part of the body in the stomach, and partly decomposed,) was found in one bird; another had a crab, a third a *pastor*; but the usual food appeared to be rats.

Genus *Strix*, Auct.

19. *Strix Javanica*, Horsf.

Although at a superficial view this species appears to be the *barn-door Owl* of Europe (*Strix flammea*), a comparison of several specimens with the European bird satisfies Colonel SYKES that Dr. HORSFIELD was right in separating it. Neither sex is unspotted white underneath, nor has the Indian species a white disc. Sexes

alike, with the exception of the plumage of the female being a shade or two lighter than that of the male. Length, inclusive of tail, 17 inches: tail 5 inches. One of Colonel SYKES'S specimens was captured alive while lying on its back on the ground, defending itself against the attacks of a body of crows. Irides reddish dark brown.

20. *STRIX INDRANEE*. *Strix capite supra pallidè brunneo, plumis albido marginatis, dorso imo, pteromatibusque rufescenti-brunneis, fasciis albis fusco marginatis notatis; dorso medio, ptilis, remigibus caudaque brunneis, his rufescenti fasciatis, nœ facibus albidis gracilibus notatâ, ad apicem albo marginalâ; gula crissoque albescentibus; abdomine subrufo, brunneo graciliter fasciato; regione circumoculari nigra; disco rufo, brunneo marginato.*

Irides rufo-brunneæ. Longitudo corporis 21 unc., caudæ 9.

Inhabits the woods of the Ghauts. rare. The specimen described is a young bird, and a female.

Genus *Ketupa*, Less.

21. *Ketupa Leschenaulti*, Less., *Traité d'Ornith.* p. 114. *Strix Leschenaulti*, Temm. Pl. Col. 20. *Scops? Leschenaulti*, Steph., vol. 13. p. 53.

A rare bird in the Dakhan. Independently of the naked legs of this bird, its aquiline aspect authorizes its separation from the genera with which it had been placed previously to M. LESSON'S arrangement.

Genus *Noctua*, Sav.

22. *Noct. Indica*, Frankl. *Peenglah* of the Mahrattas.

Irides, King's yellow. Sexes alike. Mice and beetles found in the stomach. An exceedingly noisy bird, and frequently heard chattering during the day-time in dense trees. The Mahrattas have a superstition respecting this species; and a class of persons, called from it *Peenglah*, live on the credulity of the people by pretending to consult it, and predict events. Length, inclusive of tail, 9½ to 11 inches: tail 2½ to 3 inches. Numerous in the Dakhan, and found in families of four or five.

ORDER II. INSESSORES, Vigors.

Tribus FISSIROSTRES, Cur.

Fam. *Meropidæ*.—Genus *Merops*, Linn.

23. *Merops viridis*, Linn. *Indian Bee-eater*, Lath. *Guêpier à collier de Madagascar*, Buff.

Fam. *Hirundinidæ*, Leach.—Genus *Hirundo*, Auct.

24. *Hirundo filifera*, Steph., vol. 13. p. 79. *Hir. filicaudata*, Frankl.

Very abundant in Dakhan, and very beautiful, with its thread-like tail-feathers floating behind when in flight.

25. *HIRUNDO JEWAN*. Mas. *Hir. capite, dorso, tectricibus alarum, uropygio, reatricibus mediis fuscâque latâ pectoruli metallicè nigris; corpore subtilis rosaceo-albo, gutture rufo; remigibus reatricibusque lateralibus fusco-nigris, his internè albo maculatis.*

Fem. et jun. *Gutturè magis rufo notato.*

Irides intensè rufescenti-brunneæ. Longitudo corporis 6 unc., caudæ 3½.

This bird differs from the common English *Swallow*, (*Hir. rustica*), only in its somewhat smaller size, larger bill, and in the lateral tail-feathers not being equally elongated. The tail is less forked, and the rufous colour of the throat extends more on the breast.

26. *HIRUNDO CONCOLOR*. *Hir. fuliginoso-brunnea, sericea; caudâ æquali, reatricibus, externis mediisque exceptis, internè albo guttatis.*

Longitudo corporis 5 unc., caudæ 2½.

These birds live on the banks of rivers. The plumage of the sexes does not differ.

27. *HIRUNDO ERYTHROPYGIA*. *Hir. metallicè nigra; uropygio collarique nuchali rufis; corpore subtilis albo, pallidè rosaceo tincto, plumis in medio graciliter brunneo striatis.*

Longitudo corporis 6 unc., caudæ 3.

This species appeared in millions in two successive years in the month of March on the parade-ground at Poona: they rested a day or two only, and were never seen in the same numbers afterwards.

Genus *Cypselus*, Ill.

28. *Cypselus affinis*, Hardw. *Allied Swift*, Hardw.

These birds are so rare in Dakhan that Colonel SYKES obtained only two specimens.

Fam. *Caprimulgidæ*, Vigors.—Genus *Caprimulgus*, Auct.

29. *Caprimulgus monticolus*, Frankl. *Great Bombay Goat-sucker*, Lath.

30. *Caprimulgus Asiaticus*, Lath. *Bombay Goat-sucker*, Id.



31. *CAPRIMULGUS MAHRATTENSIS*. *Capr. pallidus cinereo-griseus, brunneo ferrugineoque maculatus variegatissime: thorace, remigibus tribus externis in medio, rectricibusque duabus lateralibus ad apices, albo notatis.*

Longitudo corporis 8.8 unc., cauda 5.5

This species differs from the two preceding in the prevalent grayness of the plumage, and in the absence of the subroseous collar on the nape of the neck.

Fam. Halcyonide, Vigors — Genus Halcyon, Swains Crab-eater.

32. *Halcyon Smyrnenis*. *Alcedo Smyrnenis*, Linn *Smyrna Kingsfisher*.

In the description of this bird authors appear to have omitted to mention the chestnut small wing-coverts, and fine rich chocolate black medial-wing coverts. This species frequents well irrigated gardens and old wells, rather than brooks or rivers. Grasshoppers were frequently found in the stomach.

Genus *Alcedo*, Auct. Kingsfisher.

33. *Alcedo rudis*, Linn. *Black and White Kingsfisher*, Edw., pl. 9.

In all Colonel SYKES'S specimens the male bird is distinguished from the female by a single or broken double black bar across the breast

34. *Alcedo Bengulensis*, Gmel *Little Indian Kingsfisher*, Edw., pl. 11.

This species affects brooks it is never seen in gardens.

Genus *Ceryx*, La Cép.

35. *Ceryx tridactyla*, La Cép. Buff., Pl. Enl. 778, fig 2

This very beautiful bird differs from BUFFON'S drawing only in a purple spot terminating the ridge of the bill, and in a reddish spot on each side of it.

Tribus DENTIROSTRES, Cuv.

Fam. *Muscicapidae*, Vigors. — Genus *Muscipeta*, Cuv.

36. *Musc. Paradisi*, Cuv. *Mas. Musc. alba, capite cristato colloque violaceo-atris, pteromatibus remigibusque atris albo marginatis, rhachibus rectricum atris.*

Fam. *Dorso, alis, caudaque castaneis, corpore subtus albo, gutture, collo, pectore, nuchoque griseis, hac saturatiore, capite cristato violaceo-atro, remigibus fuscis.*

Longitudo corporis 10½ unc., cauda 6,

*Muscicapa Paradisi*, Linn *Paradise Fly-catcher*, Lath. *Avis Paradisiaca orientalis*, Seba, 1. t. 52. f. 3. *Pied Bird of Paradise*, Edw., pl. 113.

37. *Muscipeta Indica*, Steph vol. XIII p 3 *Mas Musc. corpore supra castaneo, subtus albo, pectore grisescenti, capite cristato colloque violaceo-atris.*

Fam. *masi similis, rectricibus duabus medius paulum elongatis.*

Statura precedentis. *Irides intensè rufo-brunnæ*

*Avis Paradisiaca cristata*, Seba, 1 t. 30. f 5. *Upupa Paradisea*, Linn. *Promerops Indicus cristatus*, Brisson. *Crested long-tailed Pie*, Edw., pl. 325

These two birds have lately been erroneously considered to belong to one species.

They were never found however by Colonel SYKES (who shot many,) in the same locality, nor did he observe any intermediate stage of plumage. The difference between the females of the two birds noticed above at once decides the distinction of species. The two central tail-feathers of the males (not of the females) are elongated to three or four times the length of the body, in one specimen they are 15¼ inches long. They feed principally on the ground, and on very minute insects.

There has been much confusion among the early descriptions of these birds. LINNÆUS describes the *Musc. Indica* as an *Upupa*, BRISSON as a *Promerops*, and others as a *Pica*, *Icterus*, *Todus*, *Manucodiata*, &c. The specific name of *Indica* seems to have the right of priority over that of *castanea* given by M. TAMMINCK, (See M. KÜHL'S 'Systematic Catalogue of the Fl. Étalumiées, page 5,) as having originally been assigned to the bird by BRISSON. Other well marked species, nearly allied to the two preceding, the males of which have similarly elongated tail-feathers, are found in Africa and China.

38. *Muscipeta flammea*, Cuv. *Gobe-mouche flammee*, Temm., Pl. Col., 263. Male and Female.

The cry of this bird is *wheet, wheet, wheet*. In the colours, the female has yellow where the male has scarlet. *Irides brown-black.*

39. *Muscipeta peregrina*. *Parus peregrinus*, Linn. *Crimson-rumped Fly-catcher*, Lath.

Genus *Muscicapa*, Auct.

40. *Muscicapa melanops*, Vigors. Figured in GOULD'S 'Century of Himalayan Birds.'

41. *Muscicapa Bangata*, Harol. *Banyans Fly-catcher*, Lath. *Gobe-mouche chanteur*, Temm.

42. *MUSCICAPA POONENSIS*. *Musc. supra cinereo-brunnea; subtus sordidè alba, mandibulis superiori nigra, inferiori ad basim alba.*  
Longitudo corporis 4.5 unc., cauda 1.8.

These birds sit on the extreme twigs of trees, and dart on passing insects in the manner of the *Myops vrbilis*.

43. *MUSCICAPA CERULEOCEPHALA*. *Musc. cinereo-brunnea, caeruleo leviter tineta; capite thoraceque laevibus; pectore sublaevibus; abdomine crissaque albis.*  
Longitudo corporis 5 $\frac{1}{2}$  unc., cauda 2 $\frac{1}{2}$ .

44. *MUSCICAPA PIGATA*. *Musc. supra atra, subtus sordidi alba; strigâ a mento ad nuham utrinque extendente, fasciâ alarum, uropygio, crisso, apicibusque rectricum duarum lateralium albis.*

Longitudo corporis 5 $\frac{1}{2}$  unc., cauda 2 $\frac{1}{2}$ .

Genus *Rhipidura*, Vigors and Horsf. Fun-tailed Fly-catcher.

45. *Rhipidura albofrontata*, Frankl.

46. *Rhipidura fuscipennis*, Frankl.

Colonel SYKES has shot both these birds in the same localities. The male has a very sweet note. He spreads and raises his tail over his head in hopping from bough to bough. Both species have the aspect and habits of the Australian bird *Muscicapa flabellifera*, Gmel. Irides deep sepia brown.

Fam. *Laniidae*, Vigors.

Genus *Dicrurus*, Vieill.—*Edolus*, Temm.

47. *Dicrurus Balicassius*. *Corvus Balicassius*, Linn.

48. *Dicrurus carulescens*, Linn. *Lanius Fungah*, Shaw, t. 7. p. 291.

Genus *Hypsipetes*, Vigors.

49. *HYSPIPETES GANESSA*. *Hyps. griseo-brunnea, subtus pallidior; alis remigibusque brunneis; capite supra vix cristato metallicè atro.*

Longitudo corporis 10 unc., cauda 4. Irides intense rufo-brunneæ.

Tongue bifid, and deeply fringed; sexes exactly alike. Stony fruit found in the stomach. Neck short, and head sunk into the shoulders; flight very rapid. Found only in the dense woods of the Ghauts. The tongue is that of *Pastor*, the legs those of *Dicrurus*.

Genus *Collurio*, Vigors.

50. *COLLURIO LAHTORA*. *Coll. pallidè griseus; strigâ frontali per oculos utrinque ad nuham extendente, alis, rectricibusque mediis nigris; corpore subtus, fasciâ alarum, scapularum marginibus, rectricibus externis, apicibusque duarum sequentium.*

Longitudo corporis 9 $\frac{1}{2}$  unc., cauda 4 $\frac{1}{2}$ .

This is the variety *C.* of *Lanius Excubitor* of Dr. LATNAM. It is closely allied to the North American and European *Lan. Excubitor*, but differs in the black bar extending across the forehead. The male has a sweet note.

51. *Collurio erythronotus*, Vigors. Proceed. Zool. Soc. I. p. 42.

This bird differs from the *Lan. Bantet* of Dr. HONAPITLU only in the crown being ash-coloured instead of black, and in the defaced black bar across the forehead.

52. Jun. ? *abdomine graciliter fasciato.*

Supposed young of the above. Length 7 $\frac{1}{2}$  inches: tail 3 $\frac{1}{2}$ .

53. *Collurio Hardwickii*, Vigors, Proceed. Zool. Soc., I. p. 42. Bay-backed small Shrike, Lath.

Genus *Lanius*, Auct.

54. *Lanius Muscicapoides*, Frankl. *Keroula Shrike*, Lath.

A rare bird. Colonel SYKES's specimen, a female, corresponds with Major FRANKLIN's specific characters, and with his specimen, a male bird.

Genus *Graucalus*, Cuv.

55. *Graucalus Papuensis*, Cuv. *Corvus Papuensis*, Gmel. *Papuan Crow*, Lath.  
Irides, rich lake.

Genus *Cebblepyris*, Gray.

56. *Cebblepyris Ambriatus*, Temm. *Echenilleur frangis* ♀ Pl. Ovi. Irides orange.

Colonel SYKES's birds, full-grown males, correspond only to the female of *Ceb. Ambriatus*; and not at all to the male. Met with only in thick hedges on the plains.

57. *Cebblepyris canus*. *Le Grand Gobe-mouche cendré de Madagascar*, Pl. Enl. 521.

Irides, intense red brown. Black ants only found in the stomach. This bird does not correspond with the later descriptions of *Ceb. canus* (*Muscicapa cana*), and the history of both these species of *Cebblepyris* requires further illustration. Found only in thick bushes. Specimens of both species from Bengal and Wynead resemble those collected by Colonel SYKES.

(To be Continued.)

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of August, 1834.

Days of the Month	Barometer reduced to 32° Fahr.			Thermometer in the Air.					Depression of Moist-bulb Thermometer.			Hair Hygrometer.		Rain.	Wind.		Weather.				
	At 4 A.M.	At 10 P.M.	At 4 P.M.	Minimum	At 10 A.M.		Max. by Reg. Ther.	At 4 P.M.		At 10 P.M.	At 10 A.M.	At 4 P.M.	Rain.		Morning.	Noon.	Evening.				
				At 4 A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.											
1	,322	,272	,178	81,5	86,6	98,0	86,4	80,8	1,5	4,6	3,9	1,0	97	98				clear.	shows.	clear.	Evening.
2	,210	,236	,110	82,0	84,0	85,5	84,9	80,4	4,0	3,0	3,4	1,1	98	98	2,20	n. e.	n. w.	rain.	rain.	rain.	hard rain.
3	,066	,098	8,820	80,4	82,4	87,8	82,0	77,3	2,6	3,1	3,0	0,0	98	99	4,10	n. w.	n. w.	lull	lull	gale, n.	high wind
4	,245	,352	9,344	81,0	82,6	86,7	83,2	79,3	2,8	3,0	3,0	0,5	99	99	,70	n. w.	n. w.	showery.	showery.	rain.	hd. gale S.
5	,349	,446	,368	79,0	82,6	85,0	84,2	82,1	0,6	2,9	3,0	1,1	99	99	,10	e.	e.	stratus.	stratus.	rain.	hazy.
6	,450	,442	,362	81,9	83,5	86,1	82,2	80,0	0,8	2,7	2,6	1,6	99	99	,35	n. e.	n. e.	cum. cir.	cum. cir.	rain.	dull-calm
7	,369	,386	,343	80,2	81,4	84,4	82,8	80,0	1,5	2,5	3,0	1,0	99	99	,50	n. e.	n. e.	rain.	rain.	rain.	hd. rain.
8	,427	,488	,396	81,4	82,3	85,3	83,9	84,0	2,7	2,6	4,1	4,2	99	99	,20	n. e.	n. e.	showery.	showery.	rain.	do
9	,427	,488	,408	81,4	82,3	85,3	83,9	84,0	3,8	2,8	4,5	3,5	99	99	,70	n. e.	n. e.	rain.	rain.	rain.	storm N.W.
10	,528	,420	,420	83,8	85,2	88,0	86,1	81,0	2,2	3,2	5,9	2,0	98	98	,05	S. W.	S. W.	clear.	clear.	clear.	clear.
11	,554	,570	,570	82,0	84,6	89,2	88,4	84,7	2,2	4,0	5,9	1,6	98	98	,45	S. W.	S. W.	cloudy.	cloudy.	cloudy.	steady rain
12	,556	,556	,478	82,2	85,6	89,5	87,1	82,0	3,1	3,0	3,8	2,3	95	94	,95	S. W.	S. W.	misty.	misty.	rain.	rain.
13	,585	,580	,488	81,5	85,2	88,7	87,1	82,0	2,9	3,0	3,7	2,3	97	97		W.	W.	cum. str.	cum. str.	rain.	threatening
14	,501	,525	,476	83,2	84,3	87,6	86,7	85,4	3,5	3,0	3,7	4,7	97	96		O.	O.	fine.	fine.	haze.	cum. cirri.
15	,519	,600	,522	84,2	84,8	89,2	87,4	84,2	2,1	3,5	4,2	3,6	96	96		O.	O.	do	do	rain.	do
16	,581	,626	,540	80,4	85,4	90,2	88,4	85,0	2,1	3,5	6,6	3,6	96	96		W.	W.	do	do	rain.	do
17	,575	,598	,524	81,1	86,4	90,0	86,9	82,0	3,9	4,0	5,1	1,2	96	96	,25	n. w.	n. w.	do	do	rain.	clear.
18	,581	,646	,572	81,0	85,6	88,9	85,9	83,1	2,0	3,3	5,2	3,7	97	95	,05	n. w.	n. w.	do	do	rain.	do
19	,659	,688	,601	81,0	85,5	88,2	87,5	83,3	3,0	4,2	7,8	3,4	96	96		e	e	do	do	clear.	fine.
20	,627	,688	,628	82,1	85,7	89,0	87,2	83,2	2,8	4,7	6,7	3,4	96	96		s.	s.	do	do	cir. cum.	cum. cirrus.
21	,696	,694	,660	78,2	85,5	89,3	87,2	80,2	2,3	5,1	7,7	2,3	97	93	,80	O.	O.	do	do	hard rn.	rain.
22	,733	,738	,672	80,0	84,9	85,0	85,7	80,0	1,9	5,6	6,7	3,5	96	94	,20	S. e	S. e	do	do	cumul.	clear.
23	,748	,780	,628	79,3	84,9	85,0	85,7	80,0	2,6	4,4	9,8	7,2	96	96	,65	O.	O.	do	do	clear.	bright.
24	,685	,681	,552	83,1	86,3	93,0	89,0	87,0	3,3	4,3	9,4	7,1	90	87		O.	O.	do	do	do	do
25	,617	,648	,508	83,4	87,9	93,0	92,3	87,0	3,2	7,9	9,6	6,5	91	87		O.	O.	do	do	do	do
26	,576	,624	,480	84,4	88,4	93,6	90,6	85,5	3,4	5,4	5,8	3,7	96	94		O.	O.	do	do	do	do
27	,589	,587	,496	83,2	88,0	91,8	89,3	84,3	2,5	6,0	5,9	3,3	93	93	,20	O.	O.	do	do	do	do
28	,576	,615	,512	82,6	88,5	93,9	87,9	81,9	2,0	5,9	5,4	2,1	95	95		O.	O.	do	do	do	do
29	,582	,630	,540	81,2	87,9	92,8	87,0	81,2	0,9	5,9	5,7	1,0	96	95		O.	O.	do	do	do	do
30	,523	,614	,516	81,0	87,2	91,1	87,6	83,0	1,4	5,9	5,2	2,8	96	96		O.	O.	do	do	do	do
31	,524	,665	,565	80,7	89,2	90,0	87,5	82,2	0,7	5,1	5,3	2,4	96	95	,40	s. e.	s. e.	do	do	do	do
Mean.	29,518	549	456	81,4	85,1	88,8	86,7	82,6	2,3	4,2	5,3	2,9	96,5	95,3	15,25	severe gale.		he. vy ran - latter half fine.			

The Barometer fell during the lull of the storm on the 3rd at 4 P. M. to 28.820. At Allahabad, whether the same storm extended, the Barometer stood on the 30 July at 29.231; on the 31st 4 P. M. at 29.160; 1 August. at 29.155; 2nd do. 29,18; 3rd do. 29,145 storm about 7 P. M. from the south-east. Great inundations occurred about the 9th 1<sup>st</sup> Burdwan, Monghyr, Patna, and Arrah; also at Nagpur, and on the west of India at Surat.

# JOURNAL

OF

## THE ASIATIC SOCIETY.

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*No. 33.—September, 1834.*

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I.—*Further Remarks on M. Remusat's Review of Buddhism.* By B. H. HODGSON, Esq. Resident at the Népál Court, &c.

Adverting again to REMUSAT'S Review in the Journal des Savans for May, 1831, I find myself charged with another omission more important than that of all mention of the Avatars. It is no less than the omission of all mention of any other *Buddhas* than the seven celebrated Mánúshis. The passage in which this singular allegation is advanced is the following: "Les noms de ces sept personuages (the '*Sapta Buddha*') sont connus des Chinois, et ils en indiquent une *infinité d'autres* dont le Bouddhiste Nipálien *ne parle pas.*"

My Essay in the London Transactions was the complement and continuation of that in the Calcutta Researches. REMUSAT was equally well acquainted with *both*; and, unless he would have had me indulge in most useless repetition, he must have felt convinced that the points enlarged on in the former essay would be treated cursorily or omitted, in the latter. Why, then, did he not refer to the Calcutta paper for what was wanting in the London one? Unless I greatly deceive myself, I was the first person who shewed clearly, and *proved* by extracts from original Sanscrit works, that Buddhism recognises, "une *infinité*" of Buddhas, —Dhyáni and Mánúshi, Pratyéka, Srávaka, and Mahá Yánika. The xvith vol. of the Calcutta Transactions was published in 1828. In that vol. appeared my first Essay, the substance of which had, however, been in the hands of the Secretary nearly three years before it was published\*. In that vol. I gave an *original list of nearly 150*

\* According to usage in that matter provided: a statement in which I request the present Secretary will have the goodness to bear me out.

*Buddhas* (p. 446, 449) : I observed that the Buddhas named in the Buddhist scriptures were "as numerous as the grains of sand on the banks of the Ganges;" but that, as most of them were nonentities in regard to chronology and history, the list actually furnished would probably more than suffice to gratify rational curiosity; on which account I suppressed *another long list*, drawn from the *Samádhi Raja*, which was then in my hands, (p. 444.) By fixing attention on that cardinal dogma of sugatism, viz. that man can enlarge his faculties to infinity, I enabled every inquirer to conclude with certainty that the Buddhas had been multiplied ad libitum. By tracing the connexion between the Arhantas and the Bodhisatwas; between the latter again, and the Buddhas of the first, second, and third degree of eminence and power; I pointed out the *distinct steps* by which the finite becomes confounded with the infinite,—man with Buddha; and I observed in conclusion that the epithet *Tathágata*, a synonyme of Buddha, *expressly portrays this transition*. (London Transactions, vol. ii. part i.) Facts and dates are awkward opponents except to those, who, with REMUSAT's compatriot, dismiss them with a 'tant pis pour les faits!' For years before I published my first Essay, I had been in possession of hundreds of drawings, made from the Buddhist pictures and sculptures with which this land is saturated, and which drawings have not yet been published, owing to the delay incident to procuring authentic explanations of them from original sources. All the gentlemen of the residency can testify to the truth of this assertion; and can tell those who would be wiser for the knowledge, that it is often requisite to walk heedfully over the classic fields of the valley of Nípál. lest perchance you break your shins against an image of a Buddha! These images are to be met with every where, and of all sizes and shapes, very many of them endowed with a multiplicity of members sufficient to satisfy the teeming fancy of any Brahman of Madhya Désa! Start not, gentle reader, for it is literally thus, and no otherwise. Buddhas with three heads instead of one—six or ten arms in place of two! The necessity of reconciling these things with the so called first principles of Buddhism\*, may reasonably account for delay in the production of my pictorial stores. Meantime, I cannot but smile to find myself condoled with for my poverty when I am really, and have been for 10 years, *accablé des richesses!* One interesting

This delay was and is a necessary evil of the publication of an occasional volume of *Researches*. It was to obviate the inconvenience in some measure that the present form of the *Journal* was adopted, but still this is inadequate to the production of papers of any magnitude, as we fear Mr. HONCSON feels by experience!—ED.

\* See ERSKINE'S *Essays* in the *Bombay Transactions*.

result only have I reached by means of these interminable trifles ; and that is, strong presumptive proof that the cave temples of Western India are the work of Buddhists *solely*, and that the most apparently Brahmanical sculptures of those venerable fanes are, in fact, Buddhist. A hint to this effect I gave so long ago as 1827, in the Quarterly Oriental Magazine, (No. XIV. p. 219;) and can only afford room to remark in this place, that subsequent research had tended strongly to confirm the impressions then derived from my very learned old friend AMIRTA NANDA. The existence of an infinite number of Buddhas ; the existence of the whole Dhyáni class of Buddhas ; the personality of the Triad : its philosophical meaning ; the classification and nomenclature of the ascetical or true followers of this creed ; the distinction of its various schools of philosophy ; the peculiar tenets of each school, faintly but rationally indicated ; the connexion of its philosophy with its religion ; and, as the result of all these, the means of speaking consistently upon the general subject\*, are matters for the knowledge of which, if REMUSAT be not wholly indebted to me and my authorities, it is absolutely certain that I am wholly *un*indebted to him and his ; for till he sent me, 10 months ago, (I speak of the date of receipt,) his essay on the Triad, I had never seen one line of his, or any other continental writer's lucubrations on Buddhism.

I have ventured to advance above that in the opinion of a learned friend, the Chinese and Mongolian works on Buddhism, from which the continental savans have drawn the information they possess on that topic, are not *per se* adequate to supply any very intelligible views of the general subject.

As this is an assertion which it may seem desirable to support by proof, allow me to propose the following. REMUSAT observes, that a work of *the first order* gives the subjoined sketch of the Buddhist cosmogony. "Tous les êtres étant contenus dans la très pure substance de la pensée, une idée surgit inopinément et produisit la fausse lumière ; Quand la fausse lumière fut née, le vide et l'obscurité s'imposèrent réciproquement des limites. Les formes qui en résultèrent étant indéterminées, il y eut agitation et mouvement. De là naquit le tourbillon de vent qui contient les mondes. L'intelligence lumineuse étoit le principe de solidité, d'ou naquit la roue d'or qui soutient et protège la

\* A learned friend assures me that " a world of Chinese and Mongolian enigmas have been solved by means of your general and consistent outline of the *system*, but for which outline the said enigmas would have continued to defy all the continental *Œdipuses*."

terre. Le contact mutuel du vent et du metal produit le feu et la lumière, qui sont les principes des changemens et des modifications. La lumière precieuse engendre la liquidité qui bouillonne à la surface de la lumière ignée, d'ou provient le tourbillon d'eau qui embrasse les mondes de toute part."

Now I ask, is there a man living, not familiar with the subject, who can extract a particle of sense from the above passage? And are not such passages, produced in illustration of a novel theme, the veriest obscurations thereof? But let us see what can be made of the enigma. This aperçu cosmogonique of the Long-yan-king, is, in fact, a description of the procession of the five elements, one from another, and ultimately from *Prajna*, the universal material principle, very nearly akin to the *Pradhán* of the Kapila Sánkhya. This universal principle has two modes or states of being, one of which is the proper, absolute, and enduring mode; the other, the contingent, relative, and transitory.

The former is abstraction from all effects, or quiescence: the latter is concretion with all effects, or activity. When the intrinsic energy of matter is exerted, effects exist; when that energy relapses into repose, they exist not. All worlds and beings composing the versatile universe are cumulative effects; and though the so-called elements composing them be evolved and revolved in a given manner, one from and to another, and though each be distinguished by a given property or properties, the distinctions, as well as the orderly evolution and revolution, are mere results of the gradually increasing and decreasing energy of nature in a state of activity\*. *Upáya*, or 'the expedient', is the name of this energy;—increase of it is increase of phenomenal properties;—decrease of it is decrease of phenomenal properties. All phenomena are homogeneous and alike unreal; gravity and extended figure, no less so than colour or sound. Extension in the abstract is not a phenomenon, nor belongs *properly* to the versatile world. The productive energy begins at a minimum of intensity, and increasing to a maximum, thence decreases again to a minimum. Hence *ákásh*, the first product, has but one quality or property; air, the second, has two; fire, the third,

\* Causes and effects, quoad the versatile world, cannot be truly alleged to exist. There is merely customary conjunction, and certain limited effects of proximity in the precedent and subsequent, by virtue of the one true and universal cause, viz. *Prajna*. With the primitive Svobhávikas cause is not unitised: for the rest, their tenets are very much the same with those above explained in the text, only their conclusions incline rather to scepticism than dogmatism. It may also perhaps be doubted whether with the latter school, phenomena are unreal as well as homogeneous. In the text, I would be understood to state the tenets of the Prajnikas only.

has three; water, the fourth, has four; and earth, the fifth, has five\*.

These elements are evolved uniformly one from another in the above manner, and are revolved uniformly in the inverse order.

*Súnyatá*, or the total abstraction of phenomenal properties, is the result of the total suspension of nature's activity. It is the *ubi*, and the *modus*, of the universal material principle in its proper and enduring state of *nirvriti*, or of rest. It is *not* nothingness, except with the sceptical few. The opposite of *Súnyatá* is *Avidya*. Now, if we revert to the extract from the *Long-yan-king*, and remember that *la pensée* † *l'intelligence lumineuse* †, and *la lumière précieuse* † refer alike to *Prajna* the material principle of all things, (which is personified as a goddess by the religionists,) we shall find nothing left to impede a distinct notion of the author's meaning, beyond some metaphorical flourishes analogous to that variety of descriptive epithets by which he has characterised the one universal principle. *Tourbillon de vent*, and *tourbillon d'eau*, are the elements of air and of water, respectively; and *le principe de solidité* is the element of earth.

“Tous les êtres étant contenus dans la pure substance de *Prajna* une idée surgit inopinément et produisit la fausse lumière :”—that is, the universal material principle, or goddess *Prajná*, whilst existing in its, or her, true and proper state of abstraction and repose, was suddenly disposed to activity, or impressed with delusive mundane affection (*Avidya*). “Quand la fausse lumière fut née, le vide et l'obscurité s'imposèrent réciproquement des limites.” The result of this errant disposition to activity, or this mundane affection, was that the universal void was limited by the coming into being of the first element, or *ákásh*, which as the primary modification of *Súnyatá* (space) has scarcely any sensible properties. Such is the meaning of the passage “les formes qui en résultèrent étant indéterminées,” immediately succeeding the last quotation. Its sequel again, “il y eut agitation et mouvement,” merely refers to mobility being the characteristic property of that element (air) which is about to be produced. “De la naquit le tourbillon de vent, qui contient les mondes.” Thence (i. e. from *ákásh*) proceeded the element of the circumambient air. “L'intelligence lumi-

\* There is always cumulation of properties, but the number assigned to each element is variously stated.

† *Prajna* is literally the supreme wisdom, videlicet, *of nature*. Light and flame are *types* of this universal principle, in a *state of activity*. Nothing but extreme confusion can result from translating these terms au pied de la lettre, and without reference to their technical signification. That alone supremely governs both the literal and metaphorical sense of words.



neuse étoit le principe de solidité, d'où naquit la roue d'or qui soutient et protège la terre." *Prajna* in the form of light (her *pravrittika* manifestation) was the principle of solidity, whence proceeded the wheel of gold which sustains and protects the earth. Solidity, the diagnostic quality of the element of earth, stands for that element; and the wheel of gold is mount Merú, the distinctive attribute of which is protecting and sustaining power: this passage, therefore, simply announces the evolution of the element of earth, with its mythological appendage, mount Merú. But, according to all the authorities within my knowledge, earth is the *last* evolved of the material elements. Nor did I ever meet with an instance, such as here occurs, of the direct intervention of the first cause (*Prajna*) in the *midst* of this evolution of the elements. "Le contact mutuel du vent et du *metal* produit le feu et la lumière, qui sont les principes des changements." The mutual contact of the elements of air and of *earth* produced fire and light, which are the principles of change. This is intelligible, allowance being made for palpable mistakes. I understand by it, merely the evolution out of the element of air of that of fire, of which light is held to be a modification. To the igneous element is ascribed the special property of heat, which is assumed by our author as the principle of all changes and transformations. Metal for earth is an obvious misapprehension of REMUSAT'S. Nor less so is the false allocation of this element (earth) in the general evolution of the five, and its introduction here.

"La lumière précieuse engendre la liquidité qui bouillonne à la surface de la lumière ignée, d'où provient le tourbillon d'eau qui embrasse les mondes."

*Prajna* (in the form of light) produces the liquidity which boils on the surface of igneous light, whence proceeds the element of water embracing the world.

This figurative nonsense, when reduced to plain prose, merely announces the evolution of the element of water from that of fire. Our terrestrial globe rests upon the waters like a boat, according to the Buddhists; and hence the allusion (embracing the world) of the text. What is deserving of notice is the direct interference, a *second time*, (and in respect to earth, a third time,) of the *causa causans* with the procession of the elements, one from another. All my authorities are silent in regard to any such repeated and direct agency; which amounts in fact, to creation properly so called—a tenet directly opposed to the fundamental doctrine of all the *Swobhāvikas*. Certain Buddhists hold the opinion, that all material substances in the versatile world have no existence independent of *human* perception. But that the Chinese

author quoted by Mr. REMUSAT was one of these idealists, is by no means certain. His more immediate object, in the passage quoted, evidently was, to exhibit the progression of the five material elements, one from another. To that I at present confine myself, merely observing of the other notion, that what has been stated of the homogeneousness and unreality of all phenomena, is not tantamount to an admission of it. The doctrine of *Avidya*, the mundane affection of the universal principle, is not necessarily the same with the doctrine which makes the sentient principle *in man* the *measure of all things*\*. Both may seem, in effect, to converge towards what we very vaguely call idealism; but there are many separate paths of inquiry by which that conclusion may be reached.

*Nipál, Aug. 1834.*

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II.—*Note on two Coins of the same species as those found at Behat, having Greek inscriptions. By Major D. L. STACY, (Plate XXV.)*

[In a letter to the Sec. As. Soc. read at the Meeting of the 2nd July.]

I have the honor to enclose a facsimile of a copper coin purchased by me at Chittore Gurh.

It was my intention to reserve any notice of this coin, till I ascertained if my good fortune would send me others, more distinct, and consequently more satisfactory; but on reading the description of the famous stone pillar at Allahabad, given in your number for March, 1834, (No. 27,) I am induced to submit a few remarks with the copy of the coin†.

The style of the Greek character would, alone, be sufficient to stamp this coin as provincial, were the chungahs or symbols on the obverse, and monogram on the reverse, less distinct, or even obliterated. The suggestions of Lieutenant BURT, and Mr. STIRLING, viz. that the characters on the Allahabad Pillar No. 1, resembled the Greek, drew my attention to the plate, when it immediately occurred to me, vice versâ, that these provincial Greek characters, on my coin, might have taken their style or fashion from the writing of the dynasty, or descendants of the dynasty, which owned this pillar.

\* *Manas*, the sixth element, is the sentient principle in man. The Chinese author mentions it *not*, unless the passage beginning "*la même force*," and immediately following that I have quoted, was designed to announce its evolution. That passage as it stands, however, does not assert more than the homogeneousness of this sixth element with the other five.

† The original coins were subsequently sent, and are depicted as figs. 2 and 3, of plate xxv.—ED.

That the Greeks did send as a subsidiary force to the assistance of CHANDRAGUPTA, son of NANDA, Rájá of the Prachi, I believe no one doubts; and contrasting all circumstances on the subject within our knowledge, we may fairly presume, that the services of this subsidiary, were paid by a grant of land (*Jaédad*).

IN CONDER'S "Modern Traveller," speaking of these times, after relating the death of the aged NANDA by poison (given by his minister SACATARA), he proceeds, vol. vii. page 123. "The crime did not, however, go unpunished; SACATARA and all his sons, except one, were put to death; and to secure himself against hostile claimants of the crown, UPADHANWA gave orders for the massacre of all his half brothers, the children of NANDA by different mothers. CHANDRAGUPTA alone escaped, and fled to the court of PARVATESWARA 'Lord of the Mountains' or King of Népal; to whom he offered one half of his kingdom if he would assist him in taking the field against his enemy.

"In conjunction with this powerful ally, aided by a body of *Greek auxiliaries*, CHANDRAGUPTA defeated UPADHANWA with great slaughter under the walls of his capital, the monarch himself being among the slain, and took possession of the throne of his father. His promise to PARVATESWARA was now disregarded. He retained a large body of *Yavuns* or *Greeks* in his pay, and fortifying his capital, set his enemies at defiance."

Concluding the Greek auxiliaries were paid by a grant of land, as by agreement the Nepális were to have been, and at the period CHANDRAGUPTA sought Greek assistance, he could have had no other means of paying them. Considering also, that the high estimation they were held in, caused them to be retained after the object, which brought them to Pryag, was accomplished, we may naturally conclude that the "*Jaédad*" granted to this subsidiary was very considerable.

The value of the services of the Greeks had been shewn, 1st, in the aid lent in placing CHANDRAGUPTA on the throne of his ancestor; 2ndly, in enabling the newly made king to retain that half of his territory, which he had pledged in case of success as a recompense to the Lord of the Hills.

These were services already performed: and to people, who had proved themselves so useful in his recently acquired kingdom, CHANDRAGUPTA, must for every reason, have given a substantial proof of his consideration. The marriage of CHANDRAGUPTA to the daughter of SELEUCUS\*, must have added strength to the position of the Greeks amongst

\* TODD in his *Rajast'han*, vol. i. p. 671, makes SELEUCUS marry the daughter of CHANDRAGUPTA, instead of CHANDRAGUPTA marrying a daughter of SELEUCUS. This is evidently an oversight.

the Prachi, and the appointment by **SELEUCUS** of the celebrated **MEGASTHENES** as resident at the court of his Rájá son-in-law, went as far as human wisdom could do, in adding stability to their footing.

It requires more experience in numismatic lore than I can boast, to explain the meaning of the different symbols or "Chungahs" on this coin. The obverse has the word "Soter" very distinct: what letters follow I cannot say; they certainly are not the same character, but what they are, must perhaps remain a secret till further research gives us a more complete coin by which to determine. The j'har or branch is distinct, (can this be the olive branch?) the other Chungahs I cannot decipher. The monogram on the reverse is the same as that on some coins in my possession, having an elephant on the obverse\*.

The Greek jaédad or territories we may suppose grew into consideration much the same as did the Honorable Company's after their first footing: and like the infant Company too, we may suppose, the Greeks established a currency of their own, though more perhaps with a view of handing down their achievement to posterity than as a necessary medium of barter, and I think the coin (the subject of this communication) bears every mark of being of those times, of the Chandra-gupta dynasty.

*Note on another Coin of the same type procured by Licut. A. Conolly,  
\* at Kanouj, by the Secretary.*

At the moment of perusing Major Stacy's remarks on the indications of a Greek inscription on the *Behat type* of coin, as it may continue to be designated until its origin be better determined, and with his two coins before me, (Pl. xxv. figs. 2, 3,) corroborating his reading†; I am most opportunely put in possession of another scion of the same stock speaking a totally different language!

Licut. CONOLLY has already had the good fortune to make known a valuable Kanouj coin with a legible inscription, in the language and character of the Allahabad column, (inscription No. 2.) His zealous exertions have again conducted him to a brilliant discovery at the same place, of the very nature we could have desired at this moment—a coin of the Behat type, bearing a clear and distinct inscription: and that inscription in the *unknown character No. 1.* of the Allahabad column! Two of Mr. MASSON's coins, it will be remembered, bore characters which were pronounced to be of this alphabet. They were

\* No. 27, Journal Asiatic Society, page 121, line xvii. The Elephant appears to have been one of the Symbols of the CHANDRAGUPTA dynasty.

† It should be remarked however that the apparently Greek letters when inverted resemble closely the Delhi character: it will be wrong therefore to assume positively that they are Greek.

of AGATHOCLÉUS and of PANTALEÓN, of rude fabrication, and connected through the device of a lion with another singular coin having the ☉ symbol. These are now again brought into a double alliance with the coins of Behat and Kanouj, by the character in which the inscription is cut.

On the present silver coin there are five distinct letters, all of which will be found in the analysis of the alphabet, page 112 of the present volume. I cannot attempt as yet to transcribe these mysterious symbols in any more familiar character, but it is not too much to hope that ere long another prize from Kanouj may put us in possession of an inscription in two languages, one of which will be known and will serve as a key to the whole: meantime I proceed to describe the peculiarities of the present coin.

*Obverse.* A horse standing unattended and naked. In front appears a line of double curvature, which from analogy may be a faint trace of the lotus stalk held by the female in the Behat coin (fig. 1. Pl. xviii.)

*Reverse.* On the left, the tree symbol with its chequered frame: on the right, a new form composed of two circles touching, traversed by a common diameter, which continues above and supports an inverted crescent. Below comes the inscription before mentioned in large and clear letters: in the centre of the field is a crescent, or new moon. Above the recumbent moon is a small animal standing upon her horns, which resembles very closely that depicted on the reverse of the coin from *Behat*, fig. 1, plate xviii. The connection of this animal with the moon seems to imply some astronomical allegory: were it clearly a horse, we might imagine it to signify the new moon in the month of *Aswini* or in the lunar mansion of that name, the first of the 27 *Nakshatras* of the lunar zodiac, corresponding as is supposed with the star  $\gamma$  or  $\beta$  *Arietis*; in which case it might be thought to point to some event that happened at a particular epoch. Should the animal be of the deer genus, it may be taken for *SASIN*, the antelope or roe (sometimes translated a hare) always attendant on *CHANDRA*, and supposed to have been allotted to him from a fancied resemblance of the marks on the moon's face to the spotted skin of this animal\*. Sir *WILLIAM JONES* alludes to this attribute of the moon in his hymn to *SURYA*:

"Thou nectar beaming Moon,  
Regent of dewy night—  
From yon bright roe that in thy bosom sleeps  
Fawn spotted, *SASIN* hight—"

The compound image may further be emblematical of princely dignity; similar in import to the various armorial bearings among European nations; thus, in the ancient copper plate grant of land dug

\* See *MOON'S HINDU PANTHEON*, p. 293.

up at Tripura in 1803, and decyphered by Mr. COLEBROOKE, (As. Res. x. 403,) we find the expression:—

“ From him sprung the happy chief of ministers, who exhibits the joys of unsullied glory: a spotless moon, among mortals, at sight of whom the *hare spotted luminary* appears swollen with envy and distempered with alternate increase and wane.”

I will here close this unsatisfactory tissue of conjectures, regretting that the time is not yet ripe for doing justice to Lieut. CONOLLY'S second boon towards the solution of a faintly dawning point in the pervading obscurity of Indian history.

J. P.

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After engraving the figures of the three coins just described, Dr. SWINEY arrived in Calcutta with his rich cabinet of ancient coins. In it I discovered several connected with the same groupe, which he was kind enough to place in my hands. I had however reserved only room for one or two, (figures 4 and 5,) and have been obliged to content myself with the legends of the others (*b, c, d* and *e,*) to show the resemblance of the character to the Kauonj Nágarí alphabet. I cannot describe these coins better than in Dr. SWINEY'S own words.

“ Several of them are rare, particularly the two larger with the antelope goat on one side and the warrior on the other; smaller ones of this description are not uncommon in the neighbourhood of Scháranpur. I mean in the smaller towns, and certainly not all brought from the newly discovered deposit at *Behat*. The first of the kind that I met with was stated to be brought from *Hardwár*; and there was so marked a character of the *hill goat* upon it, that it was natural to connect it with some long forgotten dynasty in the Sewálic range. There is an account to be met with somewhere, of a certain Rájá of Kemaon, by name SAKWANTA, whose domain was invaded by a certain RAJPA'L of Indrápresthá. It seems that in this case the aggressor was defeated, and SAKWANTA obtained and kept possession of the regal abode for fourteen years.

But perhaps mythology is a better key to the true interpretation of old coins. Here we have a series of coins more or less connected one with another by some common symbol of a Jain type: on one coin the horse, on another the antelope or goat, on another the hieroglyphic called Swastiká, on another the *sankh*, or sacred shell; the character of the reverse or obverse bearing some common *jantra*, sufficient to indicate the series.

Then we possess Colonel Tod's testimony to the existence of such a series; for he says, he has in his possession a full series of Jain coins. I do confess however, that my belief in these coins being Jain was

shaken by the discovery of the two larger coins (figs. 4 and 5) : on the obverse of these we have the warrior figure of SIVA or his son SCANDA KUMARA, with the huge Sivian spear alluded to in MOOR'S Hindu Pantheon. On comparing this figure with the obverse of Nos. 37 and 38 of WILSON'S plates, it will be difficult to admit one and not the other among Jain coins. If rejected as a Jain coin, it may be worthwhile to read WILFORD'S story of SIVA'S *rusticating* himself on the banks of the Bágmatí : hence called, as writes the same authority, in some vol. of the Asiatic Researches, *Mrigasringo* : the tradition is that once upon a time SIVA appeared in the shape of an antelope, whence he took the name of *Hariniswara*, or in other words *Harinisú*, or lord of the antelope.

Perhaps as we progress to perfection in the newly discovered Sanscrit letters, the inscription upon at least three of the coins now sent will throw some light upon the subject."

Figures 12, 13, 14 and 15, of plate xxvi. are four coins dug up in the Doáb near Allahabad, and presented to the Society, by Mr. SPIERS on the 3rd September. They appear to belong to the same class as the preceding, having a rudely executed bull on one side, and the *jhár* or branch on the other, with some ill-defined letters in strong relief and a straight chequered border below. The *jhár*, in the present day it should be remembered, is the symbol distinctive of the Jaipur and Chitore coins. The *trisul*, of those of Srinagár and Ságar. In due course of time we may be able by means of these marks to trace each species to its original locality.

Fig. 9. is a small copper coin among Dr. GERARD'S series, bearing a bull on one side and the well defined Kanouj Nágari letters राजश्री *rāja srī* on the reverse. There are two or three others of the same kind, in his collection. J. P.

### III.—Continuation of Observations on the Coins and Relics, discovered by General VENTURA, in the Tope of Mánikyála. By J. PRINSEP, Sec. &c.

It is with some diffidence that I now proceed to offer a few remarks in illustration of the *Mánikyála* treasures, knowing the great disadvantages under which any attempt to investigate even what may be thought so simple a matter as the antiquity of the monument must labour, when unassisted by previous knowledge of the history, mythology, or current languages of the period and of the locality to which it belongs. My object, however, is to place all the circumstances which the collateral discoveries of Messrs. MASSON, MARTIN, BURNES, GERARD, and

KERÁMAT ALI, have brought to light, before the antiquaries of Europe, and then to await their decision on the facts: it being my own duty to act as a faithful witness before this superior tribunal, nothing exaggerating, and nothing extenuating, in the delineation of figures and inscriptions, such as they appear in the originals now in my possession.

The subject which I propose to elucidate on the present occasion is, that of *the coins connected with the tope of Mánikyála*; as they naturally stand forward most prominent in offering materials for fixing the date of the building.

We learn from the “*état des travaux,*” that forty-four copper medals were found buried along with the principal cylinder, and several others in different parts of the masonry, besides the gold and silver coins enclosed in the cylinders themselves. On attempting a classification as far as their mutilated condition would allow, these were all (with the exception of two) found to be referrible to the five species depicted at the foot of plate xxii: being in the following proportion:

Of figure 31, (shewn hereafter to belong to the Kanerkos groupe),—large, ..	20
Of the same type, but smaller, (fig. 9, pl. xxv.).....	17
Of the elephant type, (fig. 28, pl. xxii.).....	15
Of the figure sitting with one foot up, (fig. 29, of do.) .....	12
Of the figure sitting cross-legged, (fig. 32, of do.) .....	4
Of the bull and raja, or Kadphises coin, (fig. 4, of pl. xxvi.).....	2

with ten others which were too much defaced to admit of classification.

Although among these coins very few have legible inscriptions, the collections of Dr. GERARD and of SAYED KERÁMAT ALI, in conjunction with the specimens depicted by Mr. MASSON, have furnished materials for decyphering them, in considerable abundance; indeed, of the several groups specified above, I have before me upwards of three hundred coins, of which thirty-two exhibit more or less of the bull and raja inscription: twenty that of the elephant coin: as many more that of the Kanerkos legend; and half a dozen that of the seated figures.

But, before entering upon the description of these coins, of which it must be remarked that we do not know the date *a priori*, although from their possessing Greek inscriptions, we necessarily refer them to an age not very distant from the Bactrian dynasty, it will be more satisfactory to bestow a little further attention upon the silver coins found in the first gold box (see page 317,) which I have already stated generally to belong to the known dynasty of the Sassanidæ, without however venturing to contract their date within narrower limits than the duration of that monarchy, namely, from the third to the seventh century of the Christian era.



*Sassanian Coins of Mánikyála.*

'The characters on the obverse of the Sassanian coin (fig. 8, pl. xxi.) are not sufficiently distinct to enable us to decypher the name, even by placing it in juxtaposition with others of the same kind, which Sir R. KER PORTER states to have been read by himself "on the principles laid down by the Baron DE SACY."

There is one peculiarity however, which (supposing his reading to be correct) will serve our purpose equally well in identifying it. I allude to the very curious ornament of two wings embracing a crescent and star on the cap of the monarch. The same ornament is visible in a coin depicted by the author just mentioned in fig. 8, plate lviii. of his travels in Georgia and Persia, and the following is the account given of it in page 130, vol. ii. of the same work.

"This piece of money is more frequently met with than any other of the Sassanian dynasty. It is larger than most of the ancient currency, and on the whole very slightly executed. The diadem of the king has the singularity of being more in the shape of a helmet than a crown; it is winged, but surmounted by a crescent and star, instead of the customary globular form. The bust is encircled by a triple range of pearls, marked in equidistant divisions by a star and crescent. The letters which compose the legend are very complicated, running into each other like rapid writing. On the face of the medal they produce *shapúri mezdezn*, &c. and on the reverse, *shapúri*, with other letters too defaced to decypher. This SAPOUR must be the second of that name, (the seventh in descent from the first, who was the conqueror of Valerian;) and he also was a great man, being surnamed *Zulaktaf*, and renowned for his victories over the Roman emperors JULIAN, CONSTANTIUS, &c."

It must be remarked however, that the head-dress of the coin differs from that of the sculpture of this monarch at *Takht-i-Rustam*, where his name and titles are inscribed in legible Pehlevi\*.

SAPOR II. came to the throne on the hour of his birth, in A. D. 310, and reigned nearly seventy years, which is itself a strong reason in favor of his coins being more numerous than those of other Sassanian princes, and so far corroborates the appropriation of the winged head-dress to him. He was more than once engaged in repelling the Tartar and Arab invaders of his territories. It was from his clemency to the Arabs that he obtained the surname of *Zulaktáf*, which HERBELOT

\* I was not aware until seeing it in KER PORTER that this character had been satisfactorily decyphered; unfortunately, the As. Soc. Library does not contain a copy of DE SACY'S *Memoire sur les divers antiq. de la Perse*, which furnished KER PORTER with the key to its alphabet.

explains to signify "aux épaules." Other Persian historians however, according to HERBELOT, make the title of this monarch *Zúlaknáf* "aux ailes," or with the wings, interpreting it as an allusion to his clemency towards his Arab enemies, whom he on some occasion spared from massacre: taking it in its literal sense it may have applied to his usual head-dress, or metaphorically the title may have perhaps been typified by the device of wings upon his cap in the coins and effigies of the monarch. Assuming it to be satisfactorily proved any at rate that the silver coin in question belongs to this sovereign, we have at once a limit to the antiquity of the tope of Mánikyála, in the reign of SHAPUR II., that is, between the years of the Christian era 310--380: for it is natural to suppose that the coins deposited were of the species current at the time, as it has always been customary in the nations of the west so to deposit the current coins of the place on laying the foundations of temples, bridges, and other public works. Thus then we contract the date of the erection within the narrow space of these seventy years, which may be esteemed a sufficient approximation, in the absence of more positive information on the subject.

Before quitting the subject of the Sassanian coin, I must notice the other two coins already stated to assimilate with the Sassanian type, namely, figs. 10 and 11, of plate xxi. The headdress in these is also remarkable for the wings; although the absence of bushy hair and beard, attended with a difference of feature, forbid their being ascribed to the same prince, or at least to the same year of his reign. The chief peculiarity of these coins is their Devanágari legend, which however illegible it may be in parts, contains the initial title of respect, *Sri*, repeated twice and in the same relative position—before the title and before the name itself,—as is customary with Indian monarchs; for instance, *Sri Maharájádhi Rája Sri Chandra Gupta, &c.* The name itself may probably be foreign.

The reverse of these coins, no longer a fire-altar with its attendant priests, bears a rudely executed front face with a head-dress of a peculiar form. Fortunately among the coins procured at Kábul by SAYED KERÁMAT ALI, there is one which serves in a great measure to clear up the mystery of this ornament. I have depicted it as figure 6, of plate xxv. On one side of it we see the front face, and winged crown of *Zúlaknáf*, SHAPUR II., with the precise ornaments on the margin of the obverse described by KER PORTER, and no Sanscrit epigraphic; while on the reverse we have the mysterious head-dress of figs. 10 and 11, and the legible Devanágari inscription *Sri Vásu d'iva*, which is the patronymic appellation of KRISHNA the Indian Apollo.

At the epoch now established as the date of the tope, the ancient religion of Persia, the worship of the sun, or *Mithras*, had not only been restored to its former splendour among the Persians themselves, but it is acknowledged to have exercised a powerful influence on all other religions prevailing at the same time: even the Christian religion was tinged with many of the mysteries of the Mithriac worship\*, and an attempt had been made by SCYTHIEN, TEREBINTHUS†, and lastly by MANES, in the latter part of the third century, and in the very court of the Persian monarch, to incorporate the doctrines of CHRIST with the mysteries of ZOROASTER, in a system of his own, known to the Alexandrine Church as the Manichean heresy.

It is not surprising therefore that on the Indian side of the Persian monarch's dominions, in a part probably under his influence if not directly under his sway, we should find the fire-altar, or the image of the sun, replaced by KRISHNA among the Hindus, or BUDDHA among the Bauddhists; both of them personating the sun in their respective mythologies.

Whatever forms of the Hindu religion were prevalent at the time, the adoption of the sun as the ostensible representation of divine power, either in accordance with the commands of the ruling prince, or from a natural tendency towards an union of the Brahmaical and Magian faith, could not present many difficulties. "We must not be surprised," says Sir WILLIAM JONES, "at finding that the characters of all the pagan deities, male and female, melt into each other, and at last into one or two; for it seems a well-founded opinion, that the whole crowd of gods and goddesses, in ancient Rome and modern Varânes (Benares), mean only the powers of nature, and principally those of the sun, expressed in a variety of ways, and by a multitude of fanciful names‡."

\* "La fête nommée 'Celle de la naissance du soleil invincible' (natis solis invicti) tombait au VIIIe des calendes de Janvier, ou au 25 Décembre. Environ à la même époque, quelques jours après le solstice d'hiver, se célébrait la grande fête des Perses appelée *Mirrhan* (*Mihira*, soleil; *yâhan* fête) mot qui exprime une idée analogue. L'une et l'autre de ces deux solennités avaient également rapport à Mithras. Les chefs de l'église d'occident fixèrent au même jour la célébration de la naissance du Christ, dont l'époque était demeurée inconnue jusques là." *Religions de l'antiquité, traduit de l'allemand du D. F. CREUZER, par J. D. GUIGNIAUT.*

† The assumed name of TEREBINTHUS, (BUDDAS,) has given rise to conjectures of his connection with the Hindu sacred personages of the same name, and the ancient fathers actually ascribed many of the traditions of the Bauddhists to this heretic. HYDE, however, shews the origin of their mistake. Buddas in Chaldaic has the same signification as Terebinthus in Greek, and this was the cause of his changing his name. See WILFORD'S speculations on the subject, *As. Res.* ix. 215.

‡ *As. Res.* vol. i. page 267.

The kind of radiated *coma* which surrounds the head-dress of VÁSUV DE'VA in our coin (fig. 6, pl. XXV.) may be readily imagined to represent the glory or brilliant effulgence of the sun; it resembles somewhat the glory round the head of Surya, in Moor's Pantheon, plate LXXXVII. The same ornament appears on the reverse of the two coins from Mánikyála (figs. 10 and 11, pl. XXI.) but the name VÁSUV DE'VA is wanting in these, and the Sanscrit legend is confined to the obverse, where it evidently marks the name of the young king with the winged helmet.

If the winged head-dress be considered then the exclusive mark of SHAPUR II. we may suppose him to have possessed provinces in India, wherein he struck money, with his name and titles in the Nágari character; and where, to avoid offending the prejudices of the people, he omitted the altar of Mithra, and adopted the Hindu divinity which concided nearest with the object of his own worship.

While we have this evidence of Indo Sassanian rule in some quarter of the Panjáb, another of our coins, though but one, would seem to point out a similar connection with the Bactrian provinces. Among the coins of the *Kudphis* group sent down by KERAMAT ALI, are two gold ones of very inferior fabrication, thin like the Sassanian coins, and differing in many respects from the class of coins to which they are otherwise allied. One of these is depicted as fig. 10, of plate XXVI. The other is similar, except that the headdress of the prince is surmounted by a *pair of wings and globe*, as separately shewn in fig. 11. I thought at first that the *coma* might be spurious, being of gold and so vastly inferior in execution to its fellows, but it will be seen hereafter that its authenticity is well established: it is sufficient in this place to point out the above curious fact; and I therefore now proceed to review the other coins of the Mánikyála\* tumulus, with the hope rather of applying the epoch already found from the Sassanian coin, to the history of these, than to draw from the latter any additional light regarding the age of the monument.

*Obverse of the coins of Kanerkos.*

Beginning then with the two gold coins preserved in the cylinders of the same metal, the first remark which occurs on their inspection is, that Greek characters were still in use in the provinces of Kábul and the Panjáb in the fourth century: corrupted to be sure, but still retaining more of their original form than those of the latter Arsacidæ, or of the first Sassanidæ of Persia, a century anterior to them in date.

\* The Sanscrit legends on the two Mánikyála coins, have resisted the attempts of all the pandits to whom I could refer; even with the aid of a conjecture that they might refer to SHAPUR II. of Persia, or, though less likely, to KRISHNA.

The next observation which offers is, that none of the words of the inscription are Greek; neither the titles of the Indoscythic sovereigns of Bactria, ΒΑΣΙΛΕΥΣ ΒΑΣΙΛΕΩΝ, nor even Greek terminations to the words, being any longer apparent (with exception of two ΚΑΔΦΗΣΣ coins upon which the Greek legend was barely perceptible). It was not until I had carefully analyzed all that was legible of the fresh supply of coins of the same nature, that I was able to distinguish the direct *consanguinity* of the whole of these barbaric descendants with their comparatively pure progenitors above mentioned.

Nearly the whole of the Bactrian series of coins is now known to us.

Those of pure Grecian fabrication, such as the beautiful silver medal of EUTHYDEMUS brought down by Lieut. BURNES, of which Dr. GERARD has recently favored me with a duplicate, simply bear the head of the sovereign on the obverse, and his name, along with a figure of JUPITER, HERCULES, or some other god, on the reverse, after the fashion of their Syrian prototypes\*.

The coins of MENANDER, APOLLODOTUS, and EUCRATIDES, as well as those of ANTILAKIDES, HERMÆUS, UNADPHERROS, and other princes made known through Mr. MASSON'S successful researches, have invariably an inscription in Pehleví or some unknown character on the reverse, while the name and titles of the sovereign, instead of running straight across the field as in the Macedonian coins, encircle the device on the obverse, in the manner of the Roman coins of the same period, which were then no doubt current extensively in the east.\*

The Pehleví inscription continues on the coins of ΚΑΔΦΗΣΣ, which we may conclude from their comparative rarity in the Mánikyála collection to have belonged to a different province from those of *Kanerkos*, or to have been antecedent to them by a period sufficient to render them scarce in the district!

The fortunate discovery by Dr. MARTIN HONIGBERGER of one of the coins of this prince in a tope near Kábul, corroborates the idea of a separate seat of government; and the device of the bull (and SIVA?) points to a different creed from that of the *Kanerkos* series, which bear an image, as will presently be shown, of the sun; and thus appear more nearly allied to the Persian creed.

At the period however, of the erection of the Mánikyála monument, a considerable change had taken place in the designation of the princes of *both* countries: at least we find a similar alteration in the inscription of the coins of both; the devices in other respects remaining unaltered or only deteriorated in execution.

\* See Journal As. Soc. vol. ii. plate xi.

The alteration to which I allude, is the omission of the Greek title ΒΑΣΙΛΕΥΣ ΒΑΣΙΛΕΩΝ, and the substitution of ΠΑΟ ΝΑΝΟ ΠΑΟ, or simply ΠΑΟ. That such was the case may be proved from numerous coins in Mr. MASSON'S plates; I have however endeavoured to make the transition still plainer by placing together in Plate XXV, drawings of the coins which I imagine to be thus allied. Figures 7 and 8, are from very perfect specimens of the genuine Kanerkos coin in copper, the first sent me by KERAMAT ALI, the second by Dr. GERARD: while figures 10 and 11, are from other equally well preserved coins in my own enriched cabinet. The devices will at once be pronounced to be identical.

Of the legend on the first two coins I need add nothing to what has been before said: of the others, I have collected, to the right hand of figure 10, the various readings extant, and, beginning on the right hand, we find as before stated ΠΑΟΚΑ . . . . ΝΗΡΚΙ, which I suppose to be equivalent to βασιλεὺς Κανηρκου\*; the break between ΚΑ and ΝΗΡΚΙ seeming to have been merely caused by the want of space below the device, while the dots between the Α and the Ν may be intended to denote their immediate connection.

If we now turn to the Kadphises group in Plate XXVI. we find precisely the same change of designation, at the foot of the plate on the right-hand side, where for the sake of saving space, the terminating words only of the Greek inscription are engraved.

The first part of the full inscription on the elder type of these coins, both the large and the small, is correctly given by Mr. MASSON, as ΒΑΣΙΛΕΥΣ ΒΑΣΙΛΕΩΝ ΣΩΤΗΡΜΕΓΑΣ †. The name ΚΑΔΦΙΣΗΣ is itself not very distinct in any of the ten coins whence my inscriptions are copied, but coupled with Mr. MASSON'S authority, it may be fully relied on. The intervening letters are more uncertain: the various readings are ΟΟΧ, ΟΚΜΟ, ΟΟΚΜΟ, ΟΟΗΝ, ΟΟΜΟ. The two *omicrons* cannot well be intended

\* We have no authority for writing it *Κανηρκος*, since it always occurs with the genitive termination *ου*, although united to *βασιλεὺς* in the nominative.

† Mr. MASSON'S Memoir is so full on the subject of the Kadphises coins that I have not thought necessary to add any thing thereto. I may here however point out that the portion of Colonel TOP'S bull and raja coin, which SCHLEGEL could make nothing of (As. Res. xvii. 579), has been successfully developed by the more perfect specimens now obtained. What the Professor decyphered as ΙΗΡΝΙΕΙΟ and ΕΔΟΒΙΓΓΙΟ are evidently (supplying the two first letters of *saviour*) ΣΩΤΗΡΜΕΓΑΣ ΚΑΔΦΙΣΗΣ. SCHLEGEL considered the name to be of a Tartar Khan, or Indo-Scythian prince. Colonel TOP however leaned to a Parthian origin, whilst the Bactrian kingdom was subject to Parthian kings; this view seems the most probable from several considerations, such as the fire-altar, the costume, and the *Pehlevi* inscriptions.

as stops to denote the termination of the inscription, to which purpose they would be applied in the Zend, or Pehlevi; nor can the intervening word be an epithet, coupled with *μεγας*, for the same word occurs on the gold medal found by Dr. MARTIN\*, with the simpler form ΒΑCΙΑΕΥC ΟΟΗΜΟ ΚΑΔΦΙCΗC. The only probable conjecture is this, that *Ookmo* or *öhemo* may be a part or an adjunct of the name of the prince.

Quitting this dubious ground, and descending to the inferior coins of the bull type, we find legends 11, 12, 13, 14, and 15, expressing more or less legibly the same term PAO NANO observed on the *Kanerkou* group.

In the same manner, fifteen of the elephant coins afford some entire, and some in part, the legend PAO NANO PAO in place of the title, and some few, as that depicted in the figure 31, of Plate XXV. have the word KENPANO, which until contradicted by more satisfactory testimony we may assume to be the prince's name on this coin. In some coins this name seems written KENOPANO.

The two copper coins having seated figures, 29 and 32, of the *Mánikyála* Plate, XXII; also 32 of Plate XXV., and 3 of Plate XXVI.; have, though in fewer examples, furnished unequivocal fragments of the same legend or title, PAO NANO....

The coin with the running figure, on the contrary, has only (in the three legible samples of our collection) yielded portions of PAO KA.... NHPKI, and is therefore in all respects similar to the secondary form of the *Kanerkou* medals. The above includes all of the Indo-Scythic type yet known: Mr. MASSON restricts them to four distinct sets (page 174), and in fact so judicious had been his survey of the group, that we have not been able to add one new type to his list.

We now turn to the two gold coins of the *Mánikyála* cabinet, having, from the above cursory survey of the more numerous copper coins, become possessed as it were of a key to their solution.

It was some little time before I discovered that the inscriptions on the larger gold coin of the first *Mánikyála* deposit, (Plate XXI. fig. 2,) and the little gold coin of the lower cylinder (Plate XXII. fig. 24,) bore precisely the same legend on the obverse. The first half of the writing on the small coin was not legible; and it was only after perceiving the analogy of the latter half, with the second part of the larger coin, that I was led by careful examination, to trace and recognize the rudiments of each letter of the first part of the obliterated coin. I have in the present Plate, XXV., placed the two in juxtaposition, (figs. 25 and 26,) to shew their identity, and the whole line thus restored becomes very evidently

\* See the drawing of this coin by MASSON, in Plate XIII.

PAO NANO PAO .. OOHPKI KOPANO.

There is some indistinctness, and perhaps an omission, about the central portion of this inscription, where portions of the letters are cut off, or entangled with the ornamental head-dress of the prince; but we are fortunately able to clear up this uncertainty from a coin depicted as No. 2 of Professor WILSON'S plates, in the seventeenth volume of the Researches, and stated by my predecessor to have been discovered in a field near Conailla in Tipera. The inscription on this coin, of which the fac simile in type metal, cut for the Researches, is fortunately in my possession, is now rendered legible by our acquired knowledge of its associates; I here place the corrected reading under the fac simile :

ΠΑΟΝΑΝΟΠΑΟΚΑ ΝΗΡΚΙΚΟΠΑΝΟ

P A O N A N O P A O K A N H P K I K O P A N O

and it at once enables us to supply the omission in the centre of the Mánikyála gold coins by the name already so familiar to our ears, as *Kanerki* or *Kanerkou*.

Are these various coins then all the production of one sovereign, or was the superscription of that prince maintained by his successors, and gradually lost by the corruption of the Greek characters, in which it was endeavoured to be conveyed? To these questions a satisfactory answer cannot be given in the present state of our knowledge: but we cannot avoid remarking that the . . KENOPANO of the elephant coin may, by a very trifling alteration, be read as . . . . . KI KOPANO, which will bring it to coincide with the other coins of this extensive family.

The degeneration of individual letters is sufficiently visible in the various forms of the P, the A, the K, and the M, in the specimens engraved, but a more wholesale abandonment of the primitive form may, I think, be pointed out in the third gold coin of Mr. WILSON'S plates, being one of what we have called the bull and raja, or Kadphises, coins. The legend on this is very prominent, and contains, under a trifling disguise, the very letters of the same sentence; the first letter P is wanting, and the three final letters of the last word

*Fac simile,*

ΑΟΝΑΝΟΠΑΟ ΟΟΗΟΚΟΡ

*Corrected reading, (ρ) A O N A N O P A O O O H O K O P (avo)*

The collection received from KERAMAT ALI has put me in possession of two gold coins of this curious species; (which was indeed held to be of doubtful origin, from Colonel MACKENZIE having apparently multiplied fac similes of his in silver;) they are thin, and of exceedingly clumsy manufacture, but the legends in both are plain, though much more transformed than the specimen just given. Fig. 10 of Plate XXVI represents one of these coins, and fig. 11, the principal characteristics of the other, namely, the inscription, the king's head, (already alluded



to as wearing the winged cap of the Sassanian monarchs,) the fire-altar, and the symbol, all more or less varied. The inscription now possesses but three characters, P, N, and O, the latter having swallowed up all the angular A's and P's ; and the N assuming all the functions of M and K. Bearing this in mind, the lower line may be read without any fanciful straining, O PAONANO P . O KOPA...

Fig. 10 is equally capable of the same interpretation, for beginning on the left hand, at the bottom, what appears to be

POOHOPOOBO UOVO VOPOHO

is evidently letter for letter a corruption of

PAONANOPAO OOHOKOPANO

The *letter* of the whole series of these curious relics of a dynasty entirely unknown from other sources having been so far developed, as regards the obverse of the medals, it remains, before we proceed to consider the variable motto on the reverse, to offer a few observations on the *meaning* these enigmatical words *rao nano rao* and *korano* may be intended to convey.

First then, as regards the termination in the short Greek O ;—we learn from M. EUGENE BURNOUF's very learned commentary on the *Yaçna*, in the introductory essay on the Zend alphabet, that the latter contains a short *o* unknown to the Sanscrit alphabet and used as the equivalent of the short Nágari inherent *a*, while on the other hand it has precisely the value of the Greek omicron\*. To express therefore any native word, so terminating, in the Greek character, the omicron would necessarily be employed. We know from the circumstance of the Zend or rather Pehlevi characters on the obverse of the Bactrian coins, that this dialect must have been the prevailing language of the country. Moreover from the learned authority above quoted we learn, that the termination in *do* is of very frequent use in the Zend, the final *o* being the regular permutation of *s*, the sign of the Sanscrit nominative in words common to the two languages : thus in *ahura-mazdao* (ormuzd), the latter word is precisely the Sanscrit *mahá-dás* ' qui magna dat,' an attribute of the

\* It is unnecessary to state that in the Zend as in the European alphabets, the vowels are all expressed by distinguishing symbols. M. BURNOUF in speaking of a change of vowel orthography between the Sanscrit and Zend says ; " Ce changement devra peu étonner sans doute, si l'on pense que dans l'Inde même l'*a* bref Dévanágari vaut *o* suivant la prononciation Bengálie, et *e* bref comme nous l'avons déjà remarqué plus haut. Dans ce cas l'*ó* Zend n'est pas en réalité l'*ó* Dévanágari c'est plutôt l'*omicron* grec, en tant qu'il repond à l'*a* Sanscrit et à l'*e* Latin dans les mots que ces trois langues possèdent en commun."—*Commentaire sur le Yaçna par Eugene Burnouf, vol. I. p. 59.*

deity : again “ la lune porte en Zend le nom de *máo* : et *máhya*, lunaire, avec le suffixe des adjectifs *ya* est derivé de *máh*, qui est exactement le Sanscrit *mas*, (lune).”

The reiteration of the term *ráo* in the expression *rao náno rao*, contrasted with its single employment in other instances, bears so strong an affinity to the duplication *βασιλευς βασιλεων*, in Greek ; *malkan-malká*, in Pehlevi ; *rájádhi-rája*, in Sanscrit, &c. that it is hardly possible to resist the assumption of a similar interpretation for the words in question, more especially when it is known that the term *rao* is to this day a common affix to the names of native Marhatta and Rajpút princes ; such as MULHAR RAO, GOVIND RAO, TRIMBAK RAO, &c. The Persian title *ráy*, conferred by the Delhí emperors on Hindu princes as an inferior grade to *rájá*, had doubtless a similar meaning, and like *rex*, *ré*, *roi*, may be all traced to the original Sanscrit root *रज*, the quality of rule or passion (both equal privileges of royalty !)

The title *Bala-ráya*, or *Bala-rao*, is stated by WILFORD to have been equivalent in the spoken language of Gujerat, to *Bala-rája*, ‘ the great king.’ The *Bala-ráya* dynasty of that country was composed of petty kings, and the title was contra-distinguished from *Rájéndra* the superior or imperial sovereign\*. Mr. WILSON in his notes on the ancient inscriptions on Mount Abu† enumerates the following titles as denoting progressively decreasing grades of rank ;—*mahárájádhirája*, *rája*, *rána*, *ráwel*, *rási*, and *ráo*. The appellation *rawel*, according to Col. TOD‡, was the ancient title of the princes of Mewár. It was only changed to *rána* in the twelfth century. *Raoul* or *rawel* is still the designation of the princes of *Dungurpur* and *Jesalmír*.

That *rao* was an inferior title will not injure its applicability to the princes of the Panjáb and Bactria, at the time in question, for it is known that the country was divided into petty sovereignties, and it is probable that many were tributary to the Persian monarch.

Without a dictionary of the Zend, the right interpretation of the word *nána* can only be attempted in the same hypothetical manner : as a name it is frequently met with among the Parsís of the west of India, and equally among the Marhattas of Guzerát and the Dakhan ; NANA GOVIND RAO, NANA COWASJEE, NANA FARNAVÍZ, the Púna minister, and many other familiar names might be adduced in evidence. That it is some title of nobilitude (if I may use the expression) can hardly be doubted, though its precise import be not known : the word *Nána*

\* Asiatic Researches, vol. ix. p. 179.

† Asiatic Researches, vol. xvi. p. 314.

‡ Tod’s Rájasthán, vol. i. p. 213.

is inserted in WILSON'S Sanscrit dictionary as bearing the signification, ' without, except ; ' many, various ; ' double, or two-fold, as *nánárasa*, many-flavoured ; *nánárúgá*, many-coloured :—in the same way we might read, knowing the close connection of the Zend with the Sanscrit, *ráo nána ráo* ' royal doubly royal ; ' which has so far a strict analogy with *rájádhi raja—rex-super-rex*. I am unable to offer any more probable conjecture on the meaning of this word.

The final designation *korano*, bears at first sight a strong resemblance to the Greek *καρπας*, princeps, dominus : but as the introduction of a word, seldom or never used in this sense upon coins, would imply an increasing knowledge of a foreign tongue at the very time when in other palpable instances it was falling into disuse and oblivion, such an explanation cannot be allowed for a moment. The next analogy which strikes the imagination is, to the modern title *sáhib-i-qirán*, borne by three of the Delhí monarchs, TIMUR, SHAH JEHAN and MUHAMMED SHAH. The explanation of this epithet has been given in various ways, as " lord of the fortunate conjunction of the planets ; " " the august hero ; " " the sovereign who has reigned through a certain term or lustrum," (10, 20, 30, 40, 80, or 120 years,) " lord of the horns or rays." In the latter sense it bears an analogy to *zá-l-karnáin*, the common title of ALEXANDER the Great, literally " *aux cornes*," with the horns, in allusion to the horns of Ammon depicted upon his head in most of his medals. Here again is a connection not to be passed over unobserved with the application of *zá-l-aknáf*, " *aux ailes*," to the parallel instance of the winged head-dress of SAPOR in the Sassanian coin before described.

*Kirana* is Sanscrit as well as Persian : no doubt therefore some derivative form of the same root will be found in the Zend : it signifies a ray of light, a sun or moon beam : *karana* also signifies an interval of time. It is probable therefore that the epithet *koráno* may have some reference to the designation of the Moghul emperors, who, it may be remarked, brought it into Hindustán, though many centuries afterwards, from the country which was the scene of KANERKI'S rule.

Of the word preceding *koráno*, the variations in reading on different coins are so great, OOH, OOMO, OMKO, &c. that I cannot venture an opinion on the subject further than, as it appears also in the pure Greek inscription of KADPHISES' coin, it must probably form part of a proper name. On the two Mánikyála gold coins however, the reading is distinctly OOMPKI (or OOHPKI, for the H and M are nearly alike), while on CAREY'S coin before described the initial is equally distinct, and the testimony is strong in favor of reading it as KANHPKI, with the same termination as is found on the well-preserved coin fig. 10, of Plate XXV.

Should this prove to be the right reading, we have thus the full inscription on the obverse PAO NANO PAO KANHPKI KOPANO, which may be interpreted "king of kings, *Kanerki* the splendid."

I have not alluded to the hypothesis advanced in my former note, that KANERKOS might be the Canishka of Cashmirian history, because the discovery of the Sassanian coins, and the consequent modern date of the present monument, at once overthrow that supposition. It may however be urged in explanation of the great abundance of the *Kanerki* coins, that this name may be one of a family, or dynasty, like that of *Arsaces*, on the Arsacidan coins, repeated without further distinction than an alteration in the features and dress of the monarch, throughout the whole line from the real *Kanerki* downwards.

*Inscription on the reverse of the Kanerki coins.*


I now proceed to offer a few remarks touching the inscription and device on the reverse of the Manikyála coins of the Kanerki group.

That the image represented on all these coins is a sacred personage may be gathered from the glory which invariably encircles its head. In this respect they resemble their Grecian prototypes, upon which we behold the figures of Jupiter, Hercules, Apollo, and Castor and Pollux.

The costume of our mythological figure however, differs greatly from the Grecian model, and in the specimens best preserved, as fig. 10, of Plate XXV., it resembles the Persian dress with its peculiar turbaned hat, and a thin flowing robe hanging from the shoulders.

There are four varieties of attitude, attended with other peculiarities, which it will be better to couple in description with what we have to say on the epigraphe of each.

The first variety is already well known from Lieut. BURNES' and MASSON'S specimens: a beautiful coin of this type is engraved in Plate XXV. from one of KERÁMAT ALI'S collection.

The figure is wrapped in a flowing muslin robe, of the Indian character: it faces the right hand; it is apparently a female, and it bears a lotus. The motto is, NANAIA. Portions of the same name are seen on all of the copper coins in which the figure faces to the right hand: It is also discoverable in the Tipera gold coin (No. 2, of WILSON'S plates) already alluded to, in the before inexplicable fragment , the first mark of which is part of the device and not a letter: the next three letters are evidently NAN..

Mr. MASSON has conjectured very plausibly, that this name is identical with *Náni*. There are he says, numerous shrines throughout that country known to the Muhammedans as the *zeárats* of *Bíbi Náni*. The Hindus also resort to them, claiming the lady as one of the numerous forms of the goddess *Párbatí*.

Colonel WILFORD mentions in the third and fourth volumes of the *Resarches* a goddess called by STRABO, ANAIA and equivalent to the Sanscrit *anáyasá dévī*, which seems to have a near connection with the object of discussion. "Even to this day," says this learned mythologist, "the Hindus occasionally visit the two *jwálá-mukhís* or the burning springs (of naphtha) in *Cusha-dwipa* within: the first of which dedicated to the goddess Dévī with the epithet *anáyasá* is not far from the Tigris; and STRABO mentions a temple on that very spot, inscribed to the goddess *Anaias*:" again, "*anáyasá-dévi-sthán* (now Corcur) was the *της Αναίας Ιερου* of STRABO\*."

He afterwards alludes to some Hindus who had visited the place: "I have been fortunate enough to meet with four or five pilgrims of India who had paid their devotions at this holy temple of the goddess ANAIA or ANAIAS, with its burning mouth or *jwálá-mukhí*: it is near Kerkook, east of the Tigris†."

The circumstance of the burning fountain is of material importance, as it will be seen by the sequel that it connects *nanaia* with the other devices of the reverse, and with the general and national fire worship to which it is imagined they may all be traced. The inscriptions accompanying this appellation are generally speaking of pure Greek; had they been otherwise, it might have been doubted whether *nanaia* were not the adjectival or feminine form of the word *nána* on the obverse.

The goddess *Nanaia*, or *Anaia*, again bears a close analogy in name and character to the *Anaïtis* of the Greek, and *Anahid* of the Persian, mythology; that is, the planet Venus, and one of the *seven fires* held sacred by the latter people. M. GUIGNIAUT's remarks on the subject may be applied to the figure on our coin:—"Le culte simple et pur du feu, dominant dans les premiers âges, se vit bientôt associer le culte des astres et surtout des planètes. . . . Les feux, les planètes, et les génies qui y président sont au nombre de sept, nombre le plus sacré de tous chez les Perses; mais trois surtout se représentent sans cesse comme les plus anciennement révéérés, le feu des étoiles ou la planète de Vénus, *Anahid*; le feu du soleil, ou feu *Mihr*; le feu de la foudre, ou feu *Bersin*, Jupiter. Le culte du feu *Guschasp* ou d' *Anahid* figure comme un culte fort antique dans les livres Zends et dans le *Schah Nameh*, de même que celui d' *Anaïtis* dans une foule d'auteurs Grecs depuis Hérodote. . . . Or *Mitrá* (féminin de *Mithras*) et *Anahid* ou *Anaitis* sont une seule et même déesse, l'étoile du matin, génie femelle qui préside à l'amour, qui donne la lumière, et qui dirige la marche harmonieuse

\* *As. Res.* vol. iii. p. 297 and 434. † *As. Res.* vol. iv. p. 374.

des astres avec les sons de sa lyre dont les rayons du soleil forment les cordes\*.”

The object in the hand of our *Nanaia*, fig. 7, Plate XXV., is not however a musical instrument, but rather a flower, or perhaps the mirror appertaining to Venus.

The larger gold coin from Manikyála has apparently an expanded form of the same name: it is read MANAOBAFO in page 316, but from the similarity of M and N in the corrupted Greek of the period in question, I entertain little doubt that the correct reading is NANAIO (for *ναναία*), with some affix or epithet BA or BAFO or BAAO, which could only be made out by one acquainted with the Zend language.

On the other hand the horns of the moon projecting from the shoulders of this figure, assimilate it strongly to a drawing in HYDE'S *Rel. Vet. Pers.* p. 114, of *Malach-baal*, to which also the last four letters of the inscription bears some resemblance. *Malach-baal* or *rex-baal* is only another name for the sun. Those who incline to the latter interpretation will of course class this reverse with those of ΗΑΙΟC, to which I shall presently advert.

A remarkable variation from the genuine Greek reading occurs in one of the specimens published by Colonel FOD in the *Transactions Roy. As. Soc.* vol. i. plate xii. fig. 14, on a coin of PAO KA . . . . (*νηρκι*). The word *nanaia* here appears under the disguise of NANAIO, and this is an important accession to our knowledge, both as shewing that the Greek name corresponded to the vernacular, and as proving from the Zend termination in *áo* the link with the Sanscrit *anáyasa*.

The second type of the Kanerkou reverse represents a male figure, dressed in a frock, trowsers, and boots: he is in a graceful attitude, facing the left, with the right arm uplifted and the left a-kimbo. He has a turban and a glory, which is in some instances radiated.

The designation on the higher class of this type is uniformly ΗΑΙΟC the sun, and there can be no doubt therefore concerning its nature: moreover in the subsequent series, wherein the Greek language is suspended and the letters only retained, a corresponding change is observed in the title, while the same dress of the 'regent of the sun' is preserved, and enables us to identify him.

The Romans and Greeks, as we learn from HYDE, always dressed Mithra in the costume of a Persian king: thus on various sculptures inscribed *Deo Mithra Persarum*, "visitur MITHRA seu Sol, figurâ humanâ Regis Persici qui subijit taurum eumque calcat necatque†." This very

\* Religions de l'Antiquité du Dr. CREUZER, par GUIGNIAUT, ii. 731.

† *Historia Religionis veterum Persarum*, 112.—The expression of Lucian's *in Deorum Consilio*, is also thus rendered by GUIGNIAUT:—"Ce Mithras qui vêtu de

common attribute of MITHRA slaying the bull, which is supposed to typify the power of the sun subjecting the earth to the purposes of agriculture and vegetation, might lead to the conjecture that the figure on the reverse of the Kadphises coin was also MITHRA with his bull; the dress however is different: neither is there any appearance of a sacrifice; the reading of the Zend inscription can alone clear up this difficulty, and I will in a future plate collate all the inscriptions which are sufficiently legible for the examination of the Secretary of the Paris As. Soc., whose researches in this language point him out as the most competent scholar to undertake the solution of the problem.

In Plate XXV. (figs. 12 to 24). I have engraved such of the substitutes for ΗΑΙΟC as are most distinct in my cabinet, beginning with the well developed characters of fig. 10. It requires no stretch of imagination to discover in the first six of these, the word ΜΙΟΡΑ, written ΜΙΘΡΟ or ΜΙΟΡΟ, according to the Zend pronunciation, *Mihira* being the Sanscrit and Persian name for the sun.

Thus when the reformation of the mint nomenclature was effected, by the discontinuance of Greek appellations, we perceive that the vernacular words were simultaneously introduced on both sides of the coin; and the fortunate discovery of two coincident terms so familiar as *helios* and *mihira* or *mithra*, adds corroboration to the identity of the titles of the monarch on the obverse, and his names, Kanerki and Kanerkou.

The number of coins on which ΜΙΟΡΟ appears is very great: it always accompanies the ΡΑΟ ΚΑ . . . ΝΙΡΚΙ form: see Colonel Tod's plate in the Royal Asiatic Society's Transactions, vol. i. plate xii. fig. 11, in the 3rd series: also figure 12, which belongs to the sitting-figure type. It is frequently found also on the elephant coin, see fig. 12, of Tod: and fig. 31, of WILSON (Asiatic Researches xvii.) Figure 33, of my own Plate XXV. is a small copper coin from the Μάνικυάλα tope in which it is also recognizable. I find it likewise on several of the sitting-figure coins, figs. 29 and 32, of Plate XXII: but what is of more consequence in our examination of the Μάνικυάλα relics, it is discernible on the reverse of the small gold coin (Plate XXII. fig. 24,) although I did not recognise the individual letters when I penned the description of it in page 319.

As we proceed down lower in the list in Plate XXV. the purity of expression is altogether lost, and the word ΜΙΟΡΟ degenerates into ΜΑΟ or ΗΑΟ, and ΜΑ or ΗΑ, for the Μ and Η are with difficulty distin-

la candys et paré de la tiare, ne sait pas dire un mot de Grec au banquet de l'Olympe, et n'a pas même l'air de comprendre que l'on boit le nectar à sa santé."—*Rel. de l'Ant.* 738.

guished. Many of the coins, containing this form of the word, are complete, and seem to have borne no other letters. We might almost be tempted to discover in this expression another cognomen of the Sun or of Bacchus, IAO and IA, about which so much discussion appears in the works of the Fathers, on the Manichean heresy and the doctrines of the magi, in the third century\*. The Greek mode of writing the word, to be sure, is different, but the pronunciation will be nearly alike, and as the word was of barbaric origin, (being taken from the Hebrew *Iaho* or *Jehovah*,) some latitude of orthography might be expected in places so distant. This is however but a vague hypothesis to account for the presence of a name in connection with a figure, which is known from its identity with the ΗΑΙΟC type of figure 8, to represent that deity. A multitude of symbols and names, under which the sun was worshipped or typified at the time that the Christian doctrines were spreading, and the old religions as it were breaking up and amalgamating in new groupes, will be found enumerated in the learned work of BEAUSOBRE. The engraved stones, amulets, and talismans ascribed to the Gnostics and the followers of BASILIDES, &c. bear the names of *Iao*, *Adonai*, *Sabaoth*, and *Abraxas*, all of which this author traces to divers attributes of the sun. But it is impossible to pursue the subject into the endless labyrinth of cabalistic mythology in which it is involved:—That the image on our coins represents the sun or his priest is all I aim to prove.

There are two other forms of the inscription on this series that it is more difficult to explain: many of the coins with the elephant obverse have very legibly the whole, or a part, of a word ending in ΑΘΡΟ; in some it is as clearly ΜΑΘΡΟ.

Now, although both these words may be merely ignorant corruptions of the original form *Mithra*, it is as well to state that they are both independently pure Zend words, and capable of interpretation, albeit more or less strained and unnatural, as epithets or mythological attributes of the sun, or as we may conjecture, through that resplendent image, of Zoroaster the son and manifest effulgence of the deity.

\* “ Il faut convenir aussi qu’*Iao* est un des noms que les Payens donnoient au Soleil. J’ai rapporté l’oracle d’*Apollon* de *Clarus*, dans lequel *Pluton*, *Jupiter*, le *Soleil* et *Iao* se partagent les saisons. Ces quatre divinités sont au fond la même: *Eis Zeus*, *eis Adης*, *eis Ηλιος*, *eis Διονυσος*. C’est à dire “ *Jupiter*, *Pluton*, le *Soleil* et *Bacchus* sont la même chose. Celui que est nommé *Dionysus* dans ce dernier vers est le même qui est nommé *Iao* dans l’oracle. *Macrobius* rapporté un autre oracle d’*Apollon*, qui est conçu en ces termes: φράζω τὸν παντῶν υπατον θεὸν ἔμμεν Ἰδω ‘ je vous declare qu’*Iao* est le plus grand des dieux.’ *Macrobe* bien instruit de la *Theologie Payenne*, assure que *Iao* est le *Soleil*.”—*Histoire de Manichée par De Beausobre*, tom. ii. p. 60.



Thus in the last number of the *Journal Asiatique*, in a learned essay on the origin of the word Africa, the Zend word *athro* is quoted as equivalent to the Greek *αἶθηρ*, the pure subtle spirit or region of fire, or of the sun, very imperfectly expressed by our derivate *ether*.

Of the word *Máthra*, or *MAΘΡΟ*, we find a lucid explanation in M. BURNOUR's commentary on the *Yaçna*, a part of the *vendidad-sadè*. In the passage where he analyzes the Zend compound *tanumáthrahé*, 'corps de la parole,' *mathra* is thus shewn to be the equivalent of the Sanscrit word *mantra* :—

“ Il faut reconnaître que cet adjectif est un composé possessif, et traduire : ‘ celui qui a la parole pour corps, celui dont la parole est le corps ;’ et peut-être par extension : ‘ parole faite corps, incarnée.’ Cette interprétation ne saurait être douteuse ; car le sens de *tanu* est bien fixé en Zend, c’est le Sanscrit *tanu*, et le Persian *تن* (corps) ; et celui de *máthra* n’est pas moins certain, puisque ce mot Zend ne diffère de Sanscrit *mantra* que par l’adoption de l’*ā* qui aime à précéder *th* et les sifflantes, et par l’aspiration du *t* laquelle résulte de la rencontre de la dentale et de la liquide *r*.”

‘ La parole’ is explained by M. BURNOUR to signify ‘ la parole d’Ormuzd,’ the word of God, or incarnation of the divinity. A title frequently used in the *Zendavesta*, to designate Zoroaster (*Zarathrusta*).

Thus I have endeavoured to prove, that all of this class of figures refer to the sun, under his various names and attributes :—the only exception I can adduce is in figure 11 of Plate XXV. exhibiting the reverse of a copper Kanerki coin, in very good preservation. The context of its long inscription has hitherto baffled my attempts at decyphering ; but I am inclined to class it along with the *NANAIA* reverses.

Under the risk of being tedious, I have now gone through the whole series of corrupted Greek coins connected with the *Mánikyála tope*, and I trust that the result of my investigation will serve to throw some new light on the subject. I have ventured to give the appellation of “ Mithriac” to the very numerous coins which have been proved to bear the effigy of the sun, for they afford the strongest evidence of the extension of the religion of ZOROASTER in some parts of Bactria and the Panjáb at the time of its re-assumption of consequence in Persia ; while the appearance of Krishna on the field at the same time proves the effort that was then afloat, as testified by the works of the Christians, to blend the mysteries of magísm with the current religions of the day. I cannot conclude this branch of the *Mánikyála* investigation better than in the following extract from Moor’s *Hindú Pantheon* : “ So grand a symbol of the deity as the sun ‘ looking from his

sole dominion like the God of this world,' which to ignorant people must be his most glorious and natural type, will of course have attracted the earliest adoration, and where revelation was withheld, will almost necessarily have been the primary fount of idolatry and superstition. The investigators of ancient mythology accordingly trace to this prolific source, wherein they are melted and lost, almost every other mythological personage; who, like his own light, diverge and radiate from his most glorious centre."

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*Postscript on the image of Buddha from Kábul.*

The Bauddha image represented in figure 1 of Plate XXVI. is described in the Proceedings of the Asiatic Society, of the 6th August last, page 363.

It was discovered by Doctor GERARD in the course of some excavations made by him in the ruins of an ancient town about two miles south-east of Kábul, and near a modern village called *Béni hissár*.

According to the description given by MOHAN LÁL, the image was not found in an insulated tope, but in a mass of bricks and rubbish, which more resembled the ordinary ruins of a desolated town. After penetrating through a mound of such debris, a chamber of masonry was by accident found in entire preservation, the walls of which were ornamented with coloured stones and gilding; and here the statue was discovered. It was evidently the ruin of some Bauddha temple, or oratory in a private dwelling, that had been deserted on the demolition of the town. The image itself has been partially mutilated, as if in a hurried manner, by striking off the heads of the figures with a hammer; one only has escaped: the principal figure has lost the upper part of the head. This mode of desecration points to an irruption of Muhammedans in their first zeal for the destruction of graven idols. The faces at Bamián are described by Lieut. BURNES to have been mutilated in a similar way, while the rest of the figures remain tolerably perfect. The town was probably plundered and destroyed; such of the Buddhist inhabitants as escaped, taking refuge in the neighbouring hills, or in Tibet, where the religion of Buddha continued to flourish. The age of the image, if this conjecture be well founded, will be about ten centuries, falling far short of the antiquity of the topes themselves, and having no immediate connection with them, unless as proving the continued prevalence of the Bauddha doctrines in Kábul to the latter period, a fact well known from other sources.

The lambent flame on the shoulders is a peculiarity not observed in any image or drawing of Buddha that I have seen. It seems to denote a Mithriac tinge in the local faith. The solar disc or glory behind the

figure is a common appendage to sacred persons in every creed; and the angels above, as well as the groupes on either side, are of frequent occurrence.

IV.—*Journal of a Tour through Georgia, Persia, and Mesopotamia.* By  
Capt. R. MIGNAN, *Bombay Eur. Reg. F. L. S. and M. R. A. S.*

[Continued from p. 339.]

It was a fine morning when we quitted our encampment *en grande tenue* to descend to the shores of the Araxes. On reaching its banks, we found its width about three hundred and fifty feet, and we crossed it by a stone bridge of fifteen arches in a very dilapidated state. The vestiges of a second stood a short way up the river, and in its ruined condition presented one of the most deserted scenes that could be imagined. A little to the eastward lies the extensive plain of Mogaum, which during summer is rendered nearly impassable from the innumerable heaps of snakes which cover its surface. I saw several of their cast skins, which resembled the *Cobra di capello*. This sufficiently establishes the account given by Plutarch of POMPEY the Great, who after having overcome the Albanians wished to follow the enemy to the shores of the Caspian, but was reluctantly obliged to abandon his design in consequence of the snakes which occupied the intervening plain. GIBBON doubts the account of the existence of venomous reptiles in this country as related by PLINY.—(GIBBON'S Roman Empire, vol. iv. chap. 46, note 5).

On leaving the Araxes, or according to the present appellation, the Arras, the country assumes a wild aspect. It consists generally of high mountains, divided by narrow valleys, or plains environed by elevated hills, accessible only by narrow passes and defiles. Hence, it is one of the strongest countries in the world, and its inhabitants have always preserved a partial independence. They have been often defeated, but never subdued; and although tributary to ABBAS MIRZA, the Governor of Azerbijân, are in general free. In fact the country is almost impracticable, and of very easy defence. Having traversed a narrow plain on the river's border of about three miles in extent, we arrived at the foot of a steep bank, which we ascended, and travelled on a farsang, or four miles further in a direction S. S. E, when we gladly saw the village of Khomorlu, situated upon a deep ravine, between steep calcareous and barren mountains. The inhabitants, who dwell in wretched hovels scooped in the ground, are notorious plunderers and assassins; but excuse their own depredations from a conviction

that the whole world are their enemies. These villagers appeared the poorest I had yet seen. Both sexes were clad in rags, and the children to the age of seven or eight were invariably naked. They appeared to me to possess neither food nor furniture beyond the milk of a few sheep and goats, and a scanty supply of grapes, which in the summer season grow on vines that spring up between the clefts of the rocks. I ascended a lofty eminence behind the village, which commanded an admirable view of the Araxes. No outlet for the stream appeared in any one direction, the curves of the river's banks enclosing the opposite points gave it the appearance of a lake completely 'land-locked;' while detached rocks rising at a distance in a pyramidal form gave an increased magnificence to the scene.

Quitting these poor borderers, who were ground and crushed by Prince KHOSROU like corn between the upper and nether mill-stones, we proceeded in an easterly direction, and crossed the bed of a river, or rather mountain-torrent, in which the actual stream of water when we passed was not above four yards in breadth, though the channel itself was at least forty. It falls into the Araxes about ten miles eastward of the bridge, in a direction north and south. We travelled to a village called Molaun, distant about seventeen miles from Khomorlu. The general direction of the road was south by east. The country was singularly wild; indeed, our road lay over a succession of mountains, which stretched in continual lines as far as the view extended. No soil covered the rocks, no verdure enlivened them; a few bushes of the melancholy wild cypress, and some stunted oaks, comprised the whole of the vegetable world at this season. The approach to the village was both difficult and dangerous. From this the direction of our road varied from S. E. by S. to S. S. E. a distance of three farsangs, or twelve miles, to the hamlet of Ruswár, standing in a scene as desolate, and in a valley as gloomy, as can well be imagined. Not even a tree marks the course of a stream that gives water to the inhabitants. All bespeaks misery and mistrust, as the neighbouring hills are haunted by a number of predatory tribes. My host, whose poverty was perhaps his greatest crime, had on the preceding evening lost his only daughter. The robbers had stolen her in lieu of tribute! At this place we certainly had an opportunity of observing the extreme misery of the peasantry, who in addition to heavy taxes, by which they were already oppressed, were subject to such perpetual depredation from free-booters, that those who were not already ruined by contribution and pillage, found it prudent to present an appearance of the most abject wretchedness as their only security against further exactions.

The road continued over an uninterrupted succession of mountains, and was almost impassable for loaded cattle. We continued ascending until mid-day, when on arriving at the summit of the highest range of hills, a most beautiful scene suddenly and unexpectedly burst upon the view. The prospect was rendered doubly interesting from our having so long traversed a barren waste. The sloping sides of the mountains were thickly studded with the stunted oak. From this point, on looking back, the eye reposed upon successive ranges of mountainous ridges, which gradually decreased in height until they marked the more level country on the banks of the Araxes. Upon the extreme and broken line of the horizon, the lofty hills of the fruitful province of Kárabágh arose in towering grandeur; while immense piles of rock in the foreground, appearing as if thrown up from the very bowels of the earth by some great convulsion of nature, completed the sublimity of the scene. The general direction of these ranges seemed nearly east and west, and they might extend from two hundred and fifty to three hundred miles. Their outlines in Káradágh were more even, and their summits less elevated than those of Kárabágh, as we saw no snow on the former, whereas the latter presented most extensive patches of the purest white. The northern sides of both these ranges might, however, be more thickly covered with snow, from their being less exposed to the dissolving influence of the sun. The great eastern plain of Mogaum presented an horizon like the sea, broken only by small eminences, arising like cliffs and islets out of the water.

We still continued to ascend some barren hills, and felt the weather excessively keen. The thermometer by dawn of day (February 19th) sunk to 28°. Our beards were frozen, and the nostrils of the baggage horses completely choked up with ice-balls, which made it necessary to halt frequently and rub them off. We suffered most severely from thirst and the dazzling reflection of the sun's rays upon the snow, which tanned our faces to such a degree, that we could not wash without suffering extreme pain. It was noon when we reached a small village called Dombry, where we were served with *lubbun*, or curdled sour milk. The elevation of this place above the level of the sea must exceed five thousand feet, for the boiling point on a thermometer of large dimensions varied from 207° to 203°, which, allowing five hundred feet to each degree, gives an elevation of from two thousand five hundred, to four thousand five hundred feet. In three hours from Dombry we descended the rugged mountains which bound the northern side of the plain of Ahar. These ranges appear to be a branch of Mount Caucasus, which bound the territories of Irivan and Nacjiwan,

and here take an easterly direction. To the south of us, about three miles, were seen a few trees on the brow of a hill. These surrounded the town of Ahar, and were now become remarkable objects; for since leaving the shores of the Araxes, with the exception of a few hilly tracts in the hamlet of Ruswar, we had scarcely seen a tree throughout our track. This general bareness of wood gives a very forbidding and melancholy aspect to a country, however productive it may be in other respects. A lover of the picturesque would soon become tired of this monotonous appearance. We descended across the plain of Ahar for nearly an hour, and opened a full view of the Ahar river winding in its course to the westward. Still descending, and going nearly south, over deep snow, we came near the water's edge. There was here a ruined building with a domed top, and some arches in its walls; it was perhaps an old well, as the tombs of the Mohammedans are often enclosed. We went from hence to the westward along the northern bank of the stream, over a flat shelving land, when we came immediately opposite to Ahar, which stands on the southern side of the river.

We found no difficulty in crossing, as the river's greatest depth did not appear to be more than five feet. Its waters were extremely turbid, more so than those of the Kur, and much inferior to them in taste. The town of Ahar is the capital of Karadaugh, or the "Black Mountain," as the whole district is designated. It would appear to be the Hara of antiquity, one of the three cities mentioned in 1 Chron. ch. v. 26 ver., to which the Reubenites, the Gadites, and the half tribe of Manasseh, were carried away by Pul, King of Assyria, and TILGATH-PILNESER, King of Assyria. The letters in Hara exist also in Ahar, and a transposition of syllables, or letters having the same sound, is very common in the east. Its relative position with Khalcal, and Abhar would also favour the conjecture. The river runs nearly east and west, and is extremely narrow, infinitely more so than the Araxes. It undergoes a variation in its height during the year, but this is irregular, as there are no periodical rains; and if in spring these give an increase of waters to the tributary streams, the melting of the snows on Mount Savalan, in the autumn, contribute an equal portion.

Ahar contains about six hundred houses, and from five to six thousand inhabitants. It has four mosques, a public bath, a spacious caravansary, and a good bazar. Its streets are narrow, but apparently clean, and some of its houses are plastered with Persian inscriptions, bearing the date of their erection. On the southern side of the town, upon an elevated spot, stands the tomb of Sheikh SAAB-UL-DEEN, the teacher of Sheikh SEFFI, the founder of the family of Seffeviah, better

known in Europe as the Sophis. The mausoleum is of brick, with a foundation of stone, and faced by a portico flanked by two pillars encrusted with green tiles. The whole forms a decoration to the town, and is in good taste. This place is under the dominion of H. R. H. Prince ABBAS MIRZA, and is governed by his eldest son MOHAMMED MIRZA, who has only a few personal attendants, and no soldiers whatever, although the town is supposed to be fortified and of great strength. The reception given to KHOSRO MIRZA, by his elder brother, was like that of a slave to his master, and the manner in which this "sprig of nobility" treated his entertainer in return, was quite *à la Persienne*; or, in other words, as much in the spirit of the despotic Shah whom he served. The quarters which were provided for us were sumptuous and elegant when compared with those of the villages through which we had passed before, and our several entertainers vied with each other in proffering their choicest collations. We were lodged in the house of a lively and intelligent Persian, who was the governor's *ferosh bashee*. He was most anxious to know how his countrymen had behaved during their late mission, and on my assuring him that they all got dead drunk every night of their lives, he exclaimed, "Would to God Prince KHOSRO had permitted me to accompany him, what delights I have lost! In your company I might have committed any excesses with impunity!" I told him that the debauchees in the metropolis of my own country would have stood no chance with the young Prince, and as to his proceedings since we had crossed the Araxes, such as sheep-stealing and village-plundering: these were little foibles done in so gentlemanly a manner that they gave *eclat* to his pedigree. My host remarked with a laugh, that such proceedings were the inevitable consequences of his calling, and that all his family, including the old Shah himself, had practised them before. He seemed to think that the axiom "*Il faut vivre*" was a very compulsory one in Persia. "And what has the Prince Royal been doing lately?" I asked: "has he been performing the same sort of achievements?" "Even so," he replied, "His Highness is gathering in his due to pay the troops." "You mean," I rejoined, "for the support of his haram, a prosperous harvest to him." "God's will be done," continued my friend, "a few hundred men can do any thing." In this, however, he was mistaken, for the "few hundred men," we afterwards heard, were attacked by a superior force from the hills, and most of the "posse comitatus" laid on the field! So much for Persian finance. It is even worse than rent-collecting in Ireland.

The height of the town of Ahar above the sea, as estimated by the temperature at which water boils (205½° of Fahrenheit) may approach.

to 3,300 feet. LESLIE'S hygrometer only fell to 30°, which may be attributed to the moisture of the air by the melting snow, for the climate is naturally very dry. Our position appeared so close to Mount Savalan that I was desirous of attempting its ascent, but the natives informed me that we were at least nine farsangs, or thirty-six miles off; and that there was no regular road leading to it. Such is our deception of the distances of mountains, in an open and bare country, which presents no succession of objects by which the eye may calculate relative distances.

This mount is greatly venerated by the Persians. It derives its name from a Sherif, or lineal descendant of the prophet Mohammed, whose dead body they say still lies in one of its numerous chasms in the highest preservation. The peasantry of the surrounding plain insist that upon its summit the ark of NOAH rested, and describe the curiosities in its neighbourhood as very numerous. Its ascent would doubtless be most interesting, and at the same time most dangerous. I saw a man who assured me he had some years ago accomplished it.\* He described the undertaking as extremely hazardous, as it is surrounded with high, and partly snow-covered, walls of rock, which must be ascended to reach the top, immensely steep and fatiguing to attain: but when attained, a magnificent and striking view of Alpine scenery astonishes the beholder. The peak is surmounted with a wreath of snow, whose border is beautifully fringed and fantastically shaped.

While we were smoking our kaliuns in the evening, immediately before Savalan, with a bright moon throwing her silver touches along the line of its rugged points, I was apprized that the Prince's astrologer had been examining the stars, and according to his divination, the suite could not depart for Tabriz until the expiration of *seventy hours*; it was then to quit the town gates at midnight, to enable KHOSRO MIRZA to enter his father's capital three hours and a half after sunrise, that being the most fortunate moment of the day, agreeable to astrological calculation. This caused us to make preparations to complete the remainder of the journey alone, and consequently we departed from Ahar on the 22nd of February, at the hour of noon, with a thick mist, which at this time of the year is common to Karadaugh. After having cleared the suburbs, the fog took off, and we traversed the plain on a bearing of west. The river Ahar wound its way through

\* Captain SHEE of the Madras Infantry effected its ascent in 1827 with a party of English travellers: an account of the trip is given in Monteith's *Survey-Tour*, Journ. Geog. Soc. iii. 27. The tomb and skeleton were found on the summit, some of the dried flesh and pieces of the winding sheet still adhering to the bones.—ED.



the white unbroken surface, till it terminated in the horizon. This stream takes its rise at the village of Uzumdil, and flows throughout the district. In an hour after leaving the town of Ahar we stopt at a poor hamlet to quench our thirst. During the whole journey I suffered exceedingly, and by eating snow found that my lips were parched and burnt the more. In fact my mouth became more and more inflamed, my desire for drink fearfully augmented, and a lassitude crept over me which water alone could dissipate. The most essential article in our equipment was a small pot, in which we melted and boiled the snow water. This last is the most necessary part of the process; for if the snow is merely melted, the water has a smoked and disagreeably bitter taste; but if the water is allowed to boil, and then cooled by throwing in plenty of snow, it becomes most refreshing and delightful to the taste, and perfectly satisfies the thirsty and harassed traveller.

We traversed the plain in a westerly direction still, and commenced the ascent of an abrupt mountain, composed of schistus and pudding stone. Upon our left appeared the lofty Savalan, and although the sun's last beams had quitted our airy position, they still illumined the mount.

“ It stood before us

A mount of snow fretted with golden pinnacles.”

On descending the south-eastern face of the mountain, we obtained an extensive view of the valley below, whose romantic scenery I had not seen equalled in the stupendous regions of the Caucasus. At nightfall we reached a village on an eminence called Shehruk, and halted for the night. A crowd of women and young children collected about us, and vied with each other in proffering their assistance, some ran off for sour milk, and others to prepare bread and cheese. These lively females wore no veils, and their plumpness was well set off by large turbans, loose jackets, and capacious trousers. They all spoke the Turkish language, and appeared disappointed on finding that we were unable to converse together. Our next evening's halt was made at Khojah, a small village seated on a hill, and beside a salt stream. Our quarters at this place were most wretched, and to complete our misery, the fleas which had always been extremely troublesome were here as voracious as bull-dogs. We discovered nothing which prevented their biting the exposed part of the body, though the natives spoke of a particular grass which drove them away. The natives of the country suffer in some degree from them, but their flesh does not swell much. Nothing will keep them at bay, but smoke from wood-fires, nor will this do unless we completely envelope ourselves in the midst of it, which would nearly cause suffocation or blindness. They are

extremely greedy, and if the body of one that is sucking is cut in half, it still appears to suck, and the blood flows from where it was severed in two. Night and day they are equally annoying: it is vain to lie down at any prescribed hour, for no sleep can possibly be obtained, unless we are completely exhausted by fatigue; and in the morning the face is rendered frightful to look at, and the hands and legs covered with blood. The flies also were almost as bad as the fleas; they were larger, though not so poisonous.

Khojah is the property of one MIRZA BABA, who holds the appointment of Physician to the Prince Royal. Some years ago this erudite pupil of Esculapius was sent to London by ABBAS MIRZA, for the purpose of studying medicine, and he resided in the metropolis for a considerable time, but it appears he was too lazy to obtain his diploma. As he was temporarily attached to the suite of Prince KHOSROU, I had an opportunity of seeing a good deal of him; and like most Asiatics that I have met, his countenance was so entirely at variance with his conduct as to defy the boasted science of a physiognomist. He always considered his *kaleun* a part of himself; and in excuse for being "*Entre deux vins*," he stoutly maintained that owing to the cold and moisture of the weather, it was highly salutiferous to swallow a dram whensoever it could be obtained. His sobriety, however, was unimpeachable, he could drink all day with impunity: you might as well have attempted to intoxicate a sponge. In fact, the only advantage he appeared to have gained over the rest of his countrymen was that of having added *our vices* to his own.

[*To be continued.*]

V.—*Observations on the Golden Ore, found in the Eastern Provinces of Mysore in the year 1802. By Lieut. JOHN WARREN, H. M. 33rd Regiment.*

[On looking over the manuscript papers of the Asiatic Society, we have found the following account, dated in 1802, of the mines near Venkatagiri in the Carnatic, which, as it gives the original observations of an officer of ability, known as the author of the *Kala Sankalita*, we are induced to publish at this moment, when the gold mines of the opposite coast are attracting public attention both at home and in India.—ED.]

As I was employed in surveying the eastern boundary of Mysore in the month of February, 1802, I heard a vague report that gold had been found in the earth somewhere near a small hill, about nine miles east of Budicatta\*, and on which the frontier I was then describing

\* Yerra Baterine Hill.

was shortly to take me. I accordingly directed my people to make every inquiry which might tend to establish the fact, and offered a reward to any who would communicate information respecting it.

This being held out throughout the country within my reach, a ráyat of a small village called Wurigam, presented himself and offered to show the place, which he asserted was close to his village.

Being unwilling to interrupt the service on which I was then employed, I requested, before taking any steps, that a quantity of the impregnated earth might be brought and examined in my presence: accordingly on the 11th of February, this man returned to Battamangalam, where I then was, with twenty loads of earth, which being tried, yielded a proportion of gold dust as had been asserted.

Having thus satisfied myself that there actually was in the neighbourhood a certain spot where the earth was impregnated with gold, I resolved on visiting it: and accordingly set out for Wurigam on the 17th of February, accompanied by the man who originally gave the information.

On my arrival at Wurigam, my guide assembled all the women in the village, for the purpose of collecting and washing the impregnated earth: this part of the business being entirely assigned to them, and each being provided with a small broom, a vaning basket, and an hollow board to receive the earth, moved to a thin jungle which lies close west of the village.

On arriving at the ground, they separated, and took to small nálas, or rather rutts and breaks in the ground, into which the course of the water is most likely to drive the ore, and removing the gravel with their hands, they swept the earth underneath into their vaning baskets, by the help of which they further cleared it of the smaller stones, and threw it in the hollow board above-mentioned.

Having collected a sufficient quantity of earth, they removed to a neighbouring tank, in order to separate the metal which it contained, and this was done by placing the hollow board, which contained it, in such a situation in the water as to be just overflowed when resting on the ground, and no more. They then with great dexterity stirred the earth about with the hand, so as to keep it as much as possible over the centre of the board, that the metal should fall into the pit of it, by its own weight, and that the earth should wash off over the edges. This operation (which generally lasts a few minutes) being performed, they returned the metallic substance, which they thus cleared, into a piece of a broken earthen pot, examining beforehand whether or not it contained any gold. This process is performed by inclining the board, and with the hand passing water over the metallic sediment which ad-

heres to it ; a method which from the superior specific gravity of the gold drives the iron particles before it, and leaves the heavier metal behind just at the edge, where from the contrast with the dull color of the iron, the golden ore appears perfectly distinct, however small the quantity.

I also caused the women to take up some of the earth at the higher places, and having seen it washed as before, a nearly equal quantity of gold was obtained, which evidently shows that the ore is homogeneous to that soil, and not fortuitously driven into the rutts from any distant place by a casual fall of rain.

Soon after, I heard that considerable quantities of that metal were formerly extracted from mines near Marcupam (a village about three miles south of Wurigam) : I accordingly moved on the same evening to that place.

On the next day (18th), having collected a sufficient number of the men\* who gain their livelihood by this apparently unprofitable trade, I went to these mines, which lie about one mile west of Marcupam, in a thin jungle connected with that near Wurigam, and situated alike with respect to the range of small hills above described.

I descended into the first mine, which was shewn me, preceded by two of the miners with lighted lamps, by means of small holes made in the sides of it for that purpose. I shall not enter at this place into any circumstantial detail of it, having subsequently had an opportunity of examining these mines with more attention than I did at this period ; and consequently shall refer the reader to the separate account given of them at the end of this paper ; I remained long enough in the present one, to see some of the stones extracted, and passed from hand to hand in baskets by the miners who were stationed at different stages of the mine, for the purpose of conveying them above ground.

Having procured about four cooley<sup>o</sup> load of stones, I removed to a second mine, which proved to be about ten feet deeper than the former, and having caused the people to extract a sufficient quantity of stones from the second pit, I then returned to Marcupam, in order to try the materials I had just collected.

Here the women resumed their part, and having taken charge of the stones, they took them to a large rock, where they pounded them into perfect dust, which being placed in the hollow board above mentioned,

\* The extracting of the ore from the bowels of the earth being attended with considerable danger, owing to occasional falls of the earth, which they have neither the means or the skill to support, as is usual in mines ; also the bodily strength which the breaking of the stones requires, makes it that men alone attend to this part of the business.

they took it to a well where the stony substance being washed off (as in the first case), a sediment likewise remained, which yielded an equal quantity of gold, as would have been extracted from an equal bulk of the earth near Wurigam. I then tried the earth at the surface at several places, and also that which was extracted along with the stones; the former yielded a small quantity of metal, the latter contained nothing but iron.

Having thus convinced myself that a considerable tract in those parts was impregnated with gold, as had been reported, I returned to Battamangalam on the 19th, where having been met by the Amildar, I inquired of him whether he had heard of those mines before. His answer was "that they had been known many years since, and that Tippú had formerly sent a Bramin (named Rájá RAMCHANDER) to examine them; but as it was found after a trial of several weeks, that the produce just balanced the expence, and left no profit to the sircar, it was dropped as a bad concern."

This account exactly corresponded with that given me by the rayats at Wurigam (near which place the Raja RAMCHANDER had carried on his investigation); having however inquired more particularly of them, how he had proceeded to business, it appeared that he never visited personally any part of the impregnated ground, and that he relied through the whole of his inquiry on the information given him by his servants. The rayats assured me that he never visited the mines at Marcupam.

Having traced this golden ore (however thinly spread) through an extent of about 10 square miles, I thought it probable that more of it might still be discovered at a greater distance. I accordingly continued my inquiries, when an old woman inhabiting a village called Buksagar\* gave an account that gold was occasionally found on the banks of the Pal-aur river, near that village, and that she had frequently attended to the extracting of it.

My public calls requiring that I should at some period or other visit that part of the parganah of Colar, I resolved on moving immediately to it, for the purpose of verifying this new intimation.

I arrived at Buksagar on the 22nd of February, and soon collected a sufficient number of persons to carry on the inquiry. They took me to the southern bank of the river, and I saw them gathering the earth at the surface to about the depth of three inches, which yielded a product fuller than that collected near Wurigam. I observed more-

\* A village on the north bank of the Pal-aur river, five miles east from Battamangalum, eight miles from Wuriam, and under the same parallel of latitude with the latter.

over that the earth being washed off, there appeared hardly any iron mixed with what remained, and I frequently perceived the golden ore (though in very small quantity) adhering by itself to the board into which it had been collected.

Any metal found in dust on the banks of a river may fairly be supposed to have been driven and deposited there by the stream. I was accordingly induced to suppose that this ore was not homogeneous to the soil where it was found, and in order to convince myself of it, I examined the stratum on the course of the river, about one mile higher up towards its source, and found it equally impregnated with the ore. I then returned to the spot where it was found in greatest abundance, and having extracted earth from a hole about two feet deep, the same being tried yielded nothing but iron. Though this experiment was favourable to my opinion, I had cause afterwards to regret not having examined the stratum at this part of the river in a more extensive manner.

A variety of circumstances compelled me at this time to extend my observations no further; and my want of professional knowledge would have induced me to give up the pursuit, had not it been for the following circumstances:

My preceding observations on this subject having been communicated to several persons high in rank under the Madras Presidency, and the report having gone abroad that gold mines had been discovered in Mysore, it excited the curiosity of some friends, who recommended that I should revisit the impregnated tract and extend my inquiries as far as I was able.

From a consciousness of my inability, I confess that I did not undertake the task without some hesitation. Having however had an opportunity of meeting the Dewan of the Rájá of Mysore at Bangalore, in April, and having found him disposed to assist my exertions as much as lay in his power, I resolved on revisiting the mines at Marcupam, and leaving Bangalore on the 19th of April, I arrived at Cargury on the same day\*.

When once a subject has been started, the mind easily follows it up, and a variety of circumstances, originally slightly considered, recur naturally to our recollection, as they tend to support a favourite opinion, and to forward the object of our pursuits.

As I surveyed the pergunnah of Uscotta, in the year 1800, I heard a story told by the Bramins, the purport of which was, that 'in pros-

\* A small village on the west bank of the Poni-aur river, in the province of Uscotta, fifteen miles distant from Bangalore.

perous years, when the gods favoured the zillah of Cargúry with an ample harvest, now and then *grains of gold were found* in the ears of the paddy which grows under the tank laying close north of that village."

I treated this at the time as a fabrication, and took no farther notice of it. But now that my mind was taken up with inquiries of that nature, on my return to Cargúry, I began to conceive that there might be more truth in the story than I at first had imagined; as it was by no means impossible that the banks of the Poni-aur might be equally impregnated with golden ore as those of the Pal-aur, its sister river, and that the plant cultivated in its vicinity might very well in that case carry up now and then a grain of gold in its growth. I accordingly resolved on trying the stratum on the banks of the Poni-aur near Cargúry; but the natives at that place being totally ignorant of the method of washing the earth, and having no utensils with me for that purpose, I was reduced to collect a certain number of loads from various places at random, and to take them along with me until I could procure gold searchers to examine their contents.

On my arrival at Daseracottapilly\*, (22nd,) I soon procured people from Wurigam to attend me, and by my experiments obtained three sparkles of gold from a load collected on the banks of an anicut or dam, which crosses the Poni-aur opposite to Cargúry: so that although the other specimen yielded nothing but iron, this instance alone was sufficient to establish that the Poni-aur, as well as the Pal-aur, rolled gold dust in its stream.

The next object for consideration was, at which place these two rivers so near to their source could have collected this ore: this I thought was a question which came home to myself, as having surveyed them to a considerable distance towards the hills from which they flow, I ought to know best the different tracts over which they went. It then occurred to me that the gold which I had formerly collected near Wurigam and Marcúpam was generally found near certain small hills, consisting of deep red clay, mostly flat at the top, and covered with that sort of hard metallic stone which in Bengal is called kankar, forming a hard crust, appearing as it were a cover to the hill.

Now, with regard to the Poni-aur, I recollected that there were three small hills of this description† about half a mile S. W. of Cargúry, which in the rainy season supply water to the tank which lays north of it, and that this river passed pretty near a long range of this kind

\* This village is on the road from Bangalore to the Carnatic by Malure, distant forty-nine miles east of Bangalore, and ten miles west of Battamangalam.

† Pattendore Hills.

near Uscotta, Sattiar, Sulvehelly, and Jangamcotta, an extent of nearly twenty miles. Again, with respect to the Pal-aur, I noticed that I had lately traced it through similar hills towards the centre of the province of Colar. From this I concluded that all such hills in this neighbourhood might be alike impregnated with the golden ore, and be the original mines where it was created. I accordingly determined on following up the tract in which they lay, and examining the stratum near every one of them up to certain high grounds near Rondúr Papanhelly, where they seem to terminate.

The small hill north of Dascracottapilly\* being of this description, it naturally became the first subject of investigation. Having now collected a regular working party, consisting of a Duffadar, or overseer, and thirty Dheru women, I began to search the adjacent ground, and the first place which I examined on the N. E. side of the hill, yielded an ample produce of very fine gold dust. I was equally successful when I examined the other sides, and particularly noticed that a sort of red earth generally two feet deep, and succeeded by a white calcareous earth of equal depth, the under-stratum of which is composed of large white decayed stones, seldom failed to contain an ample proportion of metal, — a circumstance which induced me to think that the same sort of earth, though remote from the hills, might be likewise impregnated with ore; and in order to satisfy myself of it, I removed to a rutt, distant about one and half mile from Baterine Hill, and totally unconnected with it, where having collected a few loads of red earth, and washed it, the first load which was examined yielded (a circumstance wholly to be ascribed to chance) as much as twenty from any other impregnated place. This agreeable surprize, however, did not last longer than the time of trying the remaining loads, which yielded exactly the same proportion as the earth near the hill had done.

Having thus satisfied myself of the merits of this red clay, I directed the gold searchers to spread in various directions at a distance from the hills, and to gather in preference wherever they found it. I had the satisfaction to find my conjectures proved invariably well founded, having tried on that day the tract near Daseracottapilly at more than twelve different places, every one of which yielded a satisfactory product.

It will surprise persons unacquainted with the character of Indians to hear, as I inquired of the inhabitants of the village close to which I had discovered gold dust, whether they ever had noticed particles of it on their ground (some of which are actually large enough to be dis-

\* Baterine Hill.



cernible when mixed with the stratum), their answer was, “ That their business being to cultivate the ground, they never troubled themselves to look for gold in the earth, and consequently had never observed it before.” I did not hesitate in agreeing with them that they had taken to the most profitable pursuit of the two. Having thus explored the tract near Daseracottapilly, I moved on the 26th to Pedipilly (a small village east of the pass, and about four miles east of Daseracottapilly), and with a view to save a number of useless repetitions, I shall briefly say, that in order to establish the opinion which I had broached respecting the merits of the small hills and red earth above alluded to, I successively examined the whole tract from Baterine to Yerra Baterine Hills, an extent of about twelve miles in length by four in breadth; during which inquiry I only was disappointed twice on more than thirty experiments, and I remained satisfied that the gold dust was not more peculiar to the tract near Wúrigam and Marcúpam than any where else within two miles on each side of the range of small hills or pass above-mentioned: these places being only noticed in preference by the natives on account of their inhabitants devoting more exclusively their time to the searching for gold than those at any of the surrounding villages.

From Pedipilly to Yerra Baterine Hills, the superior stratum is generally composed of a brown earth, mixed with gravel about two feet deep; it is almost every where succeeded by a sort of grey argillaceous earth, and at some places by a white calcareous earth, when the superior stratum alters to a bright red.

During the three days I halted at Marcúpam, I kept twelve men in constant employment, both to assist me in collecting specimens of the strata, and to extract gold from the stones. Ten of them were employed the first day in digging out stones, and half of the next in pounding them and extracting the metal—the produce of their labour was in weight *two grains* of gold only.

So small a quantity of metal for so much labour induced me to think that I had not been fairly dealt with; for were these the usual products, it could not possibly be worth these men’s while to attend to so unprofitable a trade. I had moreover observed that two mines had been sunk since I had last visited Marcúpam, a sure sign that the business was carried on very briskly. The people who devote their time to the searching for gold, are exclusively of the Dheru (or Pariah) caste. The following is their mode of carrying on the work:

When they resolve on sinking a mine, they assemble to the number of about ten or twelve men from different villages. They next proceed in appointing a Duffadar (or head man) among themselves, whose busi-

ness is to superintend the work, and to convert the products into money. They then make a purse to purchase a sufficient quantity of lamp oil, and the necessary iron tools. This being done, partly from a prejudice they entertain that the tract over which a peacock has been observed to fly and alight is that of a vein of gold, they fix upon a spot, and then proceed to business.

Having examined the mines near Marcúpam, I proceeded in carrying into execution the plan which I had formed of investigating the stratum about the small hills extending north of Daseracottapilly, and also the banks of the Pal-aur river.

The service having taken me to a different tract from the 1st to the 4th of May, I had no opportunity of making any observation until I arrived at a small village called Nellore on the western bank of the river, one and half mile north of Battamangalam. I turned my attention in the first instance to the banks of the Pal-aur, from the bed of which I obtained a few particles of gold, much the same in point of quantity as what I had found at the second place, which I examined near Bakagur.

Having noticed on the same day a deep rutt in the ground, exhibiting the same sort of red clay as I have formerly described when near the hills, running from west to east towards the river, I thought it offered a good opportunity to establish whether the golden tract extended so far to the eastward; as it would at the same time (in case of success) explain whence came the gold dust found in the river, my experiments proved perfectly satisfactory, and I remained well assured (this impregnated spot lying far beyond any possible overflow of the river) that it did not receive its contents from the stream, but on the contrary, supplied it with golden ore. I also formed an opinion that the metal was not more peculiar to the hills than to the whole tract in which they lay, comprehending a space of several miles east and west of them, and extending more particularly to the eastward, somewhat beyond the banks of the Pal-aur river. This induced me to examine the interval between Mútiál Ghât and Manigatta Hill, an interval of about eleven miles in extent, through which the range is interrupted, and presenting a tolerably even surface, only encumbered with large granite stones, which bespoke more of iron than of gold.

On the 5th of May, moved to Carapanhelly, near Baterine Hill: on this and the following day, examined successfully the whole of the tract north of the hill. The stratum being at some places of a deep-brown earth, succeeded by a grey argillaceous earth; at others of a red clay, succeeded by white calcareous earth and stones.

On the 7th, moved to Shapúr, examined the ground at several places in the interval; stratum as before; found it everywhere equally impregnated. On the same evening, visited the banks of the river (about two miles east from Shapúr) with equal success, noticed a bed of white calcareous stones (the common under-stratum of the metallic earth) crossing the river from bank to bank where I stood.

On the 8th, moved to Manigatta, close north of which place the range of small hills resumes; found gold at every place which I examined in the interval, but evidently decreasing in point of quantity. Strata as before.

On the 9th, examined the course of the river which crosses the impregnated tract close north of Manigatta, and touches the south extremity of the small hills north of it. Made trial of the soil, and more especially of the highest earth collected at the surface within reach of the stream for upwards of two miles west of the hills, and gave up the pursuit when still obtaining a few particles of gold from the earth taken at random within reach of the course of its water.

On the 11th, 12th, 13th, and 14th, examined the tract about the Manigatta, Wúllúr and Yeldúr Hills; found it every where (though extremely thinly), impregnated with gold, the upper stratum being generally composed of a deep, brown earth, and succeeded by a livid-flesh-colored calcareous earth at some places, and particularly about Yeldúr, changing to a beautiful pink color.

On the 15th, 16th, and 19th, examined successfully the cluster of small hills which lay east of Randúr Papanpilly. These small eminences terminate, to the northward, the frequently interrupted range which has been the subject of the present investigation, and were the winning goal I had kept in view ever since I began this second inquiry. Having however taken notice of a small hill lying about seven miles due east of these, near Ramasandra, and apparently of the same description; on the 26th I examined the stratum both in the interval and about it, and found the earth every where impregnated with gold: having thus traced it uninterrupted right across this extensive pergunnah, and being precluded of any farther investigation by the chain of large hills which lay north of Ramasandra, and are connected with the eastern ghâts north east of Panganúr.

The country north of the Randúr Papanpilly hills loses altogether its ardent and ungratifying appearance, it exhibits an extensive plain, beautifully variegated with cultivated fields, tanks, and mango groves; a scenery very seldom to be met with near the golden tract, which is almost every where covered with a scanty, unthriving jungle, the soil being supposed by the natives to contain certain foal substances inimi-

cal to agriculture. Eager as they seem every where else to avail themselves of the vicinity of rising grounds to construct tanks, here on the contrary, hardly any structure of this sort is to be seen. Nay, at many places, the ráyats turn by means of artificial water-courses the noxious streams, which during the rainy season descend from those chalky pits, towards their fields, thus unknowingly exemplifying that great common-place of moral philosophy, which teaches us to disdain the hidden and corrupting treasures of the earth, and look to the plough for abundance and prosperity.

*Particulars of the mines examined by Lieut. WARREN, in the month of April, 1802.—1st Mine, west of Kembly.*

The entrance of this mine is at the level of the tract in which it stands. It is in breadth two feet; in length, four feet; in perpendicular depth, about 30 feet; in extent 50 feet.

The upper stratum is composed of a deep-brown earth to the extent of about  $1\frac{1}{2}$  feet, (No. 1.) Then succeeds a stratum of grey argillaceous earth, mixed with gravel, about one foot deep, (No. 2.) Next follows a bed of deep-brown earth, similar to that at No. 1, four feet deep, (No. 3.) under this is a stratum of hard grey and yellow clay, four feet deep (No. 4,) where the mine ceases to descend perpendicularly; and an even space is met at this stage, intended as a place of rest.

From this the mine descends at an angle of about  $10^{\circ}$  from the foot for four feet deeper. It then branches off into two separate galleries, one of which strikes to the southward, and at six feet offset subdivides into two branches, one of which follows the original southerly direction to the extent of 36 feet, the stratum being of a hard whitish argillaceous earth. (No. 6). The other branching off in a south-easterly direction, to an extent of 20 feet, the stratum being the same as at No. 6.

The other principal gallery extends westerly in a straight direction, at present only accessible to 24 feet, where it is encumbered with fallen earth, (the stratum being the same as No. 6, in the two preceding galleries,) in each of which the metallic stones are found.

These stones are generally of a siliceous nature, of a black, changing to deep rust colour, where they seem to decay. A few parallel streaks are observable in them, about which adheres a green and yellow substance, which marks their value to the natives as they search the mines, (No 7.)

N. B. Although this mine appears to have been much searched, it is still very productive, at least in the ideas of the natives.

*2nd Mine.*

Being the same with that visited by me on the 28th of February.

The entrance of this mine is in a hollow place, about six feet below the level of the surrounding tract, and lies nearly due west of Súrín-pally. It is in breadth two feet ; in length, four feet ; in perpendicular depth, about 45 feet ; in extent, 56 feet.

The upper stratum is composed of a black argillaceous earth, mixed with gravel, about three feet deep, (No. 1.) Then succeeds a stratum of dark-brown earth, mixed with stones, about six feet in extent (No. 2), under this is a bed of hard clay, at some places in black and yellow streaks, in an oblique direction ; about four feet deep, (No. 3.) Next follows on the north and west sides a bed of large black stones, of a hard, compact argillaceous nature (No. 4); the stratum on the east and south sides being of the same sort as (No. 2). Next follows a stratum of black earth, mixed with gravel, about four feet in extent (No. 5), where the mine ceases to descend perpendicularly, and where (as in the preceding one) a resting place is found.

The mine then descends at an angle of about  $20^{\circ}$  from the foot, for 32 feet direct ; the stratum being composed of hard black clay (No. 6,) in which are found two sorts of stones. The one similar to that described No. 4, containing in the opinion of the natives no metallic substance whatever. The other being a hard white siliceous stone, about which generally adheres a deep orange soft substance, which marks its value to the miners, and generally appears where the stone splits as it is broken (No. 7).

[The particulars of two other mines differ in no material respect from the preceding ; they are accordingly omitted.

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In the Madras Literary Gazette for May 10th, 1834, appeared an interesting editorial notice, derived from official documents, of the gold mines in the province of Malabar, the first printed account, as it is stated, of these gold works.

There is also a notice of the same mines in the Mechanic's Magazine for 1834, page 43, which states that although they became known to Mr. DUNCAN, Governor of Bombay, in 1793, they had remained neglected for forty years, until the Madras Government lately issued an order for registering all gold found in the collectorate of Calicut. Surveyors were also deputed to examine the district.

The principal mines examined by the late Dr. WARD, according to his report, were five miles S. W. of Nelambúr : their depth, and the mode of working them, resemble the foregoing description. The produce from 66 lbs. of the earth was about one grain. The African sands sometimes yield as much as 36 in the same quantity. The total quantity extracted per annum does not exceed 750 ounces, or 30,000 rupees value. The mines now worked are Cherankode, Devala, Nelyalam, Ponery, and Pulyode, in the Wynaad district : the rivers Srupumjee, Polwye, and Tirumpaddy rivers in Calicut ; Punaur and Malapuram rivers in Kurmenad ; Pandalúr and Aliparamb rivers in Nedinganad ; Kadalaondy and Parpanangady on the sea shore in Shernad ; Kapil, Aripnad, and Tírúmalý Hills in the Ernaad district ; besides twenty river works unnecessary to enumerate.—Ed.]

VI.—*Abstract Statement of 412 Villages in Zillah Burreilly. Settlement under Regulation VII. 1822.* By H. S. BOULDERSON, Esq. Collector.

The following statement, for which we are indebted to the Secretary of the Allahabad Sudur Board of Revenue, will give a just notion of the produce of land in the Rohilkund districts.

Pargannah.	No. of Villages.	Total Area in Acres.	Deduct exclud- ed from Assess- ment.	Málguzári Land.			Jamma per an- num of years subsequent to 1831.	Average per acre on Málgu- zári Land.	Average on Cultivation.			
				Cultiva- ted.	Cul- tura- ble.	Total.				Rs.	R.A.P.	
											Ac.	Ac.
1 Bisalpur, . . . . .	13	5,128	1,252	3,050	826	3,876	9,352	2 6 6	3 1 0			
2 Chaumehalla, . . . . .	13	4,884	1,170	2,180	1,534	3,714	5,475	1 7 7	2 8 0			
Ditto, . . . . .	8	2,339	414	1,240	585	1,925	2,524	1 4 10	1 14 0			
3 Kroa, . . . . .	58	25,980	8,626	12,740	4,614	17,354	29,724½	1 11 5	2 5 0			
Ditto, . . . . .	30	17,203	5,320	7,895	3,988	11,883	17,587	1 7 9	2 3 7			
4 Faridpur, . . . . .	29	11,459	2,558	5,230	3,671	8,901	13,571	1 8 5	2 9 0			
5 Nawábganj, . . . . .	51	23,835	6,567	13,294	3,974	17,268	35,296	2 0 8	2 10 0			
Ditto, . . . . .	10	3,844	877	2,427	510	2,967	6,897	2 5 2	2 13 0			
6 Aunla, . . . . .	28	17,834	6,754	5,614	5,466	11,080	13,431	1 3 5	2 6 0			
Ditto, . . . . .	2	1,919	600	1,033	286	1,319	2,237	1 11 2	2 2 7			
7 Shabie, . . . . .	53	23,577	6,997	12,320	4,260	16,580	30,527	1 13 5½	2 7 0			
Ditto, . . . . .	31	16,742	5,305	7,200	4,237	11,437	20,016	1 12 0	2 12 0			
8 Sirsaweh, . . . . .	23	12,254	2,904	8,310	1,040	9,350	21,360	2 4 6½	2 9 0			
Ditto, . . . . .	38	17,239	4,226	11,600	1,413	13,013	31,229	2 10 1	2 15 0			
9 Sandha, . . . . .	14	6,230	3,380	2,260	590	2,850	5,438	1 13 6	2 6 0			
10 Tissúa, . . . . .	2	419	144	154	121	275	413	1 8 0	2 10 10			
11 Ajaon, . . . . .	2	2,262	802	1,035	425	1,460	2,454	1 11 0	2 6 0			
Ditto, . . . . .	3	2,658	612	1,675	371	2,046	4,351	2 2 0	2 9 0			
12 Kábar, . . . . .	1	529	105	367	57	424	912	2 2 5	2 8 0			
Ditto, . . . . .	3	3,489	1,117	2,085	287	2,372	4,286	1 12 10½	2 0 10			
Grand Total, . . . . .	412	1,99,824	59,730	1,01,809	38,285	1,40,094	2,60,980½	1 13 8½	2 8 10			

VII.—*Proceedings of the Asiatic Society.*

*Wednesday Evening, the 1st October, 1834.*

[Col. Sir JEREMIAH BRYANT, Sen. Mem. present, in the Chair.]

Lieutenant MACLEOD, Madras N. I., attached to the Burmese Embassy, and Lieutenant-Colonel JAMES LOW, Resident at Lucknow, proposed at the last Meeting, were balloted for, and duly elected as members of the Society.

Read a letter from N. WALLICH, Esq. M. D. Acting Secretary of the Agricultural and Horticultural Society of Bengal, expressing the thanks of the Society for their present of Kandahar tobacco, cotton-seeds, &c.

Read a letter from Professor FRANK, expressing his best thanks for the 17th volume of the Asiatic Researches received through their late Secretary, Professor H. H. WILSON.

Also one from CH. D' MEIGS, Secretary of the American Philosophical Society, acknowledging receipt of volumes 16th, 17th, and 18th of the Asiatic Researches, and volume 1st of the Journal As. Soc.

Extracts were read of private letters from Professor WILSON, and Mr. GEORGE SWINTON, on subjects interesting to the Society.

The celebrated sculptor CHANTREY has at last undertaken to execute the bust of our late Secretary. Some delay is anticipated, as he is at present engaged in a colossal equestrian statue of Sir THOMAS MUNRO for Madras, and a full length of Sir J. MALCOLM for Bombay.

A fresh supply of the 15th volume, Asiatic Researches, was required, all hitherto sent home having been disposed of.

SIR DAVID BREWSTER is at present engaged in a work on the crystalline lenses of animals, and he is anxious to procure specimens of the eyes of all the fishes of the Ganges. Those who have opportunities of supplying this desideratum are requested to wrap the eyes up in thin-sheet-lead, numbered with reference to a catalogue of their names and species, and then all may be enclosed together in spirits of wine. Mr. SWINTON thus sent home the eyes of elephants, tigers, &c. on a former occasion.

Mr. SWINTON, referring to the notice in page 304 of the Journal for July 1833, intimates that he has received back from Sir D. BREWSTER the amount of Indian subscriptions for the polyzonal lens, with bank interest at 2 per cent., and that he holds it at the disposal of the subscribers to be paid to their agents in England. (A notice to this effect is printed on the cover of the present month.)

#### *Library.*

Read a letter from J. VAUGHAN, Esq. Librarian of American Philosophical Society, forwarding the undermentioned books for presentation.

Transactions of the American Philosophical Society, volume 4th, part 3rd, new series.

Facts, observations, and conjectures relative to the Generation of the Opossum of North America, in a letter from Professor BARTON to Mons. ROUME of Paris.

Laws and Regulations of the American Philosophical Society.

Note of the effect upon the magnetic needle of the Aurora Borealis visible at Philadelphia on the 17th May 1833, by A. D. Backe.

Observations on the disturbance in the direction of the horizontal needle, by A. D. Backe.

Memoirs of the Historical Society of Pennsylvania; and various pamphlets on the subject of canals and institutions for education.

The following works were also presented :

Memoirs of the Astronomical Society, volume 7th—*presented by that Society, through the Honorable the Court of Directors.*

Select papers on expressing the languages of the East in the English character—*presented by Mr. Trenelyan.*

A brief account of the religion and civil institutions of the Burmans—*by H. N. Thakoor.*

Journal Asiatique, Nos. 73 and 75,—*by the Asiatic Society of Paris.*

Boorhāni Qāfiu, a Dictionary of the Persian language, a new edition, edited and printed by Hakīm Abdulmojid—*by the editor.*

#### *Museum.*

Model of a musical instrument and a battle-axe used by the hill people near Hazaribagh—*presented by Lieutenant J. Awdry.*

Specimens of the shells and corals from the Isie of Socotra were presented by Mr. J. CURNIN, on the part of Mr. H. V. LYNCH. •

Specimens of the rocks in the jungle mehals, particularly of the strata exposed to view by the new road, cut in the Katjor pass of the Dalma range of hills, separating Burrabhum and Pátkún from Dholbhúm and Singhbhúm; were presented by Lieutenant Western, Engineers.

The fossil tooth alluded to in Dr. SPENSBURY'S last communication, was received from Dr. Row.

Specimens of basalt, white porcelain clay, coal, and pyrites from Sadiya in Assam were presented by Lieutenant H. L. BIGGEE, Adjutant, Assam Light Infantry.

A note was read from Lieutenant ARCHBOLD, enclosing a letter from an Officer of H. C. Sloop Coote, stating the impossibility of finding a conveyance for the mummy left there by him, in consequence of the prejudices of the Mahomedan seamen. It had become necessary, after many endeavours to get it away from Mocha, to bury it at that place!

Read a letter from Lieutenant W. FOLEY, dated Khyook Phyoo, Arracan, 6th September, transmitting Journal of a tour through the *Island of Ramree*, with a Geological Sketch of the country, and brief account of the customs, &c. of its inhabitants.

Extracts from Lieutenant FOLEY'S journal were read, and the thanks of the Society were voted for his valuable communication.

[The journal will be published in an early number.]

A notice of a new coin with the monogram of figs. 1 and 8, Plate ix. of Hindu coins, volume iii. Asiatic Society's Journal, was received from Major STACY, and read.

A note by the Secretary was read, on the perfect identity of the inscriptions of the *lath* of FEROSZ SHAH at Dehli; BHIM SEN'S *lath* at Allahabad; and the column bearing the same name near Bettiah.

[The notice of this curious and important fact will appear in the next number.]

### VIII.—*Miscellaneous*

#### 1.—*On the making of Chinese Paper; translated from the 23rd Volume of the Pun Tsaou Kang Muh.*

[From the Trans. Soc. Arts, xlix. pt. 2.]

In ancient times, bambus were connected together, and letters burnt on them, to form books; and hence the several characters employed to denote papers and documents are formed partly with the character for "bambu."

In the time of the Tsiu and the Han dynasties, letters were written upon silk cloth; and hence the characters for silk and cloth are component parts of the character used for paper.

In the time of the Emperor Ho Te, (A. D. 100,) Tsac Lun began to take the bark of trees, old silk of different kinds, fishing-nets, and hemp, and boil them to rags, and make paper of them, which was used throughout the whole of the empire.



Another authority says, the people of Shuh, on the western side of China, use hemp or linen to make paper; the people of the East, in Fokin, use tender bambu; the people of the North, the bark of the mulberry; others use the rattan; some, mosses or lichens; some, the straw of wheat or other grains; some, the cocoon of the silk worm; and others, the bark of the Chu-tree (syn. of Ruh), the *Brousonettia*.

*Sha Che, or Crape Paper.*

This paper is brought from among the mountains of Nanking, in the province of Kwang Se.

In spring, during the first and second moons, they take the bark of a tree called Ruh-muh (*Brousonettia Papyrifera*), and having pounded it, throw it into a stone reservoir of pure water, where they leave it to steep till it is fit for use. They then take it out with the sediment, and pouring into it cow-skin glue, boiled with water, stir all together. Taking up this mixture with a mould of bambu screen of the size required, they put it out into the sun to dry, and it becomes crape paper.

The Chinese paper called touch-paper (or paper fuel) is made at the village called Peih Keang, a few miles from Canton, of the variety of bambu called Lang.

At the beginning of summer, during the fourth and fifth moons, the young sprouts of the bambu are cut off just as the leaves are beginning to grow, and, having been beaten flat, are thrown into a lime-pit to steep for about a month. They are then taken out, washed clean, and dried in the sun. After which, they are pounded small, passed through a sieve, and laid up. The kernel of the Longan fruit (*Dimocarpus longan*) is also used, being pounded small, dried in the sun, and passed like flour through a sieve. When making the paper, this powder is put into clean water, stirred about, then taken up with a mould made of bambu screen, and the water left to run off. It is afterwards applied to a heated wall to dry, and the paper is then complete.

For coarser or finer paper, a coarser or finer mould is used.

The person who made the drawings says, the bambu is cut into lengths of about three feet, tied up into bundles of seventeen each, and put into running water, where it stays six months. It is then put (in the same bundles) into pits made in the ground, mixed with quick lime made from the shells of the *Venus Sinensis*, pressed down with weights, and left for six months longer. The bundles will have been thus soaked for twelve months: they are then taken out, cut into short lengths, put into one of the usual Chinese pounding mills, and beaten down into pulp; being stirred occasionally, so as to present a new surface; about four hours' labour will break it down.

Pits, twelve covids deep and ten long, contain 2000 bundles of seventeen pieces each, weighing about 24 catty, or 32 pounds.

Cisterns are about eight covids long, in two partitions, two and six broad, and two pailfuls of water are used to one of the pulp.

*King Yuca Paper.*

During the fourth moon, at the close of spring and commencement of summer, the bambu shoots are cut off at the length of three or four covids, (14-625 inches,) and the size of six or seven inches, and then thrown into a lime-pit to steep for about a month. They are then taken up, washed clean, and bleached every day, till they are of the purest white; after which, they are dried in the sun, pounded small, and passed through a very fine sieve, and the finest and whitest part of the pow-

der taken for use. With this is used also the best white cotton of Loo Chow, ten times bowed (or bolted), and the very light cotton which is uppermost taken for use.

Rice-water, made from the whitest rice, being mixed with these two ingredients, the whole is taken up with a mould made of bambu screen of the size required, and then applied to heated wall to dry.

This forms the whitest and finest King Yuca paper.

The above notes were accompanied by seven outline drawings, made in China, of the various processes of manufacturing paper from the bambu, which drawings, by the liberality of Mr. REEVES, have been placed in the Society's Library.

## 2 — *Preventing the Adhesion of Earthy crust to the Inner Surface of Steam Boilers.*

[From the Trans. Soc. Arts, xlix. pt. 2.]

Almost all natural waters hold in solution both carbonate and sulphate of lime, two earthy salts, of which the former is thrown down by bringing the water to a boiling heat, and the latter by evaporation. On this account it is, that if the inside of a steam-engine boiler be examined, after having been in use for a few days, it will be found to contain muddy water, and an earthy crust will be seen adhering to the iron plates of which the vessel is formed. The rate at which this crust is deposited depends on the hardness of the water employed, that is, on the proportion of the above-mentioned earthy salts which it contains. This crust is a much worse conductor of heat than iron is, and, therefore, a boiler lined with it, even to the thickness of the tenth of an inch, possesses the following defects. The water which it contains is not so soon brought up to the boiling point, and a greater quantity of fuel is required to produce a given quantity of steam, because a large proportion of the heat given out during its burning is carried up the chimney and lost. It becomes, therefore, necessary, from time to time, to remove this crust, which is naturally done by a hammer and chisel; but this operation not only incurs a waste of time, but the boiler is often seriously injured, and rendered leaky by means of it.

It has been found, if a few potatoes are thrown into the boiler when it is again filled, after having been cleaned out, that the formation of crust is sensibly retarded, and that the adhesion of it to the sides of the boiler is greatly weakened, so as to allow of its being detached more speedily, and with much less hazard.

Another method of producing the same effect has been pointed out to the Society by Mr. JAMES BEDFORD, of Leeds, druggist. He put into a large steam boiler between two and three gallons of sperm oil foots; and found that, after eight weeks constant use, the deposit of crust was very small compared to what it used to be from the same water alone, and also that the crust could be cleared off by means of a common stiff broom. The application of oily matters for this purpose, though original on the part of Mr. BEDFORD, is not absolutely new; for the Society have been informed by one of their members, that he has known an iron boiler using Thames water preserved in constant use for seventeen years by cleaning it often, and smearing the inside with oil or tallow after each cleaning.

The Society, however, have reason to believe that neither of the above methods are in common use, and have, therefore, directed this short statement to be published for the benefit of those whom it may concern.

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of September, 1834.

Days of the Month	Barometer reduced to 32° Fahr.				Thermometer in the Air.				Dreissner's Moist-bulb Thermometer.				Hair Hygrometer.		Rain. Inches	Wind.		Weather.		
	At 4 A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	Minimum	At 10 A.M.	Max. by Reg. Ther.	At 4 P.M.	At 10 P.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	At 10 A.M.	At 4 P.M.		Morning	Evening	Morning	Evening	
1	.661	.716	.578	.683	80,8	85,3	88,1	81,1	82,2	0,4	3,3	6,2	2,0	95	.80	o.	S. F.	clear.	cumuli.	rain.
2	.648	.684	.572	.640	81,1	87,8	92,5	85,8	82,4	1,7	5,8	4,9	2,0	96	.68	e.	S. E.	cl. rn.	do	cl. rn.
3	.577	.616	.520	.534	80,4	87,0	89,9	87,6	80,7	0,7	4,8	5,7	2,2	95	.30	e.	o.	h. zy.	do	clear.
4	.545	.580	.492	.593	79,8	86,1	88,0	87,6	80,0	1,5	4,2	5,8	2,4	96	.20	e. s.	o.	cl. r.	showery.	do
5	.533	.612	.566	.648	79,1	85,9	91,8	87,7	81,6	1,3	5,1	6,7	2,8	94	.40	ne.	o.	rain.	cumuli.	do
6	.637	.580	.578	.650	80,0	86,3	92,7	86,3	85,8	0,8	5,6	8,3	2,5	97		o.	o.	clear.	fine.	dull
7	.627	.630	.518	.568	82,5	87,3	92,0	89,2	81,2	1,7	5,6	8,3	5,2	90	.40	o.	o.	overcast.	dull.	lightning.
8	.528	.560	.422	.535	80,4	88,5	91,0	88,7	82,8	1,6	4,9	6,4	4,5	89		E. E.	var.	hazy.	storm.	clear.
9	.496	.540	.470	.555	83,5	88,9	91,6	88,4	82,8	2,5	6,5	6,1	3,6	95		E. E.	ne.	clear.	overcast.	do
10	.520	.580	.536	.624	82,0	87,2	91,6	88,4	81,5	1,0	5,9	7,0	1,7	96	.15	E. E.	ne.	do	close.	do
11	.612	.678	.556	.653	81,0	86,8	91,5	88,4	82,2	1,0	4,1	5,4	1,5	97		E. E.	o.	do	thun. sho.	do
12	.611	.680	.550	.632	81,2	86,6	90,8	88,3	83,1	2,2	4,4	4,1	1,0	97		o.	o.	gathering.	cumuli.	haze.
13	.580	.636	.497	.608	80,4	86,6	90,8	88,3	83,1	0,4	4,5	7,6	3,6	93	.10	o.	o.	clear.	fine.	clear.
14	.576	.620	.490	.613	84,0	87,4	91,7	88,1	83,1	1,0	6,1	6,6	3,4	94		o.	o.	do	do	bright.
15	.574	.640	.544	.607	81,0	87,4	91,6	88,0	83,1	1,2	5,5	6,3	2,9	95	.02	e.	o.	do	do	clear.
16	.574	.740	.645	.736	81,3	87,3	93,0	88,0	83,1	1,6	5,5	4,2	3,1	95	.30	o.	o.	do	cloudy.	do
17	.608	.746	.619	.697	81,0	87,4	93,2	88,7	83,1	0,6	5,6	5,1	2,4	97		o.	o.	do	do	cum. strat.
18	.661	.720	.640	.710	82,1	88,8	93,4	88,4	82,0	1,1	3,4	4,1	2,9	99	.60	o.	o.	haze.	rain.	clear.
19	.683	.790	.690	.783	81,8	89,9	94,4	89,1	82,2	1,7	3,1	3,2	1,6	97		o.	o.	cum. strat.	hne.	scud
20	.706	.822	.678	.757	81,0	89,2	94,5	89,1	83,2	1,7	4,1	4,8	2,7	97	.75	o.	o.	scud.	set rain.	cum. strat.
21	.724	.726	.612	.704	83,2	89,7	94,7	89,4	83,3	2,5	3,9	4,6	0,6	98	.65	o.	o.	cum. strat.	clouds.	clear.
22	.657	.614	.570	.661	79,9	83,3	88,9	84,6	78,0	1,5	3,9	5,5	2,1	96	.25	o.	o.	rain.	showery.	stratus.
23	.633	.654	.556	.687	73,1	83,4	87,3	85,0	82,2	1,4	3,1	5,7	2,5	96	.20	o.	o.	hard ri.	all day.	fine.
24	.674	.726	.619	.696	76,2	83,5	89,1	85,9	82,2	0,0	4,2	4,2	1,6	95	.50	o.	o.	scud.	cl. rdy.	buzy.
25	.653	.721	.556	.673	81,0	84,7	90,7	87,2	83,1	1,0	4,2	4,5	1,6	97		o.	o.	hazy.	do	cl. lighting.
26	.646	.680	.574	.686	81,0	84,9	88,8	87,2	83,1	2,7	4,0	4,9	2,6	97		o.	o.	stratus.	do	do
27	.642	.648	.505	.633	81,3	84,5	89,8	88,3	82,7	1,0	4,7	5,6	1,0	96		o.	o.	clear.	fine.	do
28	.604	.707	.620	.730	82,0	85,3	90,0	88,1	85,0	1,5	5,9	9,7	3,5	86	.05	sw.	sw.	do	rain.	cloudy.
29	.607	.794	.600	.766	83,1	85,9	93,0	86,0	82,0	1,8	6,1	6,5	1,5	91	.05	o.	o.	do	cl. rdy.	clear.
30	.742	.762	.656	.750	81,2	85,7	94,0	86,4	82,6	1,5	5,5	7,0	3,3	91		o.	o.	do	do	
Mean,	.628	.673	.574	.666	81,2	85,9	90,3	86,4	82,6	1,3	4,9	5,9	2,5	94,9	8,6	light variable.				much rain this month.

The instruments were all situated as usual.

**JOURNAL**  
OF  
**THE ASIATIC SOCIETY.**

*No. 34.—October, 1834.*

I.—*Notice of some Ancient Inscriptions in the Characters of the Allahabad Column. By B. H. HODGSON, Esq. Resident in Nepal.*

[In a Letter to the Secretary, read at the Meeting of the 28th May, 1834.]

With reference to the remarks in No. 27 of the Journal on the Allahabad Column, and, more particularly, to the note at the foot of page 116, I hasten to inform you, that some 8 or 10 years ago, I sent to the Asiatic Society drawings and descriptions of a column, and inscription, which I found in the Tarai of zillah Sáran, half way between the town of Bettiah and the river Gandac, west and a little north of Bettiah, and very near to the Nepal frontier. There is a similar pillar, and similarly inscribed, close to the high road from Segonly to Patna; and though this be, I suspect, in zillah Tirhút, not Sáran, and though STIRLING call his Láth, the *Sáran* pillar, yet I believe him to allude to the latter monument, and not to mine: because the latter is situated in a frequented country, and commonly traversed route to and from sundry familiar places; and if not in Sáran, it is, at least, close to its boundary; whereas the former stands in a desert out of the way of all ordinary routes. At all events, whether STIRLING alluded to one or the other monument, it is certain, that there are *two* in north Behár; that both bear inscriptions of an identical character with your No. 1; and that both columns resemble in size and shape the Allahabad one, and that of FIROZ SHAH. I possess likewise an inscription, procured from the Śágar territories, written in the very same character. When therefore we consider the wide diffusion over all parts of India of these alphabetical signs, we can scarcely doubt their derivation from Deva Nágarí, and the inference is equally worthy of attention that the

*language* is Sanscrit. I use the words Deva Nágarí and Sanscrit in the largest sense, and mean thereby, the language and literal symbols of the learned Hindus; for, you know, it is a question whether the existing Deva Nágarí and Sanscrit be the primitive types, or, only the last results of refinement of older forms. The learned among the Hindus, so far as I know, adhere to the former opinion, and insist that all the Bháshas and their written characters, are derivatives from the primitive and perfect types, viz. Sanscrit and Deva Nágarí. And, with reference to the variety of alphabetical signs, which are daily being discovered by us, the common assertion of the Pandits of both the Brahmanical and Bauddha faiths is particularly worthy of observation. They say that there are, or were, no less than 64 Bháshas, each with its appropriate alphabet, derived from Sanscrit. Now, though the round number, 64, should probably be received with a grain of reserve, yet the many new varieties (so to speak) of Deva Nágarí, which we have discovered in the last 10 years, obviously drawn from that type, tend to confirm the general truth of what the Pandits assert; and, at the same time, warrant the expectation that we shall find many more yet, as well as countenance such presumptions as that your Nos. 1 and 2 are essentially the *same*, and that both are essentially *Indian*, or (in the language of the Pandits, varieties of the Deva Nágarí type.

When I forwarded the drawing of the *Mathiah* pillar, (for so it is called by the neighbouring peasants,) with copy of the inscription upon it, to Dr. WILSON, I noticed the resemblance of the letters to those of Tibet, as well as that of the couchant lion\* on the top of the monument to the effigies of the same animal, forming the most common sculptural ornament of a certain class of temples in Nepal. And I observed to Dr. WILSON, that those circumstances had led me to hope that some Nepalese Pandit of the Bauddha faith would have been found capable of expounding the inscription:—an expectation in which, I added, I had been disappointed. If you examine the records of your museum, you will, I hope, find the *Mathiah* pillar and inscription; but, if not, and I still retain (of which I am doubtful) copies of them, I will forward them to you; and also, if you desire it, the *Ságar* inscription.

*Kathmandú, 24th April, 1834.*

I have just ascertained from LOKRÁMAN UPADHYA, the Nipalese Wakil, that there are *three* Láths in North Behár, inscribed with the

\* Lieut. BURT'S *Bull*, which crowned the Prayág Láth, is or rather was, I suspect from analogy, a *Lion*.

character No. 1, and, moreover, a Déhgôp, or hemispherical Bauddha mausoleum and temple, in the same region.

The first of the Lâths is the well known one near Bakra, in sight of the high road to Hajipur, and this is surmounted by a lion. The second is at Radiah, near Arahrâj-Maha Deva, district of Majhouah, and zemindary of Bettiah, and it has *no* lion.

The third is the Mathiah one, between the town of Bettiah and the Gandac, eight or ten miles (perhaps more) west, and a little north, of Bettiah town. It has a lion. I find that my copy of the Mathiah inscription is gone home; you shall have a new one made, if you need it. And I have ordered drawings and inscriptions to be taken from the other two pillars.

I have likewise directed a drawing to be made of the Kesriah mound, which is undoubtedly a Bauddha Déhgôp or Chaitya, and such also is the Mânikayâla tope. There are *scores* of them in this valley.

11.—*Note on the Mathiah Lith Inscription. By JAS. PRINSEP, Sec. &c.*

Since writing the above, Mr. Hodgson has favoured me with a native drawing of the column near Bettiah, which is engraved as figure 2 of Plate XXVII.; and a copy of the inscription it bears is given at length in Plate XXIX. The accuracy of the copy from the MS. has been verified by careful examination, but the native engraver, to save space, has unfortunately carried on the whole text continuously, so that it does not shew the commencement of each line according to the original. This defect I have endeavoured to remedy by placing small figures to mark the beginning of the lines, as it was hardly worth while to re-engrave the whole plate.

The character of this inscription was at once of course recognized to be the same as that of the Allahabad column and Feroz's Lâth. The initial word of each paragraph was also soon perceived to agree with the specimen given at the foot of Plate V. of the present volume—the identity continuing even further than the five letters there marked, and extending, in all the numerous cases where the form occurs, to the following fifteen letters—

ॠॡॢॣ।॥१ॡॢॣ।॥१ॡॢॣ।॥१ॡॢॣ।॥१ॡॢॣ।॥१ॡॢॣ।॥१ॡॢॣ।॥१ॡॢॣ।॥

The trifling variations which may be perceived in one or two of the readings of this sentence, which may be supposed to be some formula of invocation, are evidently attributable to errors of transcription.

Upon carefully comparing the Bettiah inscription with those of

Allahabad and Delhí, with a view to find any other words which might be common either to two or to all three of them, I was led to a most important discovery; namely, that *all three inscriptions are identically the same*. Thus, the *whole* of the Bettiah inscription is contained verbatim in that of FERROZ'S LÁTH, published in four consecutive plates, in the seventh volume of the Asiatic Researches: and all that remains of the Allahabad inscription can with equal facility be traced in the same plates, with exception of the five short lines at the bottom, which appear to bear a local import. The last eleven lines of the *east* inscription of the obelisk of Delhí have indeed no counterpart in the other two; but this may be also owing to the destruction of the corresponding lines of these two texts, which happen to be, on them, the final and nethermost portion of the sculpture.

To enable the reader to judge of the agreement of the three inscriptions, I have added to Plate XXIX., since it has been engraved, marginal references, to point out the corresponding sheets of the Delhí inscription. I have also marked all the variations, omissions, and redundances that occurred on a careful comparison of the two texts, omitting only the mere errors of vowel marks, the correction of which would have confused the already painful closeness of the writing. Considering that the Bettiah inscription was taken down by a native artist, the errors of copying do not appear to be very numerous. There are more considerable discrepancies found on collating the Allahabad transcript of Lieut. BURT, with the original from Delhí, owing no doubt to its dilapidated condition. It is a fortunate circumstance that the Delhí sculpture remained in so perfect a state of preservation, when it was first discovered and examined by the English. It seems moreover to have been most carefully taken down by Captain HOARE.

On referring to my former note on the Allahabad column it will be remarked, that most of the anomalous letters, which I had thrown out of the classification of this alphabet in Plate V., are, on comparison with the other texts, now reduced into simple and known forms. A few other remarks that occurred on passing my eye carefully over the whole three inscriptions, may perhaps help in determining the value of some of the letters.

1. I asserted on that occasion that there appeared to be no compound letters:—several very palpable instances however occur in the Bettiah inscription, of double letters substituted for two single ones in the Delhí column. These are as follows:

In the fourth line of the Bettiah version **Ꞥ** is found to be substituted for **DJ** of the Delhí text. In the first line the same substitution

is made, with the addition of one of the vowel marks,  $\text{॒}$  for  $\text{॒॒}$ . In the eleventh line  $\text{॒}$  occurs for  $\text{॒॒}$  : in the thirteenth,  $\text{॒}$  for  $\text{॒॒}$  : in the 28th, we find  $\text{॒}$  taking the place of  $\text{॒॒}$  : and the same contracted form occurs also in the Allahabad version (vide scheme of Alphabet, Plate V.) The commonest double letter however in both these two texts is  $\text{॒॒}$ , which corresponds with  $\text{॒॒}$  of the original or Delhi column.

Other contractions of less certainty may be remarked in the body of the inscriptions : for instance,  $\text{॒॒}$  for  $\text{॒॒}$  ;  $\text{॒॒}$  for  $\text{॒॒}$  ;  $\text{॒}$  for  $\text{॒॒}$ . It is probable also that  $\text{॒}$  and  $\text{॒}$ , are contractions of  $\text{॒॒}$  and  $\text{॒॒}$ , though this is not borne out, like the others, by actual example of the separated letters.

2. From the frequent and almost exclusive occurrence of  $\text{॒}$  as the secondary consonant in the above enumeration of double letters, as well as from its resemblance in form to the corresponding letter of the Gya alphabet (No. 2, see Plate VI.), I think a strong probability is established that this letter is equivalent to  $y$  or  $\text{॒}$  of the Deva Nágari alphabet.

The other subjoined letter has a great analogy to the Sanscrit  $\text{॒}$ . The letter, with which these two are most frequently united, may with equal probability, be set down as equivalent to the Deva Nágari  $\text{॒}$ , whence the compounds may be pronounced to be  $\text{॒॒}$  and  $\text{॒॒}$ , the two perhaps of most common occurrence in the Sanscrit language.

3. The letters  $\text{॒}$  and  $\text{॒}$  are found to be frequently interchangeable in the inscriptions ; corresponding in this respect to the  $\text{॒}$  and  $\text{॒}$  of the Nágari alphabet, and strengthening the assumption just made.  $\text{॒}$  and  $\text{॒}$  are also very commonly confounded, and it is most probable that they are the same letter. The triangle (No. 28 of the alphabet in Plate V.) of the Delhi inscription, is invariably represented by the half-moon letter  $\text{॒}$  (No. 13) in the Bettiah Láth, and therefore the former may be erased from the alphabet : the anomaly of the same character, shaped like the letter  $V$ , proves on comparison to be the same letter as the foregoing.

4. The letter  $\text{॒}$  (No. 14 of the alphabet) is very commonly omitted in the Láth of Bettiah, especially when it occurs before No. 24. This character also is subject to no vowel inflections ; its variations of form though numerous prove to be merely accidental.

5. In the Delhi text as printed in the Asiatic Researches the words are separated from each other, according to the European fashion. This circumstance is of great consequence, (especially as it is not observable in the other two transcripts,) because it enables us to form



some notion of the terminations and inflections of the words. Thus where we perceive an instance, (and many such occur,) of five or six consecutive words ending in the same letters, we may fairly presume them to be connected in case and gender, like the long compound epithet of the second inscription described by Dr. MILL, (p. 260.)

6. The characters most often forming the termination of words in the Delhi text, are **𑂦** and **𑂧**, of both of which upwards of 40 instances occur. Next to them in frequency, come **𑂨**, **𑂩**, and **𑂪**, about 20 of each: then **𑂫** and **𑂬**, **𑂭** and **𑂮**, about a dozen each: the other letters are comparatively rare as finals. It may be remarked, that the vowel inflection, which has been set down as *é*, is affixed to most of the final consonants, affording another argument in favor of the language being Sanscrit.

\* 7. The order in which the inscription should be read is wrongly given in Captain HOARE'S plates, where he makes the east portion follow that of the north. That the north is the proper commencement is proved by its being the uppermost of the Allahabad column; then follow the west, the south, and the east respectively.

For convenience of reference, I may here remark, that the first eight lines of the Allahabad Láth inscription include to the third letter 19th line, Plate X., Asiatic Researches, vol. vii. They are here cut off by the Persian inscription. The following half line, partially clipped on the upper surface of the letters, begins with the eleventh letter of the fourteenth line, Plate XIII. of Delhi. The next three lines finish the same plate; but three letters are missing from the beginning of each line (owing probably to the peeling of the stone).

The three following lines (13, 14, 15,) correspond with the commencement of Plate XII., and also with the uppermost part of the Bettiah inscription in the present plate; the three or four initial letters of each line are here also cut off by some accident.

Line 20 of Allahabad begins with the sixth letter of Plate XI. of Delhi, and the detached portions of the neighbouring lines may easily be found in their respective places.

In the second half of the Bettiah inscription (which should come first in the order of reading), one circumstance tends very much to perplex the comparison with that of Delhi, which is, that from the last letter of the 20th line onwards, the native copyist (at least I imagine the fault must be his) has transposed every half line of the text, placing *first* what by the Delhi column should be the *last* half of each line. This defect I have attempted to correct by placing intermediate figures over the first letter of each transposed passage: thus, the

order of the figures being now in the engraving 12, 13½, 13, 14½, 14, &c., the order in which the text should be read to make it agree with the Delhi text is, 12, 13, 13½, 14, 14½, and so on in the natural progression of the figures.

These circumstances prove how very important has been the discovery of the identity of the three inscriptions; for when to the numerous errors of copying, is superadded the perplexing transposition in a complicated manner of one half of the inscription now before us, we may readily imagine the almost insuperable difficulties it would have presented to a translator, even had he a perfect acquaintance with the alphabet and language! The case is now very much altered, and those who have the desire to signalize their learning and ingenuity by decyphering the purport of the document, may go to work with perfect confidence, that by collation of the three manuscripts, he can provide himself with a faithful copy of the original type. Whoever also undertakes to make a facsimile of the other inscriptions stated by Mr. HODGSON to exist in Behár and Nepal, should have a copy of the corrected version before him, that he may note the variations as he proceeds.

Of the origin and nature of these singular columns erected at places so distant from each other as Delhi, Allahabad, Bettiah and Patna, all bearing precisely the same inscription (as far as the unknown character is concerned), I will not venture to offer any speculations. Whether they mark the conquests of some victorious rájá;—whether they are as it were the boundary pillars of his dominions;—or whether they are of a religious nature, bearing some important text from the sacred volumes of the Bauddhists or Brahmins, can only be satisfactorily solved by the discovery of the language, and consequently the import these curious monuments are intended to convey. The new facts now brought to light, will I hope tend to facilitate this object, especially the discovery of the double letters which, added to the mode of forming the vowels, leaves little doubt that the alphabet is a modification of Deva Nágari, and the language Sanscrit\*, as suggested by Mr. HODGSON.

\* After sending the above to the press, I was favored with an interesting communication from the Rev. Mr. STEVENSON, a distinguished Orientalist, well known as the author of the *Maharashtra Grammar*, on the *Ancient Inscriptions in the Caves of Carli*, which is inserted as Art. IV. of the present number. Although I am not prepared to confirm in toto the scheme of Mr. STEVENSON'S alphabet, since when applied to the Allahabad inscription, it does not convert the context into intelligible Sanscrit,—it is most satisfactory to find that many of his equivalents for the ancient letters are the same as those to which the discovery of the double letters above described has led myself; affording thus, a stronger argument in favor of their being correctly interpreted. Of these it is only necessary to mention the *s* and the *y*, of which we may now be quite certain. One more effort by a competent Pandit, with the aid of Mr. STEVENSON'S labours, will

III.—*Second Note on the Bhilsá Inscription. By the same.*

An original facsimile of the inscription in the neighbourhood of *Bhilsá*, to which the foregoing note of Mr. HODGSON also alludes, was fortunately in his own keeping, and was transmitted to me for the purpose of having an accurate copy transferred to copper-plate. This has been done in Plate XXVIII. with the greatest care and fidelity, but still with little success as to useful result, further than the certainty now acquired that its character is the same as that of the Allahabad column No. 2, which from the circumstance of its occurrence on all the gold Kanouj coins, we may properly distinguish by the title of “*Kanouj Nágarí.*” There is however a considerable admixture of the more ancient character, so much so that the period of its sculpture might seem to form an intervening link in the history of the two alphabets.

None of our orientalist have yet been able to make any thing of the *Bhilsá* or *Sánchí* inscription, although they are far from abandoning their attempts to decypher it. I am perhaps to blame in exhibiting it prematurely to the world before it has been read, but I justify myself in the reflection, that the more it becomes known the better chance have we of a solution of the enigma. We may find duplicate and triplicate versions of part or the whole in other places, as in the remarkable example just brought to notice, and may thus correct dubious forms and render effaced ones legible. As the present inscription was a facsimile taken by compressing the paper on the surface of the stone, there can be no doubt of its exhibiting every impression precisely as it exists there; but every slight chip or flaw is also made manifest, and in a few cases the true letters may thus be rendered imperfect. On the whole, however, it appears very authentic, and only difficult to read from the rude execution of the stone-cutter’s chisel.

This inscription, it is known, belongs to a *Bauddha* edifice. A few months since Dr. SPILSBURY sent us a native drawing of the sculpture on one of the compartments of the same monument, which puts the matter beyond doubt; for it represents the consecration of the *chaitya* or *dehgope* by a procession of nobles, priests, and votaries. This curious drawing is engraved in Fig. 1, Plate XXVII. It is much to be wished that some amateur artist would pay a visit to the spot, and bring away accurate drawings of the whole details of this highly interesting object doubtless unravel the whole mystery of the pillar inscription. It might, perhaps, be deemed by some more prudent to make this attempt before publishing the present notice; but, it is precisely because I have not the necessary acquaintance with Sanscrit myself, that I desire to make known generally the progress and results of fortuitous discoveries, which may be of service to others in their investigation of the inscription. J. P.

of antiquity. One addition to its elucidation chance has enabled me to contribute.

The late Mr. S. V. STACY picked up at auction some original sketches of architectural monuments in central India, signed “ROEBUCK, 1819.” Most of them are without any memorandum to explain to what monuments they belong: but one of them fortunately bears the title “Plan of the Jain or Buddhaic Building at Sauchee Kanikhéra, on the west bank of the Betwa near Bhilsá, called ‘*Sas buhoo ka Bittha.*’” From the hand writing I should judge that the sketch must have been prepared by the late Dr. YILD, apparently for the guidance of some person about to visit the spot, probably Captain FELL. I have introduced the plan and elevation in Plate XXXI. as an appropriate accompaniment to the preceding plates. Some of the marginal notes are worthy of being transcribed:

“In visiting this place, remember also to inquire for some buildings at a place called *Jhinmah ka puhar*, three miles to the north-west of Oodygiri.” “There is also an unfinished figure of a horse and a recumbent figure on an adjacent hill in the direction marked M.” “The arrow H points in the direction of Oodygiri, where there is a rock with some curious sculpture, and apparently the quarry whence the stone of the present building was derived.”

“K points to a temple containing an image of *Buddha*.

L, to another of a similar nature, 200 yards off.

N, to a smaller temple.

A is the site of a pedestal imbedded in a square basement: near which lie the broken parts of a large image.

B, B, and B are three images of *Buddha* within the enclosure.

C is a standing figure, with a smaller figure having curly hair, on his left hand: resting on an elephant on the right.

D is a large broken pillar, the sum of the pieces exclusive of the capital, forming originally a single stone, measure 31 feet 10 inches.”

Whether or not this sketch was prepared for Captain E. FELL, it agrees precisely with the description published by him in the *Calcutta Journal* of 11th July, 1819. This account has not appeared in any work of a more permanent nature, nor is it alluded to by Mr. ERSKINE in his *Dissertation on the Bauddha monuments of India*, in the *Bombay Transactions*. I shall therefore make no apology for reprinting it from *BUCKINGHAM'S Journal*, and if hereafter I am favored with any further drawings of the antiquities in its neighbourhood, they shall be added to the present plates. Captain FELL talks of ‘numerous inscriptions,’ especially one which gives the date of the erection, in *Samvat* 18, or 40 B. C.

This point requires to be confirmed by a facsimile of the document before it can be credited. If it were possible to perforate the structure without injury, some coins might probably be found deposited in the interior which would better serve to determine its antiquity.

*Description of an ancient and remarkable Monument, near Bhilsá.*

On the table-land of a detached hill, distant from Bhilsá four miles and a half, in a south-westerly direction, is an ancient fabric, of a hemispherical form, built of thin layers of free-stone, in the nature of steps, without any cement, and to all appearance solid; the outside of which has been faced throughout with a coat of chunam mortar, four inches thick; most of this still remains in perfect preservation, but in one or two places a small portion has been washed away by the rain.

The monument (for such I shall term it) is strengthened by a buttress of stone masonry, 12 feet high and 7 broad, all around the base, the measured circumference of which is 551 feet. The diameter of the superior surface is 35 feet, the ascent to which is easy by the assistance of the projections of the different layers. Originally it was crowned with a cupola, supported by pillars; but the cupola is now split, and lies, as well as the pillars, on the top. A line drawn from any given point of the base to the centre of the crown measures 112 feet.

The weight, together with the age and extent of the structure, has forced a portion of the buttress to jut out and give way, by which I had a fair opportunity of fully determining that no cement has been used in the interior of it.

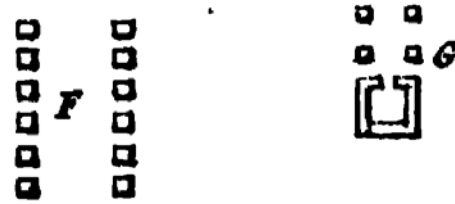
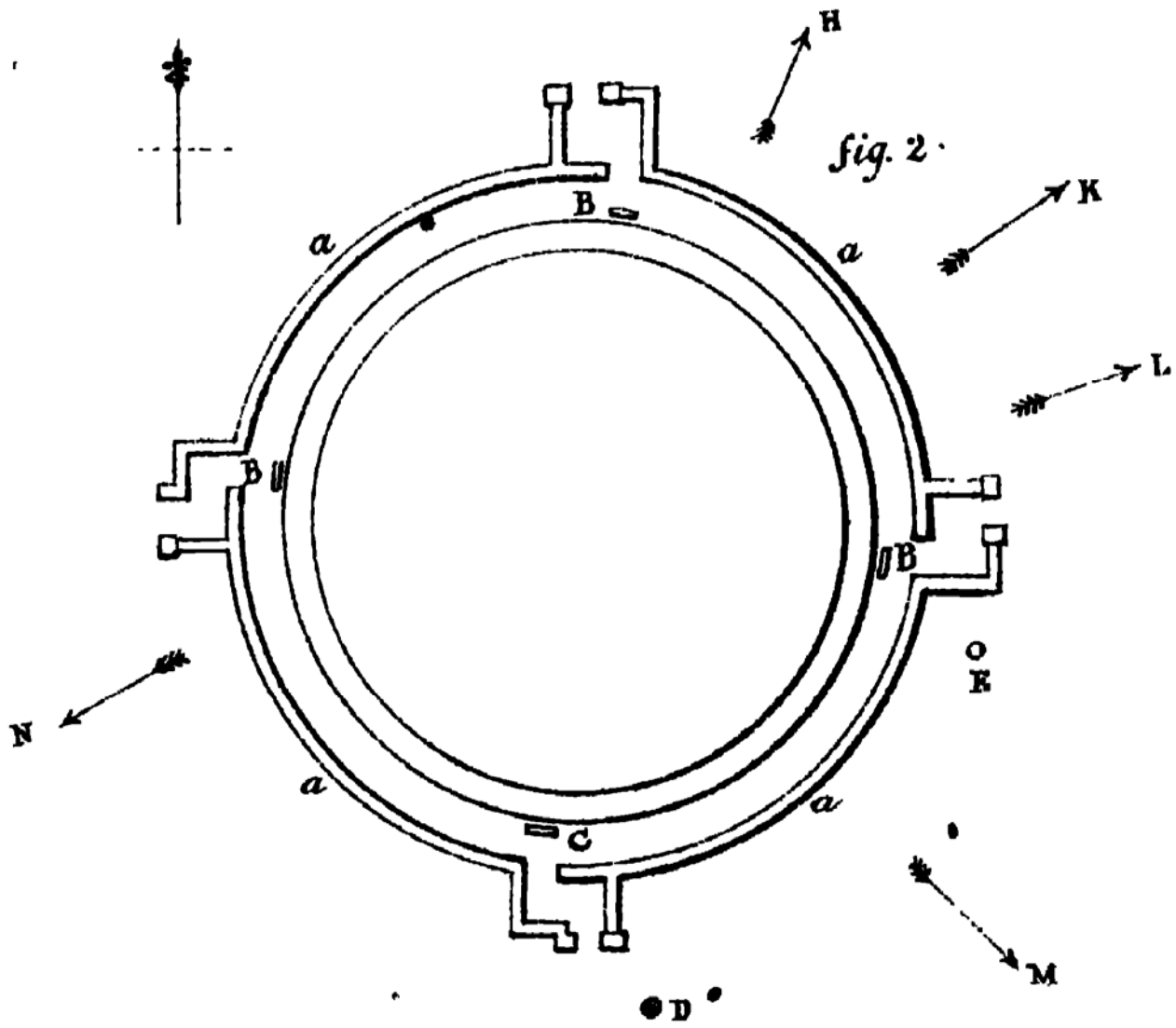
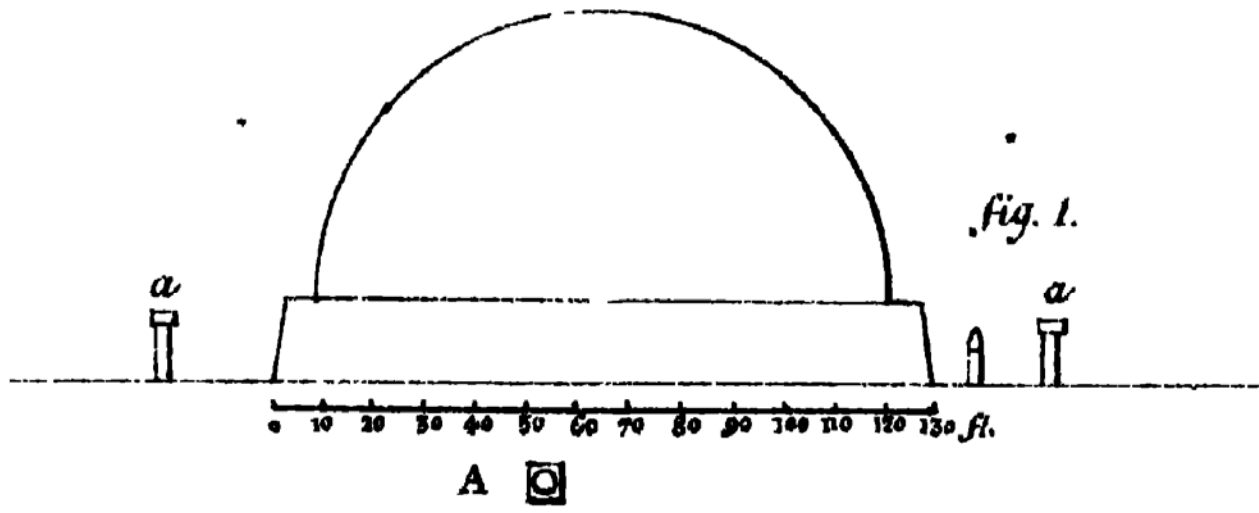
From the different buildings near it having fallen into decay, whilst this stands entire, together with its immense extent, which would rather aid dilapidation than otherwise, I am induced strongly to suspect (enforced by the general impression the structure made upon me whilst examining it, and an aperture appearing in every representation of the monument, sculptured in the different compartments of the gate-ways, and even on detached stones), that it is supported by internal pillars. If so, apartments undoubtedly exist within, highly interesting, and worthy of being further examined. Indeed when you view so large a mass of stone, placed in such neat order, without any cement in the interstices, it must forcibly strike the most superficial observer, that inner supporters were requisite to its completion, and were undoubtedly used in the construction.

This point could not be ascertained without much time and labour, and would require also, I presume, the acquiescence and countenance of the Nawáb of Bhopál, in whose territory it is situated; but I conceive that no hesitation would be made to this on the score of its creating jealousies, as the monument is of a nature which prevents the orthodox Hindu from visiting it, and the Jainas, as well as every other class, have become totally indifferent regarding it.

As dilapidation has commenced, the ravages of a few years, most probably, will cause the whole to fall into a mass of ruin, destroying the inner apartments and images, if any, and thus for ever depriving the curious from knowing what so wonderful a monument of human genius contains.

It is surrounded by a colonnade of granite pillars, 10 feet high, distant from each other a foot and a half, connected by parallels also of granite, of an elliptical form, united by tenons, leaving an area of 12 feet clear of the base of the monument, to which it strictly conforms.

*Section and Plan of the Buddhist Monument, at Sanchee, on the west bank of the Betwa river near Bhilsa.*



*a a a, railing  
 A, Pedestal and broken image  
 B,B,B, Images of Buddha.  
 C, Ditto with elephant.  
 D, Broken pillar 32 ft. high.*

*E, Small polished pillar.  
 F; Ruins of a hall.  
 G, Small temple.  
 H,K,L,M,N. Rearings of other temples &c.*



At the east, west, and north points, are gate-ways, plain parallelograms, the extreme height of each of which is 40 feet, and the breadth within the perpendiculars, 9 feet. They all measure 20 feet to the lintels, which are slightly curved and sculptured, with circlets of flowers. In the northern gate-way, which is the principal one, the lintel rests on elephants, four feet in height, richly caparisoned, borne by a projecting cornice, 16 feet from the base. The perpendiculars are divided into four unequal compartments; in the lower are statues of door-wardens, in long loose drapery, the left hand of each figure resting on the left side, and the right grasping a battle-axe; their head dresses are not unlike the matted-hair tiara of Hindu devotees, with the top-knot thrown forward.

The other divisions are filled as follows: In one is a groupe of females, some sitting, others kneeling in homage to a tree and altar, their hands uplifted, and faces towards the tree, their countenances bearing marks of extreme devotional fervour. In another, the principal figure is a male, clothed in a long flowing garment, resembling a surplice, standing with joined hands, and in the act of adoration to the tree and altar, which throughout the sculpture appear to be the objects of veneration. This male figure is attended by females, some holding umbrellas over his head, others using chowries; above these, on a level with the top of the tree, are small winged figures, making offerings in censers.

The drapery throughout the groupe is generally, for the females, a long flowing vest, resembling that which we observe in Grecian sculpture; that of the males, light lower garments from the navel as far as the middle of the thigh, tied with a knot in front, and hanging down as low as the instep, as in the present Indian mode of dressing. The upper part of the body is naked, without any mark of a sacerdotal thread; and, with a very few exceptions, the head dress is a high turban, with plumes.

In another compartment is a representation of the monument, surrounded by figures in groupes, some standing, others sitting cross-legged, others bowing, all with joined hands, and in the act of worship. On the monument, and resting on a square pedestal, are three tiers jutting out beyond each other, crowned by a lofty umbrella, supported by small winged figures, naked, their hands joined, and heads covered with numerous serpent hoods.

On entering the different gate-ways, is seen a statue of Buddha, as large as life, seated cross-legged on a throne, which is supported by lions couchant; the back of the image rests against the buttress, and has attendants on both sides using chauris. All of these are much mutilated, and one is removed and thrown across the area.

The perpendiculars of the western gate-way, are also divided into four unequal compartments; in the lower are statues of door-keepers, one of whom is armed with a mace: his head dress, a helmet, without visor or plumes; another division is filled with groupes of figures sitting cross-legged, and standing, their hands joined, and all paying high homage to the sacred tree and altar. In another is a small convex body in a boat, the prow of which is a lion's head, and the stern the expanded tail of a fish, over which is suspended a long cable. In the boat are three male figures, two of whom are rowing, and the third holding an umbrella over the convex. The vessel is in an open sea, in the midst of a tempest; near it are figures swimming and endeavouring by seizing piles, &c. to save themselves from sinking. One on the



point of drowning, is making an expiring effort to ascend the side ; the features of all fully pourtray their melancholy situation.

In another compartment is the sacred tree and altar, surrounded by groupes of figures, both male and female, some beating tympana, others playing cymbals, others dancing ; the winged figures before described attend above the groupes. The lintel of this gate-way is borne by the uplifted hands of five uncouth dwarf figures, five feet high, with thick lips and flat noses, their hair curly, and having large protuberant bellies, appearing as if on the point of being crushed beneath the immense burthen they are supporting ; in short, it is hardly possible to conceive sculpture more expressive of feeling than this.

A representation of the grand monument fills another compartment of one of the perpendiculars. (See plate xxvii.)

The eastern gate-way is of the same dimensions as the others, with door-wardens armed with maces. Two of the compartments in each perpendicular comprise a procession leaving the gates of a city in progress to the tree and altar, near which is a human being, his hands strongly corded above the wrists, and held by another. The procession consists of horsemen, footmen, elephants, and short-bodied cars, drawn by horses : the latter crowned with plumes, all highly finished. The head-dress of the figures seated on the cars is the Roman helmet, with the plumes and hair. The whole is preceded by footmen, armed with circular shields and clubs, followed by a band of musicians playing flutes. The head-dress of the groupe running by the side of the cars differs from that of all others, being a closely-fitting turban of circular folds, most exquisitely delineated, on the top of which is a small globular crown.

Another compartment is filled with figures of devotees of different orders, performing various penances. In another division are three figures, with long beards, (the only figures of this description seen throughout the whole building,) seated in a boat in an open sea, at the bottom of which are seen various kinds of shells, alligators, &c. Underneath the ocean, and as if supporting it, are three male figures, and one female, the central male figure with uplifted hands, and his back outwards, the female in the act of praying to him. The whole of this groupe are clad in long loose vests, and the head-dresses of the males resemble mitres. On both sides of the groupe are the winged figures, the tree, and altar.

The lintel of this gate-way is supported by elephants, richly caparisoned, and resting on projecting horizontal cornices.

The capitals of the several gate-ways are crowned by figures of lions, elephants, naked and clothed statues, and images of various birds and beasts.

On the south, there is a plain entrance, near which is a double colonnade of quadrangular pillars, 20 feet high, most curiously set up, and forming an almost oval apartment. Near this lies a large obelisk, in circumference nearly equalling the Láth of FÍROZ SHÁH, near Delhi. On the part which is uppermost, I could not observe any inscription ; it is worked with a string of flowers.

At the door of the apartment above mentioned, is the lower part of a statue of Pársvánáth, smaller than those of Buddha in the gate-ways, resting on a throne which is supported by lions couchant on a pedestal, on which is an inscription, but so much obliterated, that I could make nothing of it, although the few letters that partially remain are Sanscrit. Near this is also a pillar, 14 feet high and  $3\frac{1}{2}$  in circumference, crowned with lions and tigers.

In front of and about 60 feet from the eastern gate-way, lie the shafts of two obelisks, about 10 feet in length, broken from the bases, which formed an entrance 14 feet in width ; on these I confidently expected to find an inscription, but was disappointed.

The whole has been surrounded by a stone wall, varying in distance from the monument, from 60 to 400 feet. It is 12 feet thick, and 8 feet high, built without cement ; at the four intermediate points were gate-ways, similar to but on a smaller scale than those in the colonnade around the monument.

The wall has fallen into general decay, and only one gate-way now remains, which is on the north-east.

In the upper compartments of the perpendiculars are female figures, naked and fettered, supporting on their heads a circle divided into 27 equal parts ; there are also figures holding snakes, standing close to a small relievo representation of the monument, in the body of which is a small aperture. This, as I have before said, serves to strengthen the opinion of apartments existing within. The lintel is slightly sculptured with circles of flowers in the same manner as in the others. It is supported by five uncouth dwarf images, with thick lips, curly hair, and their features expressive of the immensity of their burthens.

The upper parallels are beautifully sculptured with hooded serpents, passing through them in spiral wreaths. In that part of the outer hall which is still entire, are small flat-roofed apartments, 12 feet square, in most of which are large mutilated images of Buddha.

In a larger apartment, which stands opposite the eastern entrance to the monument, the roof of which is flat, and supported by a double row of granite pilasters, is a gigantic statue, the profile of the face measuring 13 inches from the fore-curls to the chin ; the nose and lips are much disfigured, and both arms are broken off below the elbows. This appears to have been more highly finished than any other. In the same apartment, on the right, is an image of Brahmá, with the sacerdotal thread, the front face mutilated ; the remaining, as well as all the tiaras, in excellent preservation. It measures three feet and a half from the throne, which is supported on two cobra capellas.

At the bottom, and in the centre of the supporters, which are diamond-cut, are alto-relievo figures of the Brahmínical order, their bodies thrown back in the act of attempting to avoid the heads of the serpents, which are not expanded, but projecting from under the throne, and turned as if endeavouring to ascend the columns.

On projecting pedestals, and in a line with the diadem, are small figures of Pársvánáth, cross-legged ; another also crowns the centre. This is the only statue of the Brahmínical mythology which I observed throughout the different subjects of sculpture. In a corner of the same apartment, is an image of Pársvánáth, over which are five expanded serpent-hoods, the only one which possesses this distinguished mark.

I was highly gratified at finding, on one of the pilasters, a Sanscrit inscription, with a date, which determined the structure to have been completed in the 18th year of the Samvat æra, or 40 years anterior to the birth of our Saviour.

There are numerous inscriptions on different parts of the colonnade around the monument, in a character almost totally unintelligible to me, though some of the characters are Sanscrit. I have taken fac-similes of a few.

About a quarter of a mile to the northward of this monument, is another, exactly similar to it in shape, but smaller, and built of free-stone, without any cement, each layer closely fitting, and not projecting over each other as in the former; neither has this been covered with a coat of mortar. It has a buttress, which measures round the base 216 feet; the diameter of the superior surface, 19 feet. It is in perfect repair, not a stone having fallen, and is surrounded by a colonnade of granite pillars, of the same description as that encompassing the large one, giving a clear area of 8 feet.

Almost every stone of this bears an inscription in characters similar to each other; there is no sculpture, nor gate-ways, but numerous stones lie strewed around in the vicinity of both monuments, being parts of columns, capitals, mutilated images of Buddha, pedestals, tablets covered with sculptured figures of horse-men, elephants, lions, and almost obliterated inscriptions, &c. There is no reservoir for water, nor a single well within the whole enclosure, nor on the hill; but there is a pukka tank, and several wells lined with masonry, about a mile from the monuments, both of which are undoubtedly coeval.

Any antiquary, skilled in research, would here find employment and amusement, for some time; even the taking fac-similes of the numerous old Sanskrit inscriptions that I observed, (and more would perhaps be found if sought for,) would occupy some days. I lament exceedingly my want of sufficient ability in the art of drawing, to do justice to the highly finished style of the sculptures; and also my deficiency in technical knowledge, and in experience in the power of description, for which these monuments afford ample scope.

These defects, together with the very limited time I possessed for inspection, will, I fear, render my account less satisfactory than I could wish: indeed I am fully aware my description can convey but a very faint idea of the magnificence of such stupendous structures, and exquisitely finished sculpture,—but as I know of no previous description of them that has been given to the world, I have been emboldened to send it you with all its imperfections on its head.

*Hasingabad, Jan. 31, 1819.*

E. FELL.

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#### IV.—*Inscription on the Iron Pillar at Delhi.*

Having prepared also in Plate XXX, an engraving of the inscription on the Iron Pillar at Delhi from a facsimile taken by the late Lieut. WILLIAM ELLIOT, of the 27th Regt. N. I., at the request of the Rev. Dr. MILL, I think it as well to insert it in this place, although unprepared to give any account of its contents. Many of the letters agree with those of the Canouj alphabet, but the general aspect of them, I think, has greater conformity to the classical Deva Nagari.

Those who are acquainted with Sanscrit are invited to aid in decyphering it. The first few letters appear to contain figures, probably conveying the date of the monument.

J. P.

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Inscription on the Iron Pillar at Dobbi, taken by Lt. Wm Elliot. 1831.

ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।  
ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।

ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।  
ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।

ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।  
ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।

ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।  
ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।

ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।  
ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।

ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।  
ॐ नमो भगवते वासुदेवाय । श्रीगणेशाय नमः ।

J Printers reduced



V.—*Restoration and Translation of some Inscriptions at the Caves of Carlí, by the Rev. J. STEVENSON.*

[In a letter to the Secretary, read at the Meeting of the 5th Nov.]

I have the pleasure to send you a copy of some of the inscriptions engraved on the excavated temple at Kárlí, near Puná (Poonah), along with an alphabet for decyphering them, and a translation.

It is now about a year since I first began to search, among the learned natives of this place, for a key to these inscriptions; but I was provokingly sent by the Marathás to the Kánarese, and by them again to the Támulians, and so on, without any result in an endless succession. I then made a collection of all the alphabets used on this side of India, and made the attempt, through means of them, to decypher the inscriptions; but still with no encouraging success. While engaged in these attempts, happily the March No. of your Journal was sent me by a friend, and through the aid it afforded me, in furnishing me with the alphabet of Inscription No. 2, on the Allahabad Pillar, with some little assistance from the sources above mentioned, I have been able to decypher some of our inscriptions; and hope that if you have not found the key to the character of Inscription No. 1, my alphabet may carry you several steps towards its attainment, and so repay the debt I owe for the assistance derived from your Journal.

Indeed I think the first 13 letters on the Allahabad stone, repeated again in lines 5th and 8th, and several times on the Delhi pillar, may, without much difficulty, be read as containing an address, probably to the Sun, in pure Sanskrita, as follows: *द्वेषारं पिथे पिय इमेभार्जमेदं* which perhaps may be translated as follows:—"In the two ways (of wisdom and works?) with all speed do I approach the resplendent receptacle of the ever-moving luminous radiance." "I do not however enter farther upon the decyphering of the inscriptions, found on the banks of the Ganges. Many important duties prevent me from allotting much time to studies of this nature, and the time I can spare for such a purpose, will be better spent in endeavouring to illucidate the history of the Dakhan (Deccan), from the numerous inscriptions in this, and the other ancient character, which are to be found up and down the country; assured, that the learned in Calcutta will soon reveal to us whatever mysteries the Allahabad and Delhí pillars conceal.

The inscriptions marked (A) (B) and (E), are in a letter of a different cast, and of about twice the size, of the others; and I almost fancy them somewhat more modern than the construction of the cave: but

the others, from the position they occupy, the apparently more ancient cast of the letter, and the damage they have sustained from time, are evidently coeval with the excavation of the temple. The other inscriptions on the temple, which I have not sent you, are all more or less imperfect, and are retained at present for farther investigation ; as is also an inscription found in an adjoining cave written in the same character as No. 2, of the Allahabad pillar. The inscription A is all contained in one line of about 12 feet long, and the height of each of the letters is about five inches.

I give you no description of the temple itself, as I am informed that a particular description of it, will soon be published in the Transactions of the Royal Asiatic Society of London. It seems only necessary to say, that the images inside are all of the Buddhist class, while on the outside, the Buddhist and Bráhmancial are intermixed with one another.

From the inscriptions already decyphered, the following facts may, I think, be gathered.

1st. That the temple in question was excavated sixteen and a half centuries ago. The inscription (E), which contains the date, seems coeval with the sculptured images, and though in several places a little defaced, that part of it which contains the numeral figures, and a few letters both before and after, are happily in a state of perfect preservation. In order that no doubt might rest on this important point, I kept the inscriptions by me for two months, after decyphering them, and at last made a journey in the midst of the rains to the place, in order to ascertain whether or not my friend Lieutenant JACOB had copied them with perfect accuracy, before mentioning publicly the discovery I had made. The result of that examination was quite satisfactory, and left a full conviction on my mind, that there would be no doubt about the numeral figures. As to the era being any other than that of SHÁLIVÁHÁNA, though that is not quite clear from the inscription taken singly, the mention of one of his successors by the unambiguous title, of " Ruler of the Shakas," in an adjacent inscription, of the same cast of letter, carries this point also beyond all reasonable doubt.

2nd. It seems evident that SHÁLIVÁHÁNA's empire in the Dakhan, continued in great splendour, in the persons of his successors, for at least a hundred years after the commencement of his era, as is plain from their executing works of so much labour and expence.

3rd. It would appear, that the Buddhist was the religion at that time most favoured by the ruling party, though the Bráhmans, probably from their extensive influence among the lower orders, were thought of sufficient consideration, to have some of their images admitted into the society of the deified sages.

4th. That the Shakas did not come in numbers sufficient to supplant the language or literature of the Brahmans, whose learned language, the Sanskrita, they adopted to carry the memory of their deeds down to posterity.

5th. That since a character much simpler, and less artificial than the Deva Nágari, was in use for writing the Sanskrita language over all the western parts of India, it, and not the Deva Nágari, was, most probably, the character in which the Vedas, and most ancient compositions of the Hindus, were first committed to writing; and should those writings ever be carefully studied, and need conjectural criticism, this ancient character will also require to be studied.

6th. That the Arabic numeral cyphers had been introduced into India at the period above mentioned. The figure for one, and the two zeros in inscription E, are formed very nearly as they are formed in the Dakhan at the present day, and are united by a kind of hyphen as is still customary.

7th. That great caution must be exercised in admitting local traditions, in regard to such distant times. The universal tradition among the inhabitants of the Dakhan is, that all these caves were formed by the sons of PA'NDU, when in banishment, wandering about the country; and I was at first inclined to believe, that when the Pándavas came to power, they might so perpetuate the memory of the places of their former retreat; but the temple at Kárlí belongs to a much later era, as we have seen, and probably the same is the case with those also at Verúl, (Ellora,) some of which greatly resemble it. The truth is, that it would be too much for modern Bráhmans to allow, that those who rejected the divine authority of the Vedas, could perform works, which the orthodox Hindus of modern times cannot equal, even though it should be at the expence of making the Pándavas encouragers of atheism.

I make no remarks on the proper names of kings, in the inscriptions, as I do not know that we have any lists of the descendants of SHA'LI-VA' HANA, that can be depended on. In proper names where the letters are not perfectly distinct, doubt must remain, from the absence of all aid from the construction and context.

That your efforts for the promotion of science may be still more and more instrumental in clearing away the mists with which the Hindus have enveloped the history of their nation, and become the means of arousing many of them also to the zealous pursuit of true knowledge, is the ardent wish of

Your obedient servant,

Poona, 17th Sept. 1834.

J. STEVENSON.

[The inscriptions will be found in the following page.]





(D) Where the man-slaughtering demon Old-Age, of immense power, and muttering hoarsely, might, formerly, frantic, roam amid the horrid world-destroying devils, there, during the currency of the year of the prosperous cherisher of the world, (SHA'LIVA'HANA) 100\*, this mountain-topping, hell-opposing, divine hermitage [was constructed], that the assembly of the illustrious immortals, and every noble and pious personage, might there take up their abode.

(E) Blessings attend thee. O Devotee, of an auspicious spiritual mind, having an unimpeded utterance, who art purified, and sound in all thy members; thou who art journeying towards our Supreme Lord, thou art now approaching the door.—Blessings attend thee.

[Mr. STEVENSON has, since the type for the above was cut, favored me with a lithographic copy of the same inscriptions, which differs in one or two trifling forms from the above. The transcript in Nágari has been corrected by the lithographic version.—J. P.]

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VI.—Remarks on M. Remusat's Review of Buddhism. By B. H. HODGSON, Esq. Resident at the Court of Népál, &c.

I resume my notice of REMUSAT'S speculations on Buddhism in the Journal des Savans.

He observes, “ On ne seroit pas surpris de voir que, dans ce système, la formation† et la destruction des mondes soient présentés comme les resultats d'une révolution perpetuelle et spontanée, sans fin et sans interruption ;” and afterwards remarks, “ Il y a dans le fond même des idées Bouddhiques une objection contre l'éternité du monde que les theologiens de cette religion ne semblent pas avoir prévue. Si tous les êtres rentroient dans le repos réel et définitif à l'instant que les phénomènes cesseroient et disparoistroient dans le sein de l'existence absolu, on conçoit un terme ou tous les êtres seroient devenus Buddha, et ou le monde auroit cessé d'exister.”

This Buddha, it is said, is “ l'intelligence infinie, la cause souveraine, dont la nature est un effet.”

Now, if there be such a supreme immaterial cause of all things, what is the meaning of alleging that worlds and beings are *spontaneously* evolved and revolved? and, if these spontaneous operations of nature be expressly allowed to be *incessant and endless*, what becomes of the apprehension that they should ever fail or cease?

As to the real and definitive repose, and the absolute existence, spoken of, they are as certainly and customarily predicated of *Diva natura* by the Swabhávikas, as of God or Adi Buddha, by the Aiswárikas; to which two sects respectively the two opposite opinions confounded by REMUSAT exclusively belong.

\* A. D. 176.

† The question of formation is a very different one from that of continuance. Yet REMUSAT would seem to have confounded the two. See the passage beginning “ Mais ce qui merite d'etre remarqué.”

Again, " Tout est vide, tout est delusion, pour l'intelligence suprême (Adi Buddha, as before defined). L' Avidyá seul donne aux choses du monde sensible une sorte de réalité passagère et purement phénoménal." Avidyá, therefore, must, according to this statement, be entirely dependant on the volition of the one supreme immaterial cause : yet, immediately after, it is observed, " on voit, à travers des brouillards d'un langage énigmatique, ressortir l'idée d'une double cause de tout ce qui existe, savoir l'intelligence suprême (Adi Buddha) et l'Avidyá ou matière." But the fact is, that Avidyá is not a material or plastic cause. It is not a substance, but a mode—not a being, but an affection of a being—not a cause, but *an effect*. Avidyá, I repeat, is nothing primarily causal or substantial : it is a phenomenon, or rather the sum of phenomena ; and it is " made of such stuff as dreams are." In other words, phenomena are, according to this theory, utterly unreal. The Avidyálists, therefore, are so far from belonging to that set of philosophers who have inferred two distinct substances and causes from the two distinct classes of phenomena existing in the world, that they entirely deny the justice of the premises on which that inference is rested.

REMUSAT next observes, " Les effets matériels sont subordonnés aux effets psychologiques"—and in the very next page we hear that " on appelle lois les rapports qui lient les effets aux causes, tant dans l'ordre physique que dans l'ordre moral, ou, pour parler plus exactement, dans l'ordre *unique*, qui constitue l'univers."

Now, if there be *really* but one class of phenomena in the world, it must be either the material, or the immaterial, class : consequently, with those who hold this doctrine, the question of the dependence or independence of mental upon physical phenomena, must, in one essential sense, be a mere façon de parler. And I shall venture to assert, that with most of the Buddhists—whose cardinal tenet is, that all phenomena are *homogeneous*, whatever they may think upon the further question of their reality or unreality—it is actually such.

It is, indeed, therefore necessary " joindre la notion d'esprit" before these puzzles can be allowed to be altogether so difficult as they seem, at least to be *such* as they seem ; and if mind or soul " have no name in the Chinese language," the reason of that at least is obvious ; its existence is denied ; mind is only a peculiar modification of matter ; et l'ordre unique de l'univers c'est l'ordre physique ! Not 50 years since a man of genius in Europe declared that " the universal system does not consist of two principles so essentially different from one another as matter and spirit ; but that the whole must be

of some uniform composition; so that the material or immaterial part of the system is superfluous."

This notion, unless I am mistaken, is to be found at the bottom of most of the Indian systems of philosophy, Brahmánical and Buddhist, connected with a rejection in some shape or other of phenomenal reality, *in order to get rid of the difficulty of different properties existing in the cause (whether mind or matter) and in the effect\**.

The assertion that "material effects are subordinate to psychological" is no otherwise a difficulty than as two absolutely distinct substances, or two absolutely distinct classes of phenomena, are assumed to have a real existence; and I believe that there is scarcely one school of Bauddha philosophers which has not denied the one or the other assumption; and that the prevalent opinions include a denial of both. All known phenomena may be ascribed to mind or to matter without a palpable contradiction; nor, with the single exception of extent, is there a physical phenomenon which does not *seem* to countenance the rejection of phenomenal reality. Hence the doctrines of Avidyá and of Mayá; and I would ask those whose musings are in an impartial strain, whether the Bauddha device be not as good a one as the Bráhmanical, to stave off a difficulty which the unaided wit of man is utterly unable to cope with?

Questionless, it is not easy, if it be possible, to avoid the use of words equivalent to material and psychological; but the tenet obviously involved in the formal subordination of one to the other class of phenomena, when placed beside the tenet, that all phenomena are homogenous, at once renders the former a mere trick of words, or creates an irreconcilable contradiction between the two doctrines, and in fact REMUSAT has here again commingled tenets held exclusively by quite distinct schools of Buddhist philosophy. •

If I have been held accountable for some of the notions above remarked on, I suspect that these my supposed opinions have been opposed by something more substantial than "des arguties mystiques." REMUSAT expressly says, "M. HODGSON a eu parfaitement raison d'admettre, comme base du *système entier*, l'existence d'un seul être souverainement

\* REMUSAT desired to know how the Buddhists reconcile multiplicity with unity, relative with absolute, imperfect with perfect, variable with eternal, nature with intelligence?

I answer; by the hypothesis of two modes—one of quiescence, the other of activity. But when he joins "l'esprit et la matière" to the rest of his antitheses, I must beg leave to say the question is entirely altered, and must recommend the captious to a consideration of the extract given in the text from a *European philosopher of eminence*. Not that I have any sympathy with that extravagance, but that I wish merely to state the case fairly for the Buddhists.

parfait et intelligent, de celui qu' il nomme Adi Buddha." Now, I must crave leave to say that I never admitted anything of the sort; but, on the contrary, carefully pointed out that the 'système entier' consists of *four* systems, all sufficiently different, and two of them, radically so—viz. the Swabhāvika and the Aiswārika. It is most apparent to me that RĒMUSAT has made a melange out of the doctrines of all the four schools; and there are very sufficient indications in the course of this essay that his *principal* authority was of the Swabhāvika sect.

In speaking of the two bodies of Buddha he remarks, that "le veritable corps est identifié avec la science et la loi. Sa substance même est la science (Prajná)." He had previously made the same observation, "Le loi même est son principe et sa nature." Now those who are aware that Prajnā (most idly translated law, science, and so forth,) is the name of the *great material cause\**, can have no difficulty in reaching the conviction that the Buddhist authority from whence this assertion was borrowed,—'of Prajnā being the very essence; nature, and principle of Buddha,'—belonged to the Swabhāvika school, and would have laughed at the *co-ordinate* doctrine of his translator, that Buddha is the sovereign and sole cause, of whom Nature (Prajná) is an effect.

The Swabhāvika Buddhas, who derive their capacity of identifying themselves with the *first cause* from nature, which is *that cause*, are as all-accomplished as the Buddhas of the Aiswārikas, who derive the same capacity from Adi Buddha, *who is that cause*.

In this express character of sovereign cause only, is the Adi Buddha of the Aiswārikas distinguishable, amid the crowd of Buddhas of all sorts; and such are the interminable subtleties of the 'système entier' that he who shall not carefully mark this cardinal point of primary causation, will find all others unavailing to guide him unconfusedly through the *various* labyrinths of the *several schools*.

Did RĒMUSAT never meet with passages like the following?

"And as all other things and beings proceeded from Swabhāva or nature, so did Vajra, Satwa, Buddha, thence called the *self-existent*,"

\* *Prakritésvari iti Prajnā*; and again, *Dhāranatmika iti Dharma*. *Dharma* is a synonyme of *Prajná*. *Prajná* means Supreme Wisdom. Whose? Nature's—and Nature's, as the sole, or only as the plastic, cause.

So, again, *Dharma* means morality in the abstract, or the moral religious code of these religionists, or material cause, in either of the two senses hinted at above; or, lastly, material effects, viz. versatile worlds. These are points to be settled by the context, and by the known tenets of the writer who uses the one or other word: and when it is known that the very texts of the Śwabhāvikas, differently interpreted, have served for the basis of the Aiswārika doctrine, I presume no further caveat can be required.

Even the Swabhāvikas have their Dhyāni Buddhas<sup>†</sup>, and their triad, including, of course, an *Adi Buddha*. Names therefore, are of little weight; and unmeasured epithets are so profusely scattered on every hand that the practised alone can avoid their snare. I did not admit a Theistic school, because I found a Buddha designated as *Adi*, or the first; nor yet because I found him yclept, infinite, omniscient, eternal, and so forth; *but* because I found him explicitly contradistinguished from nature, and systematically expounded as the efficient cause of all. Nor should it be forgotten that when I announced the fact of a Theistic sect of Buddhists, I observed that this sect was, as compared with the Swabhāvika, both recent and confined.

If, in the course of this, and the three preceding letters, I have spoken harshly of REMUSAT'S researches, let it be remembered, that I conceive my labours to have been adopted without acknowledgment, as well as my opinions to have been miserably distorted. I have been most *courteously* told, that "the learned of Europe are indebted to me for the name of *Adi Buddha!*" The inference is palpable that *that* is the extent of the obligation. Such insidious injustice compels me to avow in the face of the world my conviction that, whatever the Chinese and Mongolian works on Buddhism possessed by the French Savans may contain, no intelligible views were thence derived of the *general subject* before my essays appeared, or could have been afterwards, but for the lights those essays afforded\*. I had access to the original Sanscrit scriptures of the Buddhists, and they were interpreted to me by learned natives, whose hopes hereafter depended upon a just understanding of their contents. No wonder therefore, and little merit, if I discovered *very many things* inscrutably hidden from those who were reduced to consult barbarian translations from the most refined and copious of languages upon the most subtle and interminable of topics, and who had no living oracle ever at hand to expound to them the dark signification of the written word—to guide their first steps through the most labyrinthine of human mazes†.

For the rest, and *personally*, there is *bienséance* for *bienséance*, and a sincere tear dropped over the untimely grave of the learned REMUSAT.

\* The case is altered materially *now*, because my original authorities, which stand far less in need of living interpreters, are generally accessible. I have placed them in the hands of my countrymen and of others, and shall be happy to procure copies for any individual, or body of persons, in France, who may desire to possess them.

† I beg to propose, as an *experimentum crucis*, the celebrated text—*Ye Dharmaṁsīya* of the *Sata Samasriha*. If the several theistic, atheistic, and sceptical meanings wrapped up in these few words, can be reached through Chinese or Mongolian translations uninterpreted by living authorities, I am content to consider my argument worthless.

VII.—*On the Use of the Siddhantas in the Work of Native Education.*  
 By LANCELOT WILKINSON, Esq. B.M. C. S., Ast. Res. at Bhopál.

\*May I request that you will be so kind as to give insertion in your Journal to the accompanying few verses, extracted from the Goládhyāya, or Treatise on the Globes, by BHÁSKAR A'CHÁRYA, Hindu Astronomer, who flourished about 800 years ago.

In order to make the tenor of the arguments here used by BHÁSKAR A'CHÁRYA intelligible to readers generally, it may be proper in the first place, briefly to notice the popular belief and tenets entertained with regard to the earth and the system of the world, (for to these subjects my remarks will be confined,) by the two grand classes of Hindus here, so boldly and ably exposed by this celebrated Astronomer.

The Hindus of India seem to have been at the time when he wrote, as at the present day, divided into three grand classes; viz. 1st, the Jains or Bauddhas, followers of the Bauddha Sútras; 2nd, the followers of the Brahmánical or Puránic system; and 3rd, the jyotishis or followers of the Siddhantas or Astronomical system.

The Jains at that time maintained, and still maintain, that the earth is a flat plane of immense extent; that the central portion of it, called Jambudwíp, is surrounded by innumerable seas and islands, which encompass it in the form of belts; that the earth now is, and has been, since its first creation, falling downwards in space; that there are two suns, two moons, and two sets of corresponding planets and constellations; viz. 1st, for the use of that part of the earth lying to the north of the mountain Merú, believed to be in the centre of Jambudwíp, and the other for the use of the southern half of the world. The moon they believe to be above the sun, but only 80 yojans\*, Mercury, four yojans beyond the moon; and Venus, to be three yojans beyond Mercury. The Jain banyas, scattered through the cities and towns of Rájputáná, Málwá, Guzerát, and the north-west provinces of Hindusthán, profess this belief. The opulent Márwári merchants and bankers, whom we find established at the three presidencies, and in all the large cities of India, are also chiefly of this persuasion. Their Gurús are the Jattis; the Sarangis are also a stricter sect of Jains.

And. The followers of the Puráns believe in a system very little different from that of the Jains. They also maintain that the earth is a circular plane, having the golden mountain Merú in its centre; that it is 50 crores of yojans in superficial diameter; that Jambudwíp (which immediately surrounds Merú, and which we inhabit) is

\* A yojan is four ods.

one lakh of yojans in width ; that this *dwîp* is surrounded by a sea of salt-water, also one lakh of yojans in width ; that this salt sea is encompassed by a second *dwîp* of two lakhs of yojans in breadth, and it again by a sea of sugar-cane juice of the same width ; that five other belts of alternate islands and seas (each island being of double the width of its predecessor, with a sea of the same width as its adjacent island), succeed each other in regular order. The seas are of fermented liquor, *ghî*, milk, *dhaî*, and sweet-water. The *Purâns* assert, that the earth is not falling in space as the Jains maintain, but is supported by the great serpent *Shesha*. Such at last is the assertion of the *Bhâgavata*, the most popular of the *Purâns*. In others, the task of supporting the earth is allotted to the tortoise, or to the boar *Varâha*. The *Purâns* maintain that there is but one moon and one sun ; that the moon however is at a distance from the earth double of that of the sun ; that the moon was churned out of the ocean ; and is of nectar ; that the sun and moon and constellations revolve horizontally over the plane of the earth, appearing to set when they go behind *Merû*, and to rise when they emerge from behind that mountain ; that eclipses are formed by the monsters *Râhû* and *Ketû* laying hold of the sun or moon, against whom, as well as against all the other deities of heaven, they bear implacable enmity. *Vyâsjî* is believed to be the author of all the *Purâns* ; he was probably the compiler of them ; he is revered as divinely inspired. *SHANKAR A'CHÂRYA*, who flourished about 400 or 500 years ago, distinguished himself as a supporter of this system and as an enemy and persecutor of the Jains ; he was also a reformer, but his reforms were confined to morals, and to religious institutions and sacraments. The followers of the *Purâns* are by far the most numerous of the three classes. The *brâhmins*, generally the *râjpûts*, *kaiths*, and indeed the mass of the population throughout India, all belong to this class.

3rd The *jyotishîs* or followers of the *Siddhântas* believe in a system widely differing from both of these. Their system is, with the exception of a few inconsiderable differences, that of *Ptolemy*. They teach the true shape and size of the earth, and the true theory of eclipses. The earth they place in the centre of the universe, around which revolve in order, as taught by *Ptolemy*, the moon, Mercury, Venus, the sun, Mars, Jupiter, and Saturn. The irregularities in the motions of the sun and moon they account for by supposing them to move, as also did *Ptolemy*, in epicycles, whose centres revolve in their circular orbits. The authors of the *Siddhântas*, and especially *BHÂSKAR A'CHÂRYA*, the author of the most recent and most popular *Siddhânta*, called the "*Siddhânta Siromani*," have spared no pains to expose and



ridicule the monstrous absurdities of the Jain Sutrās and the Purāns. They have always professed in their writings the greatest admiration for the learned men of the West, the Ionians or "Yavans;" whilst the Purāns have denounced those who hold any communication with men of these nations, termed by them the lowest of the low. A'RYA BHA'T, the author of the A'rya Siddhānta, expressly maintains the daily revolution of the earth on its own axis, though not its annual revolution.

It is the object of this essay to draw the attention of the public, and especially that of all friends of native education to these Siddhāntas, and to recommend them to more general attention and study than they have yet found. It will be asked, "Are you of opinion that they contain any thing which has escaped the research of DAVIS, COLEBROOKE, and BENTLEY, and which may yet throw some new light on the science of Astronomy, on Chronology, or on History?" I must answer, No. But I feel assured from experience, that they afford us beyond all comparison the best means of promoting the cause of education, civilization, and truth, amongst our Hindu subjects.

4th. Here I shall be at once met with the question, "Why go back a thousand years in search of truth avowedly containing some admixture of error, when the pure and the unadulterated truth is at hand, and may be communicated with equal facility?"

To this I reply, that the pure and unadulterated truth not only cannot be communicated with equal facility, but is absolutely rejected by the mass of the Hindu population of India; but that with the aid of the authority of the Siddhāntas, the work of general and extensive enlightenment may be commenced upon at once, and will be most readily effected, the truths taught by them being received with avidity. To explain and correct their errors will at the same time be easy.

5th. With regard to the population of the three Presidencies, the argument of my supposed opponent may, and I believe, does, apply. The native mind there is fully prepared, nay, eager, to receive any cultivation that can be given to it; but what has led to this? For generations, indeed, I may say for centuries past, the native populations there have enjoyed the humanizing advantages of daily intercourse with enlightened Europeans, and foreigners of all nations; of a moderate and steady government; and of an extensive foreign commerce; there too the brāhmanes and the studious have for the same long period, had the benefit of many schools, colleges, and learned institutions, superintended by English teachers, distinguished for their learning and science; there the Press, English and Native, disseminating its daily modicum of knowledge, has at length succeeded in awakening a spirit of inquiry

and discussion; and taught the people the grand uses and advantages to which it may be applied; and there the Missionary, for generations past, has never intermitted in his sacred labours to root out the wide-spread degrading superstition, and to plant in its stead the seed of the purest morality and of true religion. There, in short, the populations have already advanced far in their course of civilization.

6th. But how widely different is the state of all the rest of the vast continent of India; at least of all Central India, including Nágpur, Berár, Málwá, and Rájputáná, in which my own personal experience has lain. The mass of the population is as rude and barbarous, and ignorant, and superstitious, as it was 17 years ago, when the supremacy of the British Government was first established. Of all the advantages, which have contributed to the enlightenment of the Native mind at the several seats of Government, it cannot be said to have enjoyed even one. What reception then can the announcement of the pure truth be expected to experience amongst a people in such state? With what reason can it be hoped, for a moment, that the English language and English literature, with its varied stores of knowledge, can here receive any cultivation? Even the most learned of the Hindu population find it impossible to comprehend, without assistance, the very best of our translations into their own languages. The native mind, habituated to the idlest absurdities, has neither relish nor taste for plain sober truth.

7th. Is it your opinion then, it may be asked, that the example of the Jesuit Missionaries of the south-west of India should be followed, and that the truth, to make it agreeable to the present state of the native mind, be dressed up in all the fantasies of a foolish superstition? By no means; I would on no account or in any degree degrade or compromise the simple dignity of sacred truth. But what prevents our availing ourselves of the circumstances which afford us the most powerful means of dispelling from the land a darkness otherwise so hopelessly impenetrable; if it be at once seen, that the Siddhántas do afford to us these most favorable and encouraging circumstances, and that to give a command and powerful influence over the native mind, we have only to revive that knowledge of the system therein taught, which notwithstanding its being by far the most rational, and formerly the best cultivated branch of science amongst the Hindus, and notwithstanding its being the foundation of such little knowledge as they display in predicting eclipses and the like, has, from the superior address of the followers of the Puráns, and the almost universal practice amongst the jyotishís, of making all their calculations from tables and short formulæ, couched in enigmatical verses, been allowed to fall into a state of utter oblivion?

8th. But how is this lost knowledge to be revived ? I shall proceed to explain. In every petty hamlet, not only in Málwá, Rájputáná, and Berár, but throughout India, you will find the joshí or astronomer and astrologer : in towns you will find many, and in large cities, even hundreds. It is their business to expound the pancháng, or almanac, to proclaim feasts and fasts, to fix the marriage-day, to tell the times of sowing and reaping ; and forewarn their flocks of unlucky days : their services in short are in constant requisition. They are conjointly with the Patwáris, the village school-masters. The village joshí can expound, but not work out the results given in his pancháng ; that high qualification belongs only to the city joshí. But it must not be supposed, that the power to make a pancháng, requires a knowledge of even the first principles or elements of his science. The utmost of his knowledge is 20 verses composing the Tithí Chintámaní, and 100 verses of a little book called the Graha Lágghava, with a power of using the tables attached to them. By these few verses he can not only find the places of the sun, moon, and planets, but also work out eclipses. But the operation may be called purely mechanical, or an effort of memory. He can find the equatorial gnomonic shadow, from thence deduce the latitude (or acshánsha) ; he can tell you the amount of chará (or ascensional difference) ; the deshantará (or distance in longitude) ; the sun's declination (or krántí) : but is wholly ignorant as to what things in nature are expressed by these terms. The verses of the Graha Lágghava and Tithí Chintámaní contain only abbreviated formulæ for calculations ; their wording is uncouth, and to the uninitiated, more unintelligible than an enigma. But though the ingenuity displayed in thus abbreviating calculations is considerable, it has had the effect above noticed of superinducing an utter neglect of the Siddhantas, in which the principles of the science are so fully, and in many respects so rationally, explained. I have met and cross-questioned many hundreds of joshís of late years ; but in this large number, have found only two men who had a rational and full acquaintance with their own system. One is VAIJNA'TH, purohit of the Maháráo of Kotah ; the other, JINCHAND, a jattí of great celebrity at Ajmere, and late of Jhuláí in Jypur. It is singular that neither of these are professed jyotishís ; the former is expounder of the Puráns, and the latter a Gurú of the Jains. Oujain, once so famous for its learning, has not now a single Siddhántí jyotishí to support its great name. Indeed, so general and entire is the ignorance of most of the joshís of India, that you will find many of them engaged conjointly with the Puránic bráhmans in expounding the Puráns, and insisting on the flatness of the earth, and its magnitude of 50 crores of yojans in superficial diameter, as explained in them,

with a virulence and boldness which shew their utter ignorance of their proper profession, which had its existence only on the refutation and abandonment of the Puránic system. The Jains and all the followers of the Puráns of whatever caste you will find, on the other hand, betraying equal inconsistency in daily appealing to the panchánga of the jyotishí, and confidently maintaining the infallibility of their contents, though founded on a system with which the truth of their own is utterly inconsistent.

Of the sincerity of the ignorance of both parties there can be little doubt, from the profound veneration with which they, but especially the joshís, regard all the Siddhántas. The Súrya Siddhánta they firmly believe to have been communicated to men by the sun himself, the authors of all they believe to have been divinely inspired. These works are now thought to be, like the Vedas, wonderful displays of Divine wisdom, but totally beyond ordinary human comprehension. That man who has mastered their contents, they regard, and even fear as one possessed with superhuman powers.

10th. With this blind veneration and strong prejudice in favor of the Siddhántas, prevailing particularly amongst the joshís scattered all over India (and the latter are by no means an inconsiderable part of the learned of India), and in some degree, now also amongst the Jain and followers of the Puráns, can we for a moment hesitate in admitting the vast benefits to which the proper employment of these prevailing prejudices will lead? How readily may a knowledge of the science, as taught in the Siddhántas, be recommunicated, especially to the joshís, whose lives are now idly spent in wading through unintelligible calculations deduced from the Siddhántas? With what exultation will every man of ingenuous mind amongst them receive explanations making plain and clear what is now all unintelligible and dark! They will not stop in simply admitting what is taught in the Siddhántas. Grateful to their European Instructors for bringing them back to a knowledge of the works of their own neglected, but still revered, masters, they will in the fulness of their gratitude, and from the exercise of their now improved powers of understanding, also readily receive the additions made during the last few hundred years in the science.

11th. From the extract now forwarded it will be at once seen, that there can be little or nothing which we have to teach in Geometry, Surveying, and Trigonometry generally, in Geography or Astronomy, of which BHÁSKAR A'CHA'RYA has not already given us the first principles, and for enabling us to explain which, he will not afford us many new and also the most appropriate arguments, in as much as they will be

best suited to Hindu taste. And what can be more flattering to the vanity of the Hindu nation, or more grateful to their feelings and prejudices as men, than to see their own great and revered masters quoted by us with respect, to prove and illustrate the truths we propound. At the presidencies, and even at many large stations, we may prosecute with success a scheme for educating the people, by at once teaching them English, or by other means equally directly attacking all that is false and absurd in their belief. At these places, all the causes above enumerated concur to prevent the failure of such a scheme. But this plan of educating the mass of the people in the interior of India, where English can never be of any practical avail to any but a very few, is perfectly visionary ; to hope to educate them by translations in the Roman character, is little less so. Even translations into their own language and in their own character are frequently, as above mentioned, wholly unintelligible to the best educated natives. I could quote many proofs of this, but the mention would be invidious ; the obvious cause of failure in all these cases is, that in these schemes we make no account of men's passions and weaknesses and prejudices, and have neglected to consult their tastes and present state of knowledge. By pursuing the course I now advocate we sail with the current, favorable gales vastly accelerating our progress ; by directly attacking on the other hand the strongest prejudices of our nature, as is done in the other case, we struggle with an adverse stream, and with baffling winds, and will be found to have struggled comparatively in vain.

12th. May I quote my own experience in proof of what is here advanced ? Since I entered the country, I have been, I hope, a warm and zealous friend of the cause of education, and have always bestowed much time and much labour upon the superintendence of such schools as have been located within the sphere of my influence. The school-books used, have been those printed at the Presidencies of Calcutta and Bombay.

But about two years ago, wishing to know how the joshís, generally so ignorant, succeeded in predicting eclipses, I went through the *Tithí Chintámaní*, and *Graha Lághava*. Finding them to contain only unintelligible and abbreviated formula, I was referred to the *Siddhántas*. These I had great difficulty in procuring, and still greater in procuring men capable of explaining their contents. By perseverance I have succeeded in gaining a limited acquaintance with their first principles. During the last four or five months, I have availed myself largely of these *Siddhántas* in teaching not only the boys of the Sehore school, but also adults, the joshís and bráhmans of the town. I beg leave to assure you, that in this short time I have succeeded in communicating

more real knowledge and information than I have done in the previous ten years of my Indian life.

A few days ago, the boys of the Sehore school and the joshís and bráhmans above mentioned, were examined by me in the presence of Captain WINFIELD and Dr. INGLIS, of this station, and Mr. MACLEOD, Assistant to the Agent to the Governor General at Jabbalpur. I confidently appeal to these gentlemen to pronounce whether the acquisitions of the students were not, considering the time devoted to the study, perfectly astonishing.

13th. It may be thought that I am here advocating too exclusive an attention to scientific education and the abstract sciences. I feel assured, however, that this will prove our shortest course also to moral improvement. Till the situation of the countries spread over the face of the globe is known, what credit can our histories gain; what impression can they make on men's minds? They may as well relate to nations existing in the moon. Till conviction of the truth of the Siddhántic system, as to the size and shape of the earth, is felt, the popular absurdities of the Puránic cosmogony will never be abandoned. I rest not merely on my own opinion and experience; I adduce that of an institution founded by a society, whose labours for the improvement of India have been most useful and exemplary. I allude to the American Mission's Seminary at Jaffna, in Ceylon, in the 2nd page of whose 3rd triennial report, published in 1833, it is stated, "that an examination of the Puránic system of geography and astronomy, compared or rather contrasted with the Copernican system, has been attended to with greater interest, and been productive of more obvious advantages, than almost any other branches of study."

The Professors of this establishment, however, do not seem to have been aware of the existence of the Siddhántas; or to have known that BHA'SKAR A'CHA'RYA had already spent the whole force of his science and ridicule in exposing the absurdities and impossibilities of the Puránic system. What European, gifted with the utmost tact and wisdom, with the most intimate knowledge of the native character, their customs, beliefs and languages, and the highest flow of eloquence in the use of them, can, by appeals to reason, by arguments and proofs, hope to work upon an ignorant and prejudiced people any effect compared to that which may be produced by a dexterous use of its blind and prejudiced veneration for authority?

14th. I may here quote another instance of the practical service recently rendered to me in my official capacity, when I was officiating as Political Agent at Kotah, by these Siddhántas. The officers employed on the grand trigonometrical and other surveys, have always experi-

enced, in almost every part of India, the greatest obstructions in the discharge of their duties, from the prejudices and ignorance of the people and their native princes. At Kotah, no less ignorance and prejudice had been displayed than elsewhere : so strong were the suspicions entertained by the late Ráj Ráná MADHU SINGH, of the designs of the British Government, when Captain PATON, the Deputy Quarter-Master General at Nímach, entered his territories to survey certain roads, &c. and so reiterated his objections in reply to the Agent, Captain Ross's assurances, that the last-mentioned officer was at length obliged to request Captain PATON to withdraw. Whilst at Kotah, I received orders from Government, desiring me again to use my influence with the Ráj Ráná to prevent all further obstructions. Upon this, I sent for VAIJANA'TH, the astronomer above mentioned, and for the Ráj Ráná's joshí, and found no difficulty, by the help of the 33rd verse here quoted, and others treating more at length on the subject, in satisfying them of our real object. They equally soon procured for me an intimation from the Ráj Ráná, that his co-operation would in future be readily given to the officers deputed to survey his territories.

15th. From the arguments and facts above recorded, the natural conclusion appears to me to be, that it will be our wisest course, at the same time that we afford every encouragement to the study of English by those who are likely to find use for it, or have leisure and talents to prosecute it with effect, to give every encouragement to the study of the Siddhantas ; and to the explanation of their contents, first to the jyotishís, whose profession is founded on the principles given in them, and through them to all their flocks. Where is the native of India, however poor, who is not constantly consulting his jyotishi ?

I would therefore recommend that no time be lost in giving to the world the best printed editions of the Siddhanta Siromaní of BHA'SKAR A'CHÁRYA, including the Goládhyáya, or Treatise on the Globes, and the treatises on Algebra and Trigonometry ; of the Súra Siddhanta, and of that of A'RYA BHA'T, with PRITHUDAK'S commentary, the author who maintains the diurnal though not the annual revolution of the earth.

The Graha Lágghava (which, as far as my inquiries extend, seems to be in almost universal use over the greater part of India,) will perhaps be even of more use than the Siddhantas, if accompanied by the most excellent and rational commentary of MALLA'RÍ. Almost all these works contain a chapter on the construction and use of the globes. These the natives at our colleges should be encouraged to construct accordingly, and to compare and contrast them with our globes, without which no school or college in India ought to be. My own pandit and

the bráhmans of Sehore, who have become converts to the Siddhánta and our system, all express the utmost anxiety to get globes if possible in Hindí, convinced that they will prove to others as they have done in their own case, the readiest means of demonstrating to them the truth.

16th. It is strange and deserving of remark, that though astronomy is the science which has been most cultivated by the Hindus, and has most attracted the notice of the learned in Europe, and, as above shewn, is also best calculated to promote the work of education, still not a single standard, or indeed any work whatever on this subject, has yet been printed in India. From Mr. LUSHINGTON'S History of the Calcutta Institutions, it appears in pp. 126, 127, that in the Government Sanscrit College the Jyotisha Shástra is not even embraced in the course of study pursued there. It surely has incomparable advantages over the Hindu systems of Logic, Rhetoric, Prosody, and even over Law and Grammar, as far as education is concerned, essential though the last mentioned be. So entirely have we neglected the study of late years, that Professor SCHLEGEL (as I observed from a late number of your Journal) takes credit to himself for being the first to expound to the European scholar, the method used by the Hindus in their astronomical works, of expressing numbers by symbolical words. You seem inclined to give to the learned Professor great credit for having unravelled this mystery in the absence of native pandits. It is by no means my wish to detract from the merits of the learned Professor; but surely when every astronomical work is accompanied by a commentary, explaining in plain language, and also in figures, the symbolical expressions of the text, little credit is claimable for unravelling a mystery already made plain. Under these circumstances, it is by no means strange, that Messrs. COLEBROOKE, DAVIS, BENTLEY, and JONES, thought it unnecessary to offer any explanations on a method at first sight so mysterious, but so palpable on referring to the commentary which almost invariably accompanies the text.

17th. But to return to the subject in hand, it seems to me most desirable, that the books above-mentioned should be published without delay; at present revered though they are, they are exceedingly difficult to be procured. Any gentleman moderately conversant with Sanscrit, and with the elements of the science of astronomy, will, if he have leisure, readily master all they contain in a very few months. This accomplished, how largely will his powers of superintending the work of education, and especially that of translation, be augmented! I trust that not a few of the many ardent friends of education will avail themselves of the advantages to be derived from these



works here set forth, and give to the native public, translations in the vernacular languages, with such corrections, improvements, and additions, as will place the Hindus at once in possession of all the recent discoveries of Europeans. At no place have more elementary scientific works been translated and printed than at Bombay, chiefly under the superintendence of the late zealous and accomplished Secretary to the Bombay Education Society, Major GEORGE JARVIS of the Engineers; but the usefulness of his labours is much detracted from, by his omission to make use of the terms, and mathematical phraseology, perfectly well understood by scientific Hindus, if not by bráhmans generally, and by substituting others of his own coining, which must be wholly unknown to them. The term Spársha Rekhá, (for the tangent,) and several others for lines, &c., which the Hindus have never used or known, are in themselves highly appropriate and unobjectionable.

18th. I now beg to draw your particular attention to the original extracts, which appear to me most curious, and calculated to prove to others as it has done to myself, most valuable and useful.

In the first three verses BHA'SKAR A'CHA'RYA, after stating the earth to be a sphere poised in space, exposes in a most rational and forcible manner, the Puránic doctrine of its being supported by the grand serpent Sheshá, or any material thing.

In the 24th and 25th verses, our author shews, that he had got a glimpse of the true nature of attraction and gravity; he then proceeds in the 26th, 27th, 28th, and 29th verses, to expose in his own way (not altogether philosophical), the Jain articles of belief, that the earth is perpetually falling in space, and that there are two suns, two moons, and two sets of constellations.

In the 30th, 31st, and 32nd verses, by a very rational argument, the modern Bráhmanical belief of the earth's flatness is exploded; he ridicules the idea of their immense mountain of gold, called Merú, and accounts for the apparent flatness of the earth.

In the 33rd, 34th, and 35th verses, he gives succinct general directions for the measurement of an arc of the meridian, and thence deduces the real magnitude of the earth, deriding the absurdity of the dimensions alleged in the Puráns.

In the 36th verse, he shews such a limited knowledge of geography, as would entail a whipping on any boy of eight years of age in Europe; but in the three last verses, he shews that he, 800 years ago, had such a perfect knowledge and conviction of the consequences resulting from admitting the spherical form of the earth, viz. of the existence of anti-

podes, &c. as the priests and princes of Europe could not be persuaded to entertain four or even but three hundred years ago; and for asserting which, they were sending our earliest philosophers to the dungeon.

19th. I take this opportunity of informing the public of the existence of a native observatory at Kotah, or rather of a valuable collection of astronomical apparatus, made by the late Maháráo UHMAID SINGH; and posited on one of the bastions of the citadel, fitted up for their reception. This apparatus consists of a very splendid and large armillary sphere; of the celestial and terrestrial globes, dials, gnomons, and also the Ráj Yantra, or astrolabe, borrowed from the Musalmáns about 250 or 300 years ago. The axes of the globes are fixed at an elevation of  $24^{\circ} 30'$ , the supposed altitude of the North Polar Star at Kotá. But the latitudes given by the native astronomers, for all the principal cities of Rájputáná and Málwá, are under-rated by about  $40'$ ; that of Kotah is, I believe,  $25^{\circ} 10'$ . The authority of BHA'SKAR A'CHA'RYA has led to this error. In the 34th verse here quoted, the latitude of Oujain is stated at  $\frac{1}{8}$  of  $360^{\circ}$ , which would give just  $22^{\circ} 30'$ . This accordingly is always stated by Native Astronomers as its latitude, and when I have stated the result not only of Dr. HUNTER's but also of the celebrated Rájá JAY SINGH's more accurate observations (vide vol. vi. Asiatic Researches); this verse has always been quoted to me to prove their assertions.

The Maháráo's collection contains also a Túriya Yantrá, or quadrant, with a radius on one side of 30 digits, and linear rectangular intersections, rising from each digit, representing their whole canon of sines, cosines, and versed sines adapted to this radius. From the Maháráo's astronomer I procured a copy of the Sanscrit treatise on the quadrant, called the Yantra Chintámaní, by CHAKRADHARA, son of SRI WÁMÁNA, containing directions for the construction and use of the instrument, with the mathematical proofs and demonstrations of all the many problems which may be worked by it. The reverse side of this quadrant contains the signs and degrees of the ecliptic, and an hour circle, with an index-hand by which you are enabled to tell at once the lagna (or horoscope), that is, the exact point or star of the ecliptic, rising in the horizon at any given time.

I am unable at the present moment to fix the date of this work, but I am inclined to think that it is not of a much more ancient date than the astrolabe, and that it, like the astrolabe, has been borrowed from the Musalmáns.

To the European public, translations of this and the other works alluded to in this letter, would be highly curious and highly valuable. To enable us to communicate our greater knowledge in the sciences

they treat of, the study of them would seem indispensable, to give us a due command of their mathematical modes of expression. I earnestly hope, that some persons better qualified than myself, may be induced to undertake the task of translation. I do not refuse the task; but I confess my present incompetence, from my own limited knowledge of mathematics, to understand and follow the authors of these learned works in their more abstruse calculations; and the never-ceasing pressure of arduous and responsible public duties, prevents my devoting such time to the study as would better qualify me for the duty. It would be unjust in the public to expect, and imprudent in me to promise much; what I can, I will do. But the public may with much justice turn their eyes upon those men of science at the head of our schools, colleges, and literary institutions now scattered over India. To a MILL, a YATES, a TYTLER, a SUTHERLAND, a THORESBY, and many other distinguished scholars of this Presidency, and to the two JERVISES of the Engineers, and to many gentlemen of the Scotch and American Missions, so much distinguished for their labours in the cause of education, on the Bombay side of India, the task would be easy; I hope it will not be declined.

*Extract from Bhāskar A'chārya's Treatise on the Globes.*

भूमेः पिण्डः शशाङ्कश्चकविरविकुजेव्याकिमचकचा  
 दृतेर्दृतेः सन् मृदमिलसलिलयोमतेजोमयोयं ।  
 मान्याधारः स्वशक्त्यैव वियति नियतं तिष्ठतीहास्यं पृष्टे  
 मिष्टं विश्वस्य शशत्सद्नुजमनुजादित्यदेत्यं समन्तात् ॥ २१ ॥

Verse 21st. This sphere of the earth, formed of the five elementary principles, viz. earth, air, water, the ethereal atmosphere, and fire, is perfectly round, and encompassed in the orbits of the moon, Mercury, Venus, Mars, Jupiter, Saturn; and lastly, by that of the constellations. It has no material supporter, but stands fixed in air by its own inherent force. On its surface, all living and inanimate objects subsist throughout, as well titans, as human beings, gods, as well as daityus.

सर्वतः पर्वतारामग्रामचैत्यचयैश्चितः ।

\* कदम्बकुसुमग्रन्थिः केशरप्रसरैरिव ॥ २२ ॥

Verse 22nd. Its surface is bespread on all sides with numberless mountains and groves, towns and buildings, as the bulb of the flower of the Kadamb tree is covered with filaments without number.

मूर्त्ता धर्ता चेद्वरिद्यासद्व्यसत्याप्यन्योप्येवमचामवस्था ।

संत्ये कल्प्या चेत्स्रगतिः किमाद्ये किन्नो भूमेः साहमूर्तेश्च मूर्तिः ॥ २३ ॥

Verse 23rd. Let it be admitted, that this earth is supported by any material substance, or living creature, still for the support of that, a second supporter is

required, and for that second in like manner, a third is necessary. Here you have the absurdity of an interminable succession : if reduced to admit a power of self-support in that which you place the last of the series, I would ask, why not admit the same power in the earth itself, the first of the series ? for the earth is one of the forms of the eight-fold divinity.

यथोष्णतार्कानलयोश्च शीतता विधौ द्रुतिः के कठिनत्वमग्नि ।

मरुचलो भूरचला स्वभावतो यतो विचित्रा वत वस्तुशक्तयः ॥ २४ ॥

Verse 24th. As heat is the inherent property of the sun and of fire ; as cold of the moon, fluidity of water, and hardness of stones ; as the air is volatile, and the earth is immovable, and as other wonderful (oh ! how wonderful !) properties belong to other things :—

आकृष्टशक्तिश्च मही तथा यत् स्वस्थं गुरु स्वाभिमुखं स्वशक्त्या ।

आकृष्टते नत्यतरीव भाति समे समन्तात् पतत्वियं खे ॥ २५ ॥

Verse 25th. In like manner, the power of attraction is inherent in this globe of earth. By this inherent power, any thing heavy projected into the air is attracted down to it. The thing so projected appears to be falling of itself ; but in fact, it is in a state of *being drawn downwards by the earth*. If, with the Jains you suppose the earth to be perpetually falling in space, in what direction, I ask you, is it falling ? Above and below and all around the ethereal expanse is equally outspread.

भपञ्जरस्य भ्रमणावलोकादाधारशून्या कुरिति प्रतीतिः ।

स्वस्थं न दृष्टुं गुरुक्षमातः खेऽधः प्रयातीति वदन्ति बौद्धाः ॥ २६ ॥

Verse 26th. That the earth is poised in space, and without support, the fullest assurance is felt from beholding the revolutions of the circling constellations ; but the Jains maintain, that it is perpetually falling downwards in space ; resting the proof of this assertion on the fact, that all heavy things naturally fall downwards, and that the earth is the heaviest of heavy visible things.

द्वा द्वौ रवीन्दू भगणौ च तद्द्वेकान्तरन्नावुदयं व्रजेतां ।

यद्ब्रुवन्नेवमनंबराद्या ब्रवीम्यतस्मात्प्रति युक्तियुक्तं ॥ २७ ॥

Verse 27th. The Jains and others likewise maintain, that there are two suns, and two moons, and also two sets of constellations, which are rising in constant alternation. But to them I give this appropriate answer.

भूःखेऽधः खलु यातीति बुद्धिबौद्ध मुधा कथं ।

जाता यातं तु दृष्टापि खे यत् क्षिप्रगुरु क्षितिं ॥ २८ ॥

Verse 28th. Let it be admitted, that the earth is falling downwards in space ; but O Jain, dost thou not see that every heavy thing projected into space, comes back again to, and overtakes, the earth ? How then can your idle proposition hold good ? If true, a heavy thing once projected into air would keep at an uniform distance from, but never overtake, the earth.

किं गणं तव वैगुणं द्वैगुणं यो दृष्टा कथाः ।

भाकेन्दूनां विलोक्याद्वा भ्रुवमस्यपरिधमं ॥ २९ ॥

Verse 29th. What can I say to your folly, O Jain, who without object or use supposest a double set of constellations, two suns, and two moons ? Canst thou not at times see the circumpolar stars revolving round the polar star, even in broad day-light ?

यदि सना मुकुरोदरवन्निभा भगवती चरणी तरुणिःचिते ।  
उपरि दूरगतोपि परिधमन् किमु नरैरनरैरिव नश्यते ॥ ३० ॥

Verse 30th. If this blessed earth were like the surface of a looking glass an extended plane, why should not the sun, even when removed to a distance from the earth, as at night, (the Puráns assert that it revolves in a horizontal circle, as it does when seen from the poles,) still be visible in every part of its revolution to men, as well as to the gods ?

यदि निग्राजनकः कमकाचसः किमु तदन्तरगः स न दृश्यते ।  
उद्गमयं ननु मेवरश्मिंशमान् कथमुदेति च दक्षिणभागके ॥ ३१ ॥

Verse 31st. If (the intervention of) Merú causes night, why is not this mountain, when between us and the sun, visibly developed to our eyes? Let it be granted that this Merú is, as is stated in the Puráns, situated to the north, pray tell me why should the sun ever rise at all in the south, as it does when it has southern declination ?

समे यतः स्यात्परिधेः शतांशः पृथ्वी च पृथ्वी नितरां तनीयान् ।  
नरश्च तत्पृष्ठगतस्य शब्दा समेव तस्य प्रतिभात्यतः सा ॥ ३२ ॥

Verse 32nd. The fact is, that one hundredth part of the circumference of the earth is or may be assumed to be a plane. The earth is an excessively large body; a man is immeasurably smaller; and hence it is, that to him, as he stands on its surface, the whole earth has the appearance of being a plane.

पुरांतरं चेदिदमुत्तरं स्यात्तद्विस्त्रेणलवेसादा किं ।  
चक्रांशैरित्यनुपातयुक्त्या युक्तं निरुक्तं परिधेः प्रमाणं ॥ ३३ ॥

Verse 33rd. The measurement of the circumference of the earth is easily and correctly ascertained by the simple rule of proportion, in this way—there is a town situated to the south; you are residing in another lying due north of it; ascertain the distance between the two, and the difference of their latitudes; then say if the number of degrees (difference of latitudes) give this distance, what will the whole circumference of 360 degrees give ?

निरक्षदेशात् चित्तिषोडशांशे भवेदवन्ती गणितेन यस्मात् ।  
तदन्तरंषोडशसंगुणं सद्भूमानमस्माद्बहु किं तदुक्तं ॥ ३४ ॥

Verse 34th. Oujain, for instance, is ascertained by calculation to be distance from the equator, where there is no latitude,  $1\frac{1}{8}$  part of the whole circumference of the earth—this distance multiplied by 16, will be the measurement of the circumference of the earth: what reason then is there in asserting such an immense magnitude of the earth ?

शृंगान्मति पश्यति पश्यतोदयास्तश्यायादिकं परिधिना घटतेऽमुना हि ।  
नान्येन तेन जगुश्चक्रमहोप्रमाणाप्रमाणासन्वययुजा व्यतिरेककेण ॥ ३५ ॥

Verse 35th. By assuming as true this circumference thus ascertained, the calculations of the position of the moon's cusps, the conjunctions of the planets, eclipses, the times of the rising and setting of the planets, and the lengths of the shadows of the gnomon, and the like, correspond with the observed facts. By assuming any other circumference, no such correspondence is found to exist. The truth of the above-mentioned measurement of the earth is thus plainly established by the law of "rule and exception" set forth in the Nyáya Shástri.

लंका कुमध्ये यमकोटिरस्याः प्राक्पश्चिमे रोमकपतनस्य ।

अधस्ततः सिद्धपुरं सुमेरुः मेरुश्चो याम्यो बडवानलस्य ॥ ३६ ॥

Verse 36th. Lanká is situated in the middle of this globe ; Yamkothi is situated to the east of it ; to the west is Rome or Romaka Patan ; the city of Siddhapur is on the opposite side of the globe to that of Lanká. Sumerú is situated to the north, on the North Pole, and Baravanala to the south, at the South Pole.

कुहपपादान्तरितानि तानि स्थानानि षड्भोजविदे वदन्ति ।

वसन्ति मेरौ सुरसिद्धसंघा ये, सर्वे च सर्वे नरकाः सदैत्याः ॥ ३७ ॥

Verse 37th. These six places are situated at a distance of one-fourth part of the earth's circumference, each from its adjoining one ; so say those who are acquainted with the globe. At Merú the various classes of the gods and pure spirits have their abodes : at Baravanala, at the South Pole, are situated the residences of all the evil spirits.

यो यत्र तिष्ठत्यवनिं तत्रस्थानात्मानमस्या उपरिस्थितं च ।

स मन्यतेऽतः कुवतुर्थमस्या मिथश्च ते तिर्यगिवा मनन्ति ॥ ३८ ॥

Verse 38th. A man, on whatever part of the globe he is placed, thinks the earth to be under his feet, and that he is standing upright upon it ; men placed at the distance of 90 degrees, or one-fourth of the earth's circumference, from each other, fancy each other to be standing as it were at right angles to each other.

अधः शिरस्काः कुदन्तारस्याः शयामनुधा इव नीरतीरे ।

अनाकुलास्तिर्यग्धः स्थिताश्च तिष्ठन्ति ते न च वयं यथाच ॥ ३९ ॥

Verse 39th. Those who are placed at the distance of half the earth's circumference from each other, are antipodes each to the other, and fancy each that the others have their heads turned into directions exactly opposite, in exactly the same way, as a man beholding his shadow on the bank of a river.

But neither do those who are standing at right angles to each other, nor those with their heads turned into directions opposite to each other, feel any difficulty in maintaining their several positions. They stand as perfectly at ease in their respective positions, as we do here.

[We have had much pleasure in giving insertion to the above article, in the sentiments of which we entirely concur. While we endeavour to push our own systems of instruction and science in this country, we are too apt to spurn and decry the literature, the science, and even the languages of the east, as if they were not only incapable of imparting the smallest particle of knowledge, virtue or truth, but incapable also of improvement by engrafting upon them the new growth of western knowledge, which has sprung ahead of the Asiatic and elder stock only within the last century or two. Were the moralist to follow Mr. WILKINSON'S example, he could doubtless produce from the mental philosophy of the Hindus parallel maxims for most of those in our own moral code :—the selection of these ;—their separation from the dross of the ancient schools ;—and their presentation to pupils in this form, would doubtless work the same wonders in moral education, as has the Siddhanta system in the astronomical classes of Mr. WILKINSON. We trust this gentleman, evidently qualified by taste as by ability for the task, will favor the English reader with a full translation of the *Síromani*. The astronomical formulæ of the *Siddhanta* have been fully made known to us, but not the arguments and reflections with which they are accompanied.—ED.]

VIII.—On the Land Shells of India. By Lieut. THOS. HUTTON, 37th  
Regt. N. I.

[Continued from the 26th No. of the Journal.]

I have the pleasure to inform you of the discovery of a few more species of Land Shells, made during a hurried trip between Nemuch and Mhow, in the month of December last.

26. The first is a species of *CYCLOSTOMA*.

*Animal*—furnished with two cylindrical tentacula; eyes black, and placed at the exterior base of the tentacula, there are also two blackish points at the summits of the tentacula, which have the appearance of eyes; head very long, probosciform, and emarginate. The eyes causing a thickening of the tentacula. Colour pale brown; skin transversely wrinkled like that of a leech

*Shell*—with five whorls; spine prominent; whorls rounded: the sutures well defined, colour of the shell above varying considerably in different specimens; some being of a purplish brown, others brown, and some nearly white—this appears to be owing to the degrees of exposure to the sun, which the individuals may have undergone, as well as age. The colours are laid on in short crooked lines, transversely; alternately a brownish and a whitish stripe, very minute. The under side is white. Aperture circular, margins united and more or less reflected. Umbilicus well defined, discovering the three previous whorls. Operculum calcareous. Diameter half an inch.

Found buried at the roots of grass growing beneath low shrubs in uncultivated plains between Nemuch and Mhow.

27. *CAROCOLLA* ———?

*Animal*—unknown.

*Shell*—white with a purplish band longitudinally placed on the body whorl above. Aperture oval and obliquely transverse. Umbilicus discovering the previous whorls—margins of the mouth reflected and interrupted on the body whorl, a thin plate interposing. Diameter about five and half or six lines; aperture longer than broad.

With the exception of the more contracted and obliquely transverse aperture of the present species, it would appear almost identical with the shell described by me, as a doubtful *Cyclostoma* (No. 2) in the 26th No. of the Journal. Specimens of both were buried together.

Found in uncultivated plains, buried in the earth at the roots of coarse grass—between Nemuch and Mhow.—I found no operculum.

28. *HELIX* ———,

*Animal*—with four tentacula, the superior pair longest, and bearing the eyes at the summits—colour freckled brown.—Foot long and rather tapering posteriorly.

*Shell*—with six whorls, globose, and the body whorl forming the greater portion of the shell.

In the living animal it is mottled with pale brown and black, from the thinness of the shell rendering the colours of the animal visible; but when dead, wholly of a dull white:—spire very little raised above the whorls; aperture lunated, margins acute; diameter 9 lines.

The animal stops up the mouth of the shell with a hard calcareous operculum, but which is only temporary, not being attached to the body.

Found buried in the earth with the foregoing beneath shrubs, in uncultivated grounds, between Nemuch and Mhow.

29. *HELIX* ———,

*Animal*—with four tentacula, the superior longest and bearing the eyes at their summits; foot elongated and rather truncated posteriorly; colour pale yellowish brown.

*Shell*—with six whorls; spire moderately raised above the plane of the whorls; colour sandy; diameter, half an inch.

Found with the preceding.

These two specimens appear to be true *Helices*.—Unlike the species No. 3, described in the 26th No. they have no tentaculiform processes on the right side, playing over the surface of the shell when the animal is in motion, nor have they the fleshy hook on the tail.

The shell of the species which I formerly described with a mark of doubt as a *Helix*, is very like in form and general appearance to the present species, No. 29: but the polish of the shell is very superior to this last.

30. *ACHATINA* ———?

*Animal*—unknown.

*Shell*—with 10 whorls; pale sandy brown; spire obtuse; cylindrical; aperture longitudinal, subovate, right lip edged; pillar smooth, straight, and truncated at the base; length,  $1\frac{1}{4}$  inches, smooth and shining.

Found buried in the earth, foot foremost, at the roots of shrubs, in uncultivated grounds, between Nemuch and Mhow.

Among these shells, I could observe no partiality for any particular aspect, nor any thing to confirm the opinion which I formerly hazarded, of this being one of the habits of the Land Shells. Nevertheless, I am still inclined to retain that opinion, because the circumstance may hold good with regard to those species which are more particularly found in rocky situations, and where the hot winds, striking throughout the day against the rocks, would of necessity impart a great and overpowering degree of heat to the retreats of these animals, even when



buried in the earth—while on the other hand, the species, which I have here endeavoured to describe, inhabiting wide and flat plains, are under no necessity of placing a farther barrier between themselves and the wind, than that which is afforded by the earth in which they lie torpid, in as much as meeting with no obstruction, the scorching blast sweeps rapidly over the hardened surface, without penetrating sufficiently deep, or at least with sufficient power to cause any injury or inconvenience to the animals buried some 6 or 8 inches deep, and protected by the branches of the dwarf shrubs beneath which they are found.

Of these shells, I shall take an early opportunity of forwarding specimens.

IX.—*Account of the Bearded Vulture of the Himálaya. By the same.*

I know not if this magnificent bird has yet been recognised by ornithologists as an inhabitant of the lofty mountain ranges of Thibet, and I have therefore little hesitation in recording the fact. A specimen sadly torn and mutilated by insects was a short time since pointed out to me as a Golden Eagle (*Aquila chrysaetos*), from the hills, and having often before seen those noble birds both living and in museums, I paid no attention to it at the time.—On an after occasion, when the specimen was thrown away as useless, I happened accidentally to cast my eyes on it, and saw at a glance that it was not a Golden Eagle. A suspicion of the truth at the same time crossing my mind, from the circumstance of the black beard, which in this bird is so conspicuous, being still a very prominent feature, notwithstanding the ruinous state of the specimen, accordingly I took the skin home with me to examine at my leisure, and the following description is the result :

GYPEATUS BARBATUS ?

Length from the tip of the beak to the end of the tail 3 ft. 11 in. Beak, from the tip to the gape, 4 in. ; breadth from tip to tip of the expanded wings, 9 ft. 6 in. From the base of the upper mandible arises a black stripe of short hairs or bristles, passing over each eye, and turning round the back of the head, where it joins the stripe from the opposite side ; the crown of the head, which is much flattened, is covered with small whitish feathers ; but across these, running longitudinally from the base of the upper mandible to the black which passes round the back of the head, is a black stripe of narrow feathers. The chin, throat, back, sides, and forepart of the neck ; the breast, belly, vent, thighs, and under tail coverts, deep ferrugin-

ous; darkest on the chin, throat, and fore-neck, whiter on the vent and thighs.—A band or collar of dark brown feathers across the bottom of the knee, joining the black on the back, and thus forming a ring round the neck—back, scapulars, greater and lesser wing coverts, brownish black; the shafts of the feathers white, towards which the webs also grow lighter—upper-tail coverts and the quills of the wings and tail, greyish, or ashy black.—The first quill of the wing is  $3\frac{1}{4}$  inches shorter than the second, and the third is the longest.—Tail feathers twelve in number, and gradually decreasing in length from the centre to the outermost ones, forming a well-marked wedge.

Beak, feet, and claws faded to yellowish horn, the original colour not ascertainable.

The nostrils are entirely concealed beneath the jet-black bristles which stand forward over them, and which are a continuation of, or rather take their rise from, the point whence springs the black stripe which passes over the eyes.—At the angle of the lower mandible is a bunch of long black bristles, diverging and hanging down like a beard.—The beak is straight from the base to the end of the cere, which is very thin, and it then rises into an arch, and curves strongly to the point.—Legs short and feathered to the toes; outer and hinder claws, the largest: the inner one about half their size.—All moderately hooked, and much worn at the points.

In all other respects it appears to agree accurately with the description given of the Bearded Vulture in the "Gardens and Menagerie of the Zoological Society."

This specimen will be found to differ from the bird there figured in the following particulars:—The Bearded Vulture is stated to have "the upper part of the head of a dirty white," while in mine there is a black line across the white; this however might lead one to suspect the bird to be a young one, although the rest of the plumage does not appear to differ from that of the adult bird, showing no signs of the "white spots, or spots of a lighter shade, scattered over the back and wings," as alluded to in the work above-mentioned.

Again, it is said to have "the first quill-feather of the wing nearly equal to the second and third, which are the longest," &c.—In my bird, the first quill is  $3\frac{1}{2}$  in. shorter than the second, which is a quarter of an inch shorter than the third; the third quill being consequently the longest, and the fourth nearly equal to the second.

This last character is perhaps a strong reason against supposing the two birds to be identical, and together with the different marking of the head and the ring on the neck, may go far to establish it as a

new species: but of this nothing positive can be said until some ornithologist on a visit to the hills may be fortunate enough to meet with the living bird, and have an opportunity of proving either the identity or distinctness of the species by observing the changes of plumage from youth to maturity—in the mean time, I have noted it down with a mark of doubt, as the Bearded Vulture of authors.

*Nemuch*, 21st Feb. 1834.

### X.—*Proceedings of the Asiatic Society.*

*Wednesday, the 5th November, 1834.*

Dr. J. TYTLER, Senior Member, present, in the chair.

The Report of the Committee of Papers upon the list of names, proposed at the last meeting as honorary members of the Society, was submitted, when the following were balloted for and duly elected. MEKHARA MENG, uncle to the king of Ava; Professor HEEREN, M. KLAPROTH, and Prof. ROSEN; Sir JOHN HERSHELL, Prof. BUCKLAND and Col. SYKES.

Read, letters from the Secretaries of the Royal Society, the Royal Asiatic Society, and the Geological Society, acknowledging the receipt of the 17th and 18th vols. of the Researches.

Also, from Professor SEDGWICK, and from Mr. AIKIN, Secretary of the Society of Arts, expressing thanks for the second part of the 18th vol. As. Res.

Read a letter from Col. J. STUART, Deputy Secretary to Government, Military Department, intimating that the Honorable Court of Directors have, in a recent dispatch, informed the Government that the suggestion of the Society regarding a supply of tubes and apparatus for boring, will be attended to.

[We have since heard that they are on board the *Sir Edward Paget*.]

Read a letter from Captain R. HOME, proposing on the part of his brother, Col. HOME and himself, to deposit in the apartments of the Asiatic Society, the valuable collection of paintings, books, and casts, belonging to the gallery of the late R. HOME, Esq., of Lucknow, in compliance with the wish expressed by their father previous to his demise, that they should be preserved in some public institution in Calcutta, where they might be properly attended to, and at all times open to public inspection.

*Resolved*, that the thanks of the Society be returned to Col. and Capt. HOME for their most liberal offer, which they embrace with pleasure; and that suitable preparation be immediately made for their reception.

[The collection of paintings comprises the following valuable originals:—

Woman taken in adultery, by Dominichino, 6 ft. 2 in. by 4 ft.

Cleopatra, Guido, 4 ft. by 3 ft. 3 in.

Crowning of Mary de Medicis, Rubens, 5 ft. by 3 ft.

Infant Jesus, ditto, 4 ft. by 3 ft.

Sir William Jones, as a boy, Sir Joshua Reynolds.

Cupid asleep on a Cloud, Sir Joshua Reynolds.

Prodigal Son, Bassan, 5 ft. by 3 ft. 8 in.

Cathedral at Antwerp, Steinwich the Elder, 3 ft. 9 in. by 2 ft. 10 in.

Triumphal Arch, (Titus') unknown, 5 ft. by 3 ft. 9 in.

Ghat at Benares, Daniel, 5 ft. by 3 ft. 4 in.

2 Views in Venice, Canaletti.

2 Views in Wales, Davies.

Head of an Old Man, on pannel, unknown.

And the following Portraits:—Warren Hastings, Lord Cornwallis, Lord Wellesley, Lord Minto, Sir G. H. Barlow, Sir E. Paget, Sir W. Jones, Dr. Fleming, Horace H. Wilson, Dr. Hare, the Nawab of Dacca, Col. Duff, Gen. Jones, and Dr. Laird.

They are now on their way down by water. The public are not generally aware that the Museum and Library of the Asiatic Society are at all times open to visitors, between the hours of 6 A. M. and 4 P. M. None but members of course have the power of taking books out of the rooms.]

#### *Library.*

The following donations to the library were announced :

LT. A. CONOLLY'S Overland Journey to India,—*presented by F. Macnaghten, Esq. on the part of the author.*

DR. BAIRD'S Observations on the Neilgherry Hills,—*by W. H. Smoelt, Esq., the editor.*

M. EUGENE BURNOUR'S Observations sur la partie de la Grammaire comparative de M. F. BOZP, qui se rapporte à la langue Zende,—*by the author.*

REV. W. D. CONYBEARE'S Report on the Progress, Actual State, and Ulterior Prospects of Geological Science,—*by the author.*

COUNSELLOR JOSEPH VON HAMMER'S German Translation of the Turkish Poet Fazli's *Gul o Bulbul*, with the original text in the Nashki character,—*by the translator.*

Annals of Literature of Vienna, Nos. 61, 62, 63, 64,—*by the same.*

C. T. BEKE'S Origines Biblicæ, or Researches in Primeval History,—*by the author.*

*Archæologia*, the 25th vol. of the Transactions of the Antiquarian Society,—*by the Society.*

Transactions of the Royal Society of Edinburgh, vol. xii. pt. 2nd, and Nos. 1 and 2, of its Proceedings,—*by the Society.*

Anniversary Address for 1834, by G. B. GREENOUGH, President, and Proceedings of the Geological Society of London, Nos. 32, 33, 34, and 35, with Index of vol. I.—*by the Society.*

Journal Asiatique, No. 76,—*by the As. Soc. of Paris.*

The Indian Journal of Medical Science,—*by the editors.*

Meteorological Register for August and September,—*by the Surveyor General.*

Ditto, kept at Cawnpur, to the end of September, 1831,—*by Col. Pollock.*

The following books were received from the London Booksellers:—

LARDNER'S Cabinet Cyclopedia, Arithmetic, Manufacture in Metals, and Middle Ages, 3rd vol.

*Literary Communications.*

The Secretary reported receipt of a continuation of the late Mr. GEORGE TREBECK'S manuscript journals, (Cashmír to Cabul, May—June, 1823,) presented by his brother Mr. CHARLES TREBECK, who had at length recovered it through Mr. FRASER of Delhi. It is believed that other portions of his and of MOORCROFT'S papers still remain up the country. *Resolved*, that the present portion be despatched forthwith to Professor WILSON, who is now engaged in publishing the former part of MOORCROFT'S Journals, on the part of the Society.

A letter was read from the Baron VON HAMMER, dated Vienna, 31st March, 1834, presenting a manuscript analysis and translation in part of a rare and valuable Arabic work entitled '*Mohit*,' by *Kiatib Rúmí*.

"After my return from Italy, where I found at Naples, in the year 1825, in the library of the Museo Borbonico, Kiatib Rúmí's *Mohit*, which contains a treatise on navigation in general, and that of the Indian seas in particular, I redoubled my commissions at Constantinople for this exceedingly rare manuscript, and was last year so fortunate as to purchase a copy of it.

"I hasten to transmit some extracts to the Asiatic Society, which if they are thought interesting enough, I shall have great pleasure in continuing."

An account of the overland journeys of the same Arabic author, by M. VON HAMMER, appeared in the first part of the Bombay As. Soc. Transactions, in which an allusion is made to the present work. (See also Orient. Mag. l. 233.)

A letter was read from W. H. WATHEN, Esq. Secretary to the Bombay Government, transmitting by order of the Right Honorable the Governor in Council, a copy of an inscription found on the Arabian coast at a place called Hasan Ghorab, near Aden, together with a graphic description of the ancient fort, drawn up by Lieutenant WELSTED of the Indian Navy.

[This paper will have an early place in the Journal.]

Read a letter from the Rev. J. STEVENSON, on the subject of the Inscriptions engraved on the excavated temple at *Karli* near *Púná*, which he has succeeded in decyphering with the assistance of the alphabet of the Allahabad monument published in the Journal As. Soc.

[This paper is inserted in the present number.]

The continuation of Lieut. FOLEY'S description of Ramree Island was received and read.

Extracts of a private letter to the Secretary, from Captain C. M. WADE, Political Agent at Ludiána, were read, enclosing a Memoir in French, by M. COURT, an officer in the service of Mahárájá RANJÍT SINGH, detailing his operations on several other *Topes* in the neighbourhood of that originally opened by General VENTURA; one of them affording highly interesting results.

Captain WADE also forwarded a letter from General VENTURA himself, who, in continuation of his former important researches, has since collected upwards of five hundred ancient coins, which he has entrusted to M. ALLARD, for the Museum of Paris, politely offering their inspection and examination to the members of the Asiatic Society, as long as M. ALLARD may remain in the metropolis.

“ Dans la mois de Janvier dernier me trouvant campé entre l'Hidaspe et l'Indus, je me disposais à faire des nouvelles recherches et visiter moi-même plusieurs ruines que je savais exister dans ces contrées lorsqu'un coup de paralysie vint m'arrêter dans mes dispositions : alors j'envoyais mes gens à la decouverte et je fus assez heurcux de les voir retourner avec une collection de belles medailles que je viens de remettre au cher M. WADE qui vous les fera parvenir, je le pense, par les soins de M. ALLARD qui se rend à Calcutta incessamment : mais, n'ayant pas été sur les lieux moi-même, je ne puis accompagner ces medailles que de quelques notes des endroits où elles ont été trouvées.”

*Physical.*

Fossil shells, part of the foot of a tortoise, and various minerals, (including coal,) from Ramree, were received from Lieutenant FOLEY.

A note to Lieutenant ARCHBOLD respecting the shipment of the mummy from Mocha was communicated. The *Malak-ul Bahr* was to have brought it, but the crew refused to keep it on board after it had been shipped.

A letter was read from Captain CAUTLEY, dated Delhi, the 14th October, descriptive of the collection of fossil bones made by Serjeant DEAN, from the Jumna, and stating, that he was deterred from making further presentations to the Society's museum, on account of the expence of conveyance from so great a distance. In reference to this subject, it was moved by the Secretary, seconded by Dr. J. TYTLER, and *Resolved unanimously,*

“ That Serjeant DEAN be remunerated for the expences incurred by him for the transmission of fossils from the Upper Provinces to Calcutta, and that the Society will be happy to be at the further expence of carriage of any other fossils with which Serjeant DEAN may have it in contemplation to favor the Museum, from the same deposit.”

Captain CAUTLEY's letter gives the following additional particulars of the fossil bone deposit in the *Sewalik* hills: and of the subterranean town at *Behat*.

“ This is a favorable opportunity of reporting progress on the fossil discoveries of the lower hills (Sewalik), which are going on even more flourishingly than I could have expected, considering that the only means of continuing the search during the rainy months were in carting fragments of the rock from the deposit to my house. The fossils are even now not only numerous, but rich in the remains of a great vareity of species : Saurian and Chelonian, both Emys and Tryonin, are most abundant: of the Saurian, the teeth of two varieties correspond very closely with the existing Alligator (or magari of the natives), and the Gharial (or *Gavial* of naturalists) : there appears to be a third variety of teeth of this order, as well as the jaw-bones of two of a smaller claw of lacertine animals, one specimen of which is exceedingly interesting, consisting of the lower half jaw, with one check-tooth, well fossilized. Of Mammalia, three families are very distinct, Solipeda, Ruminantia, and Rodentia, the former in one solitary specimen of an incisor of some animal of the horse species, the second of a variety of teeth of deer, the thbird of rats; besides these, there are a great variety of teeth, which from want of experience and want of books of reference, I am unable to recognize. Some bones also, about which, for the reasons above mentioned, I can say nothing : two specimens of fisbes' vertebræ, and some undoubted teeth of *Squalus*, or some voracious species,

will give some idea of the present state of my cabinet. Laying aside direct geological reasons, which may hereafter be best referred to, the great variety of remains already found in so short a period makes this discovery valuable. A farther search on the line of mountains, of which the Sewálik may be considered the centre, will, I have no doubt, establish the fact of the existence of these remains on the whole line. Lieutenant DURAND, of the Engineers, on a late visit to Nahun, was fortunate enough to meet with the stratum of marle or clay conglomerate on the north face of the mountain upon which the town of Nahun stands; the remains therein discovered, in my opinion, identify it completely with the Sewálik stratum, the position of both being similar and in juxtaposition with the calcareous sandstone. The fossils in the Nahun deposit, which Lieutenant DURAND has introduced us to, consist of tortoise, saurian, mammalia, and fish, exactly of a similar description to those found at the Kalowála Pass, the enamel equally perfect, and the more solid masses of bone as highly impregnated with (hydrate of) iron. Lieutenant DURAND'S discovery is of particular interest, from its having at once established the formation of the Nahun connecting link, as at this point the low line of mountains skirting the Dhera and Karda Dhúns, impinge upon the great Himálayan chain. Since the discovery of these fossils, I have visited the spot, and am satisfied of the identity of this formation with that of the Sewálik, and have every reason to imagine that an active search will not only shew that a similar deposit exists on the Pinjore line of lower mountains terminating at Rápur; but that equal success may be expected on the left of the Ganges: as this is a mere notice of the progress of these interesting discoveries, it would be out of place to enter upon the matter geologically.—There is a tradition existing, of the remains of giants having been discovered in the neighbourhood of the Pinjore valley, near a village named Samrota, the said giants having been those destroyed by the redoubtable RAMCHANDRA. I have lately seen a tooth and a fragment of a tusk in the possession of Lieutenant W. E. BAKER of the Engineers, which were presented to him by the Nahun Rájá, as the remains of giants, and found near the above village: Lieutenant BAKER will take an early opportunity of sending you drawings of both these fossils, the first a very perfect tooth of an elephant, with the enamel of the flexures in the crown beautifully retained, the other the fragment of a small tusk, I imagine of an elephant also; both of these specimens are completely silicified: and from the appearance of the matrix, small fragments of which are visible in the interstices of the tooth, it would appear to be sandstone, or indurated sand: to those people who have time and leisure to visit Samrota and the Pinjore valley, what a fine field is here opened out for interesting discoveries of the newer organic remains. I think that the circumstance of the existence of a deposite of this sort, either in or near the Pinjore valley, is mentioned by DOW in his History, from Ferishta; the bones having been found in digging a canal, or in the construction of some work, where excavation was necessary\*.

\* The passage in Dow's Ferishta is quoted in the appendix to Professor BUCKLAND'S note on the fossil bones from Ava. As it is short, we copy it, in hopes of its leading to further inquiries for fossils in the Pinjore valley.

“ On the King's return to the capital, in the month of Rajeb, 762, (May, 1360,) he heard that in the vicinity of Perwar, was a hill, out of which issued a stream of water

“Some days hence I will despatch to the Museum some more relics from Behat. Circumstances have prevented a fair opportunity of continuing the search, but there are a few more interesting coins, one of them bearing a distinct inscription, some rings, and a small idol made of either sandstone or composition: a great quantity of small irregular lumps of iron and slag have been found, with some more arrowheads.”

Extracts of a letter from Capt. EDWARD SMITH, Engineers, were read, explaining that he had been induced to postpone furnishing the list of the fossils from the Jumna, presented by him to the Society in December last, by having afterwards received further remains of the same kind in great number and variety, which he is now preparing to dispatch.

“You are I believe aware of the existence of fossils in the Jumna, in a greater abundance than was at first supposed; but I have, notwithstanding my own expectations to that effect, been surprised at the quantities that the last four or five months have produced, and the length of course of the river through which they are found. In the observations that have been made of the situations, only beds in which they have been lodged, there may be obtained some conclusions that the former less exact acquaintance with the place of deposit gave no evidence of. Some of these specimens are of such size that I shall have difficulty in finding an early conveyance for them, which however, I will look out for. I scarcely anticipated, being able to add so largely to those already in your possession; there having this year been no works on the river in parts containing fossils. It was in descending the river, in March last, that searching on the banks I discovered those which are in preparation for you.”

that emptied itself into the Setlej river, which the people called the Sursetti, and that beyond it was a smaller stream denominated Selima.

“It was stated, that if an eminence which intervened between these streams were cut through, the waters of the Sursetti, falling into the smaller stream, would flow on to Sūnam, passing by Serhind and Mausurpur, and that the supply of water would be perennial.

“On this information, the King (FEROZ) proceeded in that direction; and causing fifty thousand labourers to be collected, he employed them in cutting through the mound or hill, so as to form a junction of the two streams. In this mound were found the bones of elephants and men. The bones of the human forearm measured 3 gez, or 5 feet 2 inches, in length. Some of the bones were petrified, others resembled bone.”

We strongly recommend the canal thus cut by FEROZ SHAH, five centuries ago, to a careful elucidation by Captain CAUTLEY. If it still exist, it must afford one of the best situations for studying the direction and nature of the gravel deposits of the lower range, and of their fossil contents. It is seldom that a geologist can command the aid of fifty thousand men to open a section of the Himalayan strata to his view.

The fossil deposits of the north-east extremity of the great range are also well deserving of further examination. It was among the mutilated fragments of bone procured by Mr. COLEBROOKE in Kooch-behar, on the banks of the Brahmaputra river, that Mr. PENTLAND discovered traces of the *Anthracotherium* of CUVIER. It is most probable that the declivities of the lower range in its entire length will afford very numerous tertiary fossil deposits, when it comes to be explored.—ED.



XI.—*Illustrations of the Botany and other branches of the Natural History of the Himálayan Mountains and of the Flora of Kashmir; Part II.* By J. FORBES ROYLE, Esq. F. L. S. and G. S. M. R. A. S. &c.

Mr. ROYLE'S SECOND PART maintains its claim to the praise that the scientific journals of Europe had pronounced upon his first. The introduction continues his general observations on the geographical and geological structure of the great continent of India, drawing, for those portions, which he has not had an opportunity of visiting, his materials from SYKES, CALDER, HODGSON, GERARD, &c. and from HUMBOLDT for the systems of mountains in central Asia. The first plate also exhibits two geological sections of the Himálayan range, and a sketch of the rocks from Shergáti to Rogonáthpur; the former we shall hereafter transfer to our pages when the introductory remarks, which break off at the 12th page, are completed: the latter has been already given in Mr. EVEREST'S notes of a journey to Ghazipur, (GLEANINGS, iii. 129.)

The purely botanical portion of the work commences with the *Ranunculaceæ*, of which nearly a hundred species have been discovered in the Himálayas. Several of them are identical with those of other countries. The Himálayan genera, with one exception, are exactly those enumerated by LEDEBOUR as inhabitants of the Altai mountains: also, with exception of *Helleborus* and *Nigella*, which do not extend either eastward to the Altai or southward to the Himálaya, the same genera are enumerated by MEYER and BIEBERSTEIN as indigenous to the ranges of Taurus and Caucasus.

Our author's observations on the application of the plants of this family in the *Materia Medica* of India are so valuable, that we need offer no apology for extracting them entire. We would willingly follow them up by his remarks on the other natural families *Dilleniaceæ*, *Magnoliaceæ*, *Anonaceæ*, *Menispermaceæ*, *Berberidæ*, &c. but neither our limits, nor justice to the author would permit so extensive a robbery. No one who would be acquainted either with the ornamental, the cultural, or the medical qualities of the Indian Flora, can dispense with the possession of Dr. ROYLE'S highly valuable labours—labours which he is now ushering to the world at great expense to himself and without the same extent of patronage with which the Honorable Company were wont in days of yore to encourage such meritorious works in their servants.

"The *Ranunculaceæ* form a very natural family, not only with respect to structure and geographical distribution, but also in possessing the same sensible properties and modes of action on the human frame. This is owing to their containing in all parts an acrid principle, which KRAFF ascertained to be neither acid nor alkaline, but of so volatile a nature, that in most cases simple drying in the air, or infusion, or decoction in water, is sufficient to destroy it; that its activity is increased by acids, sugar, honey, wine, and spirits, and is only effectually destroyed by water and vegetable acids. (*Fée, Cours. d'Hist. Nat. Pharm.* vol. i. p. 373.) Two vegetable alkalies, *Delpia* and *Aconitia*, the latter little known, are produced by the plants of this family; if the acrid principle be always of the volatile nature that it is represented, the powerful effects attendant on the administration of the root of *Aconitum ferox* even after it had been preserved ten years must be ascribed to the presence of some principle of a more permanent nature. According apparently to the proportion of the acrid principle to the rest of the vegetable substance, or perhaps owing to the peculiar nature of the acrid principle

in each species, it is found that they act either on the system generally, or in different degrees on particular organs. Thus several species of *Ranunculus* are used as rubefacients and vesicatories; while the roots of *Zanthorhiza*, *Coptis*, and *Hydrastis*, as tonics; and those of *Thalictrum majus* as a substitute for rhubarb. *Hellebore* has long been known as a powerful cathartic, and *Aconite* as a no less powerful narcotic and poison; while some from the destructibility of their noxious property by water have been used as food. The Mahomedan physicians in India having derived their knowledge of drugs chiefly from Arabian authors, who translated from the Greek, it is not surprising to find such articles as *Hellebore*, *Pæony*, *Lycoctonum*, and *Stavesacre*, all of which as well as others might be grown in the Himálayas, prescribed in every part of India, though the druggists, calculating upon the ignorance of both practitioners and patients respecting the true drug, generally substitute some which they consider an equivalent. Yet it is interesting to observe, that independent observation has introduced into Indian practice several drugs from this family, to which the same properties are ascribed as in Europe. Thus *Ranunculus sceleratus* is used as a vesicatory. The roots of *Thalictrum foliosum* as a bitter in the cure of fevers—those of *Aconitum heterophyllum* as a tonic, and of *Aconitum ferox*, though a poison, as a narcotic in rheumatism. *Nigella sativa* is alone cultivated in India, as in most eastern countries, and continues in the present day, as in the most ancient times, to be used both as a condiment and a medicine.

The celebrated Indian poison called *Bish* or *Bikh*, being referred by all authorities to *Ranunculaceæ*, requires to be noticed, though it would not be easy, even in the present state of confusion of Indian Materia Medica, to find an article of which it is more difficult to give a satisfactory account, and of which, at the same time, it is so necessary that we should have a clear idea. The subject to be entered into, with the detail which it requires, would claim a much greater space than can be allotted to it here: little more therefore can be done than to state the little that is known, and to urge observers, who may be favourably situated, to prosecute the inquiry.

Dr. BUCHANAN first acquainted the European world with the existence of four kinds of *Bikh*. 1. *Singya Bikh*. 2. *Bish* or *Bikh*, the poison. 3. *Bikhma*, a powerful bitter. 4. *Nirbisi*; also without deleterious properties. The first Dr. B. referred to a species of *Smilax*; the author has had two species of *Convallaria*, called *meetha-doodhya*, and *mohura-doodhya*, represented to him as being of a poisonous nature. The three other kinds of *Bikh* Dr. B. refers to the genus *Caltha*, but for what reason it is difficult to discover, as the flower of the species he describes are without the characteristics of the genus; and the plant, he allows, differs much in habit from *Caltha palustris*. It may be supposed, therefore, that he had only an opportunity of examining the flowers in a young state, and it is known that when he published his description, he was without his specimens. These are now in the East-Indian Herbarium, and have been all referred by Dr. WALLICH to the genus *Aconitum*. The specimens of *Caltha? Nirbisia* and *C.? Codoa* of Dr. BUCHANAN, appear to be Dr. WALLICH'S *Aconitum ferox*, while those of *C.? Bishma*, his *Aconitum palmatum*, all evidently in a young state, and without flowers or fructification. That the virulent poison, emphatically called *Bish*, i. e. the poison, is the root of *Aconitum ferox*, admits, I think, of no doubt. The root is brought down to the plains of India from the mountains where

this plant is indigenous; that it was produced by it was first learnt by Dr. WALLICH in Nepal; the fact was confirmed by Dr. GOVAN in Sirmore, and the information communicated to the author on the same mountains was, that *Bikh* is the name applied to *Aconitum ferox* and *Meetha tellia* to the root, which, though a violent poison, is occasionally used in medicine. It may further be stated, that the specimens of *Aconitum ferox* in the author's Herbarium, have the fusiform roots attached side by side, black and wrinkled externally, and of a brownish colour internally; they impress upon the tongue and fauces a peculiar burning sensation, and increase the flow of saliva, as is described to be the case with the *Bikh*. They moreover exactly resemble the specimens brought in the Indian bazars, of *Meetha tellia*, in the author's collection of Materia Medica.

Both Drs. BUCHANAN and WALLICH have mentioned the uncertainty and confusion existing in the names of the several articles of the Indian Materia Medica. This is no doubt true, and it therefore becomes more necessary to elucidate the subject, when such powerful drugs are sold and administered as remedies for disease. Considerable assistance will be derived in this labour, if, when consulting native works on the subject, we at the same time procure as many as possible of the drugs which are described. Without this no satisfactory progress can be made, as we have no means of ascertaining when the same drug is given in different parts of the country, under different names, nor when, which is sometimes the case, different articles are given under the same name.

Dr. BUCHANAN (*Brewst. Journal*, i. p. 250) gives *Bish*, *Bikh*, and *Kodoya bish* or *bikh*, as the synonymes: to these *Meetha* ought to be added, instead of being referred to *bikkma*. Professor H. WILSON (*Cal. Med. Trans.* vol. ii. p. 280) referring to this article, says, that *Bish*, *Bikh*, or *Vish*, means poison simply, and that it has several Sanscrit synonymes, as *Amritam*, *Vatsanabhu*, *Visham*, &c. Dr. CAREY, in his Bengalee Dictionary, refers *Bish* to *Aconitum ferox*, and quotes as synonymes with *Vatzenabhu*, *Mitha*, or *Mitha zuher* (sweet poison). Dr. W. HUNTER (*Cal. Med. Trans.* vol. ii. p. 410) has *Meetha zuhur*, *Meetha bikh*, and simply *Mitha* as synonymes. Dr. WALLICH (*Plantæ Asiat. Rar.* vol. i. p. 41) mentions that Dr. GOVAN found the root called *Meetha-doodya* and *Meetha telya*, and gives as synonymes, *Visha*, i. e. *Venenum*, et *Ati visha*, *summum venenum*; Hindee, *Vish* or *Bikh*; Newar, *Bikh* and *Bikma*. In the *Mukh-zun-ool-Adwieh*, probably the best Persian work on Materia Medica in use in India, several kinds of *Bish* are enumerated; as—1. *Seengheea*, so called from its resemblance to the horn of a Deer. 2. *Buchnag*, like *judwar*. 4. *Teezuk*. 5. *Kuroon-ool-soombul*. 6. *Buhrasoorut*. 7. *Burhmunee*. 8. *Muhoodah*. 9. *Huldeh*. 10. *Kala koot*. 11. *Sutwa*. 12. *Tellia*. But as it is doubtful whether these are varieties or species, or whether more than those already mentioned, can be referred to the genus *Aconitum*, they are only enumerated as subjects for further inquiry. In the *Taleef-Shereef*, an Indian work on Materia Medica, lately translated by Mr. PLAYFAIR, *Singia* and *Bechnack* are given as two names of a most deadly poisonous root from Nepal, no doubt the Aconite.

In all the native works, the *Bikh* is represented as being a deadly poison, even in the smallest doses. The Hindoo works quoted by Dr. HUNTER describe it as being at first sweetish (hence the affix *meetha*, sweet), and then followed by a roughness on the tongue, or as it is expressed in one work, "seizing the throat."

Dr. BUCHANAN has informed us, that it is equally fatal when taken into the stomach, and when applied to wounds; hence used for poisoning arrows and killing wild animals. The futility of the Gorkhas attempting to poison the springs of water was shown in the last campaign, and Dr. GOVAN has proved the improbability of deleterious exhalations from this plant being the cause of the unpleasant sensations experienced at great elevations, inasmuch as it is only found much below where these are experienced. But as it is a root of such virulent powers, it has no doubt been frequently employed as a poison, and its sale was therefore prohibited by the native powers in India. Notwithstanding this, the Hindoo physicians, noted for the employment of powerful drugs, such as arsenic, nux vomica, and croton, do not hesitate to employ this also in medicine. In the *Taleef-Shereef* it is directed never to be given alone; but mixed with several other drugs, it is recommended in a variety of diseases, as cholera, intermittent fever, rheumatism, tooth-ache, and bites of snakes. It is also used as an external application in rheumatism in the north-western provinces. Mr. PEREIRA'S experiments have shown that this root, either in the form of powder, watery extract, or spirituous extract, is a most virulent poison: but of these forms the last is by far the most powerful. "The effects were tried by introducing this extract into the jugular vein, by placing it in the cavity of the peritoneum, by applying it to the cellular tissue of the back, and by introducing it into the stomach. In all these cases, except the last, the effects were very similar; namely, difficulty of breathing, weakness, and subsequently paralysis, which generally commenced in the posterior extremities, vertigoes, convulsions, dilatation of the pupil, and death, apparently from asphyxia." (*v. Wall. Pl. Asiat. Rar. loc. cit.*)

With respect to the *Bikhma*, or the second kind of *Bish*, the difficulties are greater, as the specimens of *Caltha? Bikhma*, which Dr. BUCHANAN was informed produced the febrifuge root, belong to Dr. WALLICH'S *Aconitum palmatum*, Cat. No. 4723; this may therefore produce a root possessed of the properties ascribed to the *Bikhma* by Dr. BUCHANAN'S informants. Though we have no further information respecting it than its name, properties, and the short description of *Radix tuberosa* to guide us, it is interesting to endeavour if it can be traced in other parts of India, though names, especially provincial ones, we have seen vary in different districts, and the properties ascribed to a drug is rather an uncertain guide in the present state of the Indian Materia Medica; but it appears to be more than an accidental coincidence, that the author, in his inquiries, has met with a *tuberosus root* produced by a species of *Aconite*, which is extensively used in India as a tonic medicine. In the native works on Materia Medica, as well as in the common Persian and Hindoostanee and English Dictionaries, *Atees* is described as being the root of an Indian plant used in medicine. This the author learnt was the produce of the Himálayas: he therefore sent to one of the commercial entrepots situated at the foot of the hills, and procured some of the root, making inquiries respecting the part of the mountains whence it was procured. The plant-collectors in their next excursions were directed to bring the plant, with the root attached to it, as the only evidence which would be admitted as satisfactory. The first specimens thus procured are represented in Plate 13, and the root *Atees* having been thus ascertained to be the produce of a new species of *Aconite*, it was named *Aconitum atees* (*Journ. Asiat. Soc. vol. i. p. 459*), but which has since been ascertained to be the *Aconitum heterophyllum* of Dr. WALLICH. The roots obtained in different parts

of the country resemble one another, as well as those attached to the plant. They are about an inch in length, of an oblong oval-pointed form, light greyish colour externally, white in the inside, and of a pure bitter taste. That its substance is not so injurious as the *Bish*, I conclude from its being attacked by insects, while the other remains sound and untouched. The natives describe it as being of two kinds, one black, the other white, and both as bitter, astringent, pungent, and heating, aiding digestion, useful as a tonic and aphrodisiac. By inquiries in Nepal it might easily be ascertained whether this has any resemblance to the *Bikhma* of Dr. BUCHANAN.

Respecting the third kind of *Bish*, *Nirbisi*, *Nirbishi*, or *Nirbikhi*, the uncertainties are also considerable; as we have only the information that it is a tuberous root without deleterious properties; while Dr. B.'s specimens of *Caltha? Nirbisia* are not to be distinguished from those of his *Caltha? Codoa*, which have been shown to be those of *Aconitum ferox* in a young state. It is evident, therefore, that the people employed did not take the necessary precautions, and, perhaps, brought the leaves of the latter plant, because they thought it was like the true one, and it may therefore be supposed to be one of the *Ranunculaceæ*, particularly as the author, in the mountains of Sirmore and Gurhwal, found the name *Nirbisia* applied to *Delphinium pauciflorum*; and the roots brought down from these mountains with that name have the closest resemblance to the roots of some species of this genus, though he did not succeed in tracing it to the particular one; but that which is reckoned the best kind of *Nirbisi* in the Indian bazars is of a very different nature, and brought down from Bisschur and from Umrutseer, the commercial capital of Lahore. This kind is fusiform, somewhat flattened and wrinkled, of a black colour externally, and in some respects resembling the *Bikh* itself; when cut, the substance is found to be compact, and of a brownish colour, with a slight degree of bitterness and acrimony.

The name *Nirbisi*, with its Persian and Arabic synonymes, *judwar* and *zudwar*, has been already applied by Mr. COLEBROOKE to the roots of *Curcuma Zedoaria*, because they agree pretty well with the round zedoary (*zedoaria rotunda*) of the shops; but that distinguished scholar, with a caution dictated by his extensive knowledge of the subject, observes, that if the drug be not the true zedoary, the synonymes must be transferred to some other plant. The term *Nirbisi*, as observed by Mr. COLEBROOKE, implies that the drug is used as an antidote to poison, being composed of the privative preposition *nir* and *bis*, poison; and in the *Mukhzun-ool Adwiah*, it is further explained, as repelling from and purifying the body from deadly poisons. It may therefore be considered as a medicine of considerable importance in Eastern countries, and that it is not only so at present, but has been reckoned such from very ancient records, will appear from the following quotations. The Arabic synonyme *Zudwar*, leads us at once to the accounts of the *Zedoaria* of old authors and the *Geiduar* of AVICENNA. Thus, MATHIOLUS (*Commentaries on Dioscorides*, lib. ii. c. 154), tells us, "Zedoaria (ut cap. clxxii. testis est Serapio) convehitur e Sinarum regione ultra extremas Indiæ oras;" adding, after giving the medical properties, "et in antidosis additur. Ideoque dixit Avicenna nihil esse ea præstantius ad ebibitum Napellum." GARCÍAS AB ORTA, who was for so many years one of the physicians at Goa, writes: "Quod nos hic Zedoariam appellamus, Avicennæ, lib. ii. cap. 734, Geiduar dicitur; aliud no-

men ignoro, quia nascitur regionibus Sinensium provinciæ vicinis. Magno vero emitur *Geidwar*; nec facile invenias, nisi apud circumforaneos quosdam et circulatores, quos Indi *jogues*, Mauretani *Calandares* appellent, hominum genus quod peregrinationibus et stipem amedicando vitam sustentat. Ab his enim et reges et magnates *Geiduar* emunt." "Utile est autem istud *Geiduar* ad plurima, sed præsertim adversus venena, et virulentorum animalium ictus morsusque." Clusius, at p. 378 of the same work, "*Exoticorum libri decem*," having obtained some specimens, "*Gedwar veri nomine inscriptas*," gives a figure, and compares them with the roots of *Anthora*, which was at one time thought to be the *Zedoary*; they resemble a good deal those of *atees*, as represented in pl. 13. The Persian authors, after giving the synonymes, mention that there are five kinds of *Judwar*. The best, called *Khutai*, or Chinese, procured from the mountains of that country. The two next kinds are the produce of the mountains of Tibet, of Nepal, of Morung, and Rungpore; the fourth kind is from the hills of the *Dukhun*; and the fifth, called *Antulah*, is the produce of Andaloosee, or Spain. A long account follows of the properties and uses of *Judwar*, of which it is needless to adduce more than that it is considered a powerful antidote to poison, particularly of the *bish*; more so, indeed, than the *tiryak farook*, the ingredients of which are given by Prosper Alpinus *De Medicin. Ægypt. lib. iv. c. 9*. It is therefore probable, that the *Nirbisi* is the true *Zedoary* or *Geiduar* of Avicenna, whatever may be the plant which produces it; that it is not likely to have been what is now so called, the produce of a species of *Curcuma*, is evident from the difficulty which GARCÍAS AB ORTA had in procuring it even in India. Further, if the descriptions in the Persian works on *Materia Medica* be compared with those of the old Arabian authors, they will be found to refer to the same article, of which in India the name is *Nirbisi*. It may therefore be recommended as an interesting subject of inquiry for travellers in the Himalayas from Silhet to Cashmere, to ascertain the plant or plants which furnish the different kinds of *Nirbisi*, *Judwar*, *Zudwar*, or *Antuleh*. *Cissampelos convolvulacea* is called *dukhnirbisee* in the N. W. provinces."

Since selecting the above extract for press, the THIRD PART of Dr. ROYLE'S Illustrations has reached India. It contains plates of fourteen new plants;—two zoological; and one plate of the fossil plants of the *Burdwan coal formation*\*. Under the family *malvaceæ*, we find a luminous and highly useful account of the cotton plant and its cultivation in various parts of the world, which we regret having no space to notice further at present. The author has also supplied a desideratum in botany by his monographical epitome of the *gossypia*, which he distinguishes into eight species.

Lieut. ARTHUR CONOLLY'S Overland Journey to India, and Lieut. A. BURNES' Voyage up the Indus and subsequent Mission to Kábul and Bokhárá, have both appeared among the recent arrivals from England. As the Gleanings in Science have already given an epitome of the former journey, and the Journal As. Soc. of the latter, we need say no more than that, both works do credit to our enterprising travellers.

\* What has become of the valuable series of drawings of these fossils prepared from the specimens in the Society's museum by Dr. FÁLCONE three years ago?—ED.

## XII.—Col. SYKES' Catalogue of Birds of the Insessorial Order in the Dukhun.

[Continued from page 423.]

Fam. *Merulidæ*, Vigors.—Genus *Oriolus*, Auct.

58. *Oriolus Galbula*, Linn. *Golden Oriole*, Lath. *Mango Bird* of Dukhun. Very abundant in Dukhun just before the rains. It is called *Pawseh* by the Mah-rattas, from being the precursor of the monsoon. It is a quarrelsome bird. *Irides*, rich lake.
59. *Oriolus melanocephalus*, Linn. *Black-headed Oriole*, Lath. Rare. Seen by Colonel SYKES only in the immediate neighbourhood of the Ghauts. Found also in Africa.
60. ORIOLUS KUNDOO. *Or. corpore suprâ flavo-viridi; uropygio, crisso, pogoniis internis rectricum ad apices, abdominisque lateribus nitidè flavis; alis olivaceo-brunneis; corpore subtus sordidè albo, brunneo striato; rostro nigro. Irides, rufo-brunnæ. Longitudo Or. Galbulæ.* Both sexes alike. Size of *golden Oriole*, and much resembling the female of that bird; but the bill is always black, and the *irides* reddish-brown instead of lake.

Genus *Turdus*, Auct.

61. *Turdus macrourus*, Gmel. *Long-tailed Thrush*, Lath. Rare. Found in the dense woods of the Ghauts.
62. *Turdus Saularis*. *Gracula Saularis*, Linn. *Pastor Saularis*, Temm. *Little Indian Pic*, Edw., pl. 181.
63. *Turdus cyanotus*, Jardine and Selby, pl. 46. This bird has the tongue of a *Pastor*. *Irides*, intense red brown. Stony fruit and *Cicadæ* found in the stomach. Has the naked spot behind the eyes, but the bird has not the air of a *Pastor*. Inhabits the Ghauts.

Genus *Petrocincla*, Vigors.

64. PETROCINCLA PANDOO. *Petr. brunnescenti-cyanea; pteromatibus, remigibus rectricibusque fuscis. Irides, fuscæ. Statura minor quàm Turd. cyanei.* This bird differs from the *solitary Thrush* of Europe (*Turd. cyaneus*, Linn.) in its smaller size, slighter form, brighter cœrulean tint, want of orange eye-lids, and white tips to the feathers. Found only in the dense woods of the Ghauts. Flight, low and rapid. It appears to correspond with var. A. of Dr. LATHAM'S *solitary Thrush*, vol. 5, p. 47.
65. PETROCINCLA MAAL. *Petr. suprâ griseo-brunnea, subtus rufescenti-alba, plumi brunneo marginatis; crisso rufescenti, fusco-brunneo fasciato. Statura præcedentis.* This bird corresponds as closely as possible with what is stated to be the female of the *Turd. cyaneus*, and may by analogy be supposed to be the female of *Petrocincla Pandoo*; but it inhabits only the prickly milk-bushes (*Euphorbia tortilis* and *pentagona*) of the rocky plains of the Dukhun. Colonel SYKES never saw it in the Ghauts, nor in company with *Petr. Pandoo*.
66. *Petrocincla cinclorhyncha*, Vigors, Proceed. Zool. Soc. 1. p. 172. Figured in GOULD'S Century of Himalayan Birds.

Genus *Timalia*, Horsf.

67. TIMALIA MALCOLMI. *Tim. pallidè grisescenti-brunnea, uropygio pallidiori, remigibus rectricibusque mediis saturatioribus, his fusco absolètè fasciatis; subtus albescens, leviter rosaceo tincta; frontis plumis subcyaneis, in medio albo striatis. Irides, flavo-aurantiæ. Rostrum brunneum, mandibulâ inferiori ad basin flavescenti. Longitudo corporis 11½ unc., caudæ 5½.* *Kokuttee* of the Mahrattas. Congregate in flocks of ten or a dozen; fly low, slowly, and with difficulty: never cease chattering, and all at the same time. Food, grasshoppers and grain. Colonel SYKES has dedicated this species to Sir JOHN MALCOLM, G.C.B., who zealously aided his researches in India.
68. TIMALIA SOMERVILLEI. *Tim. rufescenti-brunnea; abdomine, crisso, dorso imo caudæque dilutè rufis, hæc saturatiori absolètè fasciatâ; remigibus brunneis; gutturis pectorisque plumis in medio subcyaneo notatis. Rostrum pedesque flavi. Longitudo corporis 9½, caudæ 4½. Irides, pallidè flavæ.* A size less than *Tim. Malcolmii*, but shorter. *Irides*, bright yellow: same habits as the preceding, but found in the Ghauts only; the latter on the plains. Colonel SYKES has dedicated this bird to Dr. WILLIAM SOMERVILLE, F.R.S. in testimony of his respect.
69. *Timalia Chataræa*, Frankl. *Gogoye Thrush*, Lath.? Habits of the preceding, but about half the size of *Tim. Malcolmii*. *Irides*, red brown, legs, yellow.

Genus *Ixos*, Temm.70. *Ixos jocosus*. *Lanius jocosus*, Linn. *Jocose Shrike*, Lath.This is also the *Lanius Emeria* of SHAW. The male has a sweet note. Found only in the lofty woods of the Ghauts. Irides, fuscous. Lives on fruit: sexes alike.71. *Ixos Cafer*. *Turdus Cafer*, Linn. *Cape Thrush*, Lath. *Le Courouge*, Le Vaill.

Inhabits gardens: destructive to fruit: without musical notes. Sexes alike.

72. *Ixos fulicatus*. *Motacilla fulicata*, Linn. *Sooty Warbler*, Lath. *Traquet noi des Philippines*, Buff.

Sir J. ANSTRUTHER's variety. Lath., vol. 7, p. 112. Female, sooty-black, or brown-black.

Genus *Pomatorhinus*, Horsf.73. POMATORHINUS HORSFIELDII. *Pom. olivaceo-brunneus*; *strigá superciliari, collo in fronte, pectore, abdominique medio albis.**Irides*, fusco-sanguineæ. *Rostrum flavum. Pedes fuscí. Longitudo corporis 9.7 unc., caudæ 3.7.*Minute insects (Dipterous) found in the stomach. Birds remarkably shy, and only met with in the dense woods of the Ghauts. The note of the male is *hoot*, *whoot*, *whoot*, uttered slowly: the female answers *hooe*. The tongue and habits of this bird are those of a *Thrush* or *Timalia*. I have dedicated this species to a gentleman to whom science is deeply indebted.Fam. *Sylviadæ*, Leach.—Genus *Jora*, Horsf.74. *Jora Tiphia*. *Motacilla Typhia*, Linn. Lath., vol. 7, p. 128, var. A. BROWN'S *Illust.* pl. 36.Dr. Horsfield's *Jora scapularis* appears to correspond with the female of *Jora Tiphia*. *Irides*, gray.Genus *Sylvia*, Auct. *Warbler*.75. *Sylvia montana*, Horsf. *Prinia montana*, Swains.Differs from the type of *Prinia* in its rounded tail. *Irides* fuscous.76. *Sylvia sylviella*, Lath. *Lesser White-throat*.

Differs from the European bird only in the reddish tint of the white below.

77. SILVIA RAMA. *Sylv. pallidè brunnea, subtus albescens*; *caudá obsoletè fasciatá. Longitudo corporis 4.7, caudæ 1.9.*Sexes alike. A size smaller than *Sylv. montana*, and might be mistaken for it: but Colonel SYKES has shot them male and female, in several places in Dukhun, full-grown birds.Genus *Prinia*, Horsf.78. PRINIA SOCIALIS. *Prin. capite dorsoque intensè cinereis*; *remigibus rectricibusque rufo-brunneis, his prope apices fusco-fasciatis*; *subtus rufescenti-alba, abdominis lateribus saturatoribus.**Rostrum nigrum. Pedes flavi. Irides pallide aurantiacæ. Longitudo corporis 5.2, caudæ 2.2.*Sexes alike in size and plumage. This species constructs the same ingenious nest, and has the same habits, same note (*tooe tooe*), and feeds in the same manner, as the *Orthotomus Bennettii*.79. PRINIA INORNATA. *Prin. suprâ pallidè cinereo-brunnea, strigá superciliari corporeque subtus albescentibus, abdominis lateribus crissoque rufescentibus*; *caudá obsoletè fasciatá.**Irides rufo-brunneæ. Rostrum brunneum*; *mandibulá inferiori ad basin flavá. Longitudo corporis 4.7 unc., caudæ 2.7.*Sexes do not differ in size or plumage. Habits of *Prin. socialis*. Both the above species are remarkable for a struggling flight, as if they experienced difficulty in making their way.Genus *Orthotomus*, Horsf. *Tailor Bird*.80. ORTHOTOMUS BENNETTII. *Orth. olivaceo-viridis*; *subtus albidus*; *capite suprâ ferrugineo*; *caudá elongatá obsoletè fasciatá.**Irides flavæ. Longitudo corporis 6 unc., caudæ 2.7.*Two central tail-feathers elongated beyond the rest for one inch, and two-tenths of an inch wide only. Sexes alike. This bird is very remarkable for the ingenuity shown in constructing its nest, by sewing the leaves of trees together, with cotton thread and fibres. Colonel SYKES has seen nests in which the thread used was literally knotted at the end. This species very closely resembles Dr. HORSFIELD's *Orth. Sepium*, but on a comparison of the birds, they were found to have specific differences.81. ORTHOTOMUS LINGOO. *Orth. olivaceo-brunneus, subtus sordidè albus. Longitudo corporis 5.6 unc., caudæ 2.1.*



This species differs from the type of *Orthotomus* in the short tail, but has the characters of the genus sufficiently marked to be included in it. Sexes exactly alike in plumage. Principal food, black ants.

Genus *Budytes*, Cuv.

82. *Budytes citreola*. *Motacilla citreola*, Lath. This is the variety A. of *Mot. citreola* of Dr. LATHAM, vol. 6. p. 330.

Length 6.7 inches : tail 2.8.

This bird so closely resembles the European species, that Colonel SYKES has not ventured to separate it. It has the habits of a *Motacilla*, but its long hind claw sufficiently distinguishes it, and M. CUVIER has facilitated research in forming a genus for such *Wagtails* as have this claw.

83. *BUDYTES MELANOCEPHALA*, *Bud. olivaceo-viridis*; corpore subtus nitidè flavo; capite, nuchâ, reatricibusque nigris, herum duabus lateralibus albo marginatis; alis fuscis, plumis olivaceo-flavo notatis.

Irides intensè rufo-brunnæ. Longitudo corporis 6.8 unc., caudæ 3.

These are solitary birds, and are rarely found, excepting in the beds of rivers. In seven specimens four birds only were examined, and they happened to be males; so that Colonel SYKES is uncertain with respect to the female.

84. *BUDYTES BEEMA*. *Bud. olivaceo-iridis, subtus flavus*; capite suprâ griseo; strigâ superciliari albâ; alis fuscis plumis flavescenti marginatis; caudâ atrâ, reatricibus duabus lateralibus albis.

Irides flavo-brunnæ. Statura præcedentis.

This bird very closely resembles *Budytes flava* of Europe, but differs in the shade of the upper plumage, in the hind claw being two-tenths of an inch longer, and in the base of the lower mandible being whitish. This is a solitary bird in beds of rivers: female not known.

Genus *Motacilla*, Auct.

85. *Motacilla variegata*, Steph., vol. 13, p. 234. *Pied Wagtail*, Lath., vol. 6, p. 320, pl. 114. *Mot. picata*, Frankl.

86. *MOTACILLA DUKHUNENSIS*. *Mot. dorso scapularibusque pullescenti-griseis, caudæ reatricibus ad apicem nigrescentibus*; capitè suprâ, nuchâ, gutture, pectore, reatricibusque mediis atris; frontis fasciâ latâ, corpore subtus, plumarum marginibus, alarum remigibus primariis exceptis, reatricibusque duabus lateralibus albis; remigibus fuscis.

Irides intense rufo-brunnæ. Statura *Mot. albæ*.

Sexes do not differ in size or plumage; but young birds have the black less pronounced. This is the most common and abundant *Wagtail* in the Dukhun, frequenting not only the beds of rivers, but the plains; and Colonel SYKES has seen it in his own garden frequently. It very closely resembles the *Mot. alba*, of Europe, but differs in being of a light slate or cinereous instead of a blackish cinereous, and in the wing-coverts and secondaries being edged with broader white. It is almost identical with the *Mot. alba* of the Northern Expedition.

Genus *Megalurus*, Horsf.

87. *MEGALURUS ? RUFICEPS*. *Meg. olivaceo-brunneus, subtus albescens, pectore brunneo striato*; capite genisque brunnescentirufis, strigâ superciliari rufescente; capitè dorsique plumarum rhachibus pallidioribus; rostro pedibusque luteis.

Longitudo corporis 7.5 unc., caudæ 2.2.

Wings short: tail equal, narrow. Female unknown. Black ants only found in the stomach. This bird has the air of the *Anthus Richardi* figured in the *Planches coloriées*, 101. Frequents the plains only, like a *Lark*.

Genus *Anthus* Bechst. *Pipit*.

88. *ANTHUS AGILIS*. *Anth. olivaceo-brunneus; subtus rufescenti-albescens, fusco-brunneo striatus*; remigibus flavo-olivaceo marginatis; ungue postico subelongato, subcurvato.

Irides fusco-sanguinæ. Longitudo corporis 6.8 unc., caudæ 2.5.

Found on open stony lands: female unknown. Closely resembles the *Tillark* of Europe. Its chief difference is in the hind toe.

Genus *Saxicola*. Bechst. *Wheatear*.

89. *Saxicola rubicola*, Temm. *Stone Chat*.

Irides intense brown. These birds were met with only in low scattered bushes. Caterpillars, flies and ants found in the stomach.

90. *SAXICOLA BICOLOR*. *Sac. atra; fasciâ alarum, uropygio, abdomine medio, crissoque albis*.

Rostrum pedesque nigri. Irides fuscæ. Longitudo corporis 5.8 unc., caudæ 2.4. Female unknown. Three males were examined. Black ants, caterpillars and beetles were found in the stomach. Habits of the preceding.

91. *SAXICOLA RUBECULOIDES*. *Sax. cinereo-brunnea, subtus alba; gula thoraceque rufis; nectricibus mediis nigrescentibus, cæteris ad basin albis. Irides intensè brunneæ. Longitudo corporis 4.7 unc., caudæ 2.*

92. *SAXICOLA ERYTHROPYGIA*. *Sax. fusco-brunnea; subtus rufo-brunnea, abdomine fusco cæc striato; uropygio rufo; crisso rufo tincto. Statura Sax. bicoloris. Male unknown.*

Genus *Phœnicura*, Jard. & Selb.

93. *Phœnicura atrata*, Jard. & Selb. *Indian Redstart*, *Id.*

This bird is of the size of the *Redstart* of Europe, and has the same habits. It has a very peculiar manner of vibrating its tail when seated on a bough, as if it had an ague fit. A pair of these birds built their nest in an outhouse constantly frequented by Colonel SYKES's servants, and within reach of the hand. They had no alarms.

94. *Phœnicura Suecica*. *Motacilla Suecica*, Linn.

Not differing from the European bird. *Irides* deep brown. Length 5.9 inches; tail 2.

Fam. *Pipridæ*, Vigors.

Genus *Parus*, Linn. *Titmouse*.

95. *Parus atriceps*, Horsf. *Mésange Cap-nègre*, Temm., Pl. Col. 287. f. 2.

96. *Parus xanthogenys*, Vigors, *Proceedings Zool. Soc. I. p. 23.* Figured in GOULD'S 'Century of Himalayan Birds.'

*Irides* sienna brown. Tongue divided into four short *laciniæ* at the tip. Wasps, bugs, grass seeds, and the fruit of the *Cactus Opuntia* were found in the stomachs of both species.

Tribus *CONTROSTRES*, Cuv.

Fam. *Fringillidæ*, Vigors - Genus *Alauda*, Auct.

97. *Alauda Gulgula*, Frankl.

This is the common *Lark* of the Dukhun, with the habits and notes of the *Sky-lark* of Europe. When confined in a cage and shrouded from the light, it learns to imitate the notes of other birds, and even quadrupeds. The male is crested. It is called *Chundoola* in Dukhun. *Irides* sepia brown. Length 6.7 inches; tail 2.3 Food, grasshoppers.

98. *ALAUDA DEVA*. *Al. rufescenti-brunnea brunneo intensiori notata; corpore subtus stridque superciliari rufescenti-albis, pectore brunneo striato; capite cristato, brunneo striato; rectricibus brunneis rufo marginatis. Statura minor quàm præcedentis.*

99. *ALAUDA DUKHUNENSIS*. *Al. corpore suprâ griseo-brunneo, plumis in medio fusco-brunneo notatis; subtus albescens, pectore stridque superciliari rufescentibus; rectricibus fusco-brunneis duabus lateralibus albo marginatis.*

*Irides* intensè brunneæ. Longitudo corporis 6.3 unc., caudæ 2.

Grass seeds only found in the stomach. Frequents stony plains.

Genus *Mirafra*, Horsf.

100. *Mirafra phœnicura*, Frankl.

This bird is characterized by the lightness, shortness, abruptness, and sudden ascents and descents of its flight. *Irides*, yellow-brown. Granivorous.

Genus *Emberiza*, Auct. *Bunting*.

101. *Emberiza melanocephala*, Scop.

This native of Corfu is common to Western India. It appears in considerable flocks at the ripening of the bread grain *Jowaree* (*Andropogon Sorghum*) in December. *Irides*, intense brown. Length, 7.3 inches; tail, 3 inches. Granivorous. Allied to *Emb. lutcola*, Mus. Carls. vol. iv., t. 93.

102. *Emberiza hortulana*, Linn. *Red-brown Bunting*.

This, although not absolutely identical, is so closely allied to the European bird, that Colonel SYKES cannot separate it. *Irides*, intense brown. Length, 7.1 inches; tail 3 inches. Grass seeds only found in the stomach. Bird, solitary.

103. *Emberiza cristata*, Vigors, *Proceed. Zool. Soc. I. p. 35.*

Length 6½ inches: tail 2.7 inches. Rare in Dukhun, and found only on rocky and bushy mountains. Female of a uniform sooty brown. Grass seeds only found in the stomach. Native of China and Nepal as well as Dukhun,

104. *EMBERIZA SUBCRISTATA*. *Emb. suprâ intensè brunnea, plumis brunneo pallidiori marginatis; subtus pallidè brunnea, fusco striata; alarum plumarum rectricumque lateralium marginibus, rectricibusque duabus mediis castaneis; capite subcristato. Irides intensè brunneæ. Rostrum rufo-brunneum. Longitudo corporis 6.6 unc., caudæ 2.5.*

Sexes alike in size and plumage. Birds rare and solitary, and found only in the open spaces on high mountains. This bird is pronounced in Europe to be the

female of *Emb. cristata*; but setting aside the fact of both sexes of each bird being in the present collection, their localities are different, and they were never seen together by Colonel SYKES.

Genus *Linaria*, Bechst. *Linnet*.

105. *Linaria Amandava*. *Fringilla Amandava*, Linn.

These beautiful little birds, so common in Goojrat, are rare in Dukhun.

Genus *Ploceus*, Cuv. *Weaver Bird*.

106. *Ploceus Philippensis*, Cuv. *Philippine Grosbeak*, Lath.

The *Weaver Bird* is very common in Dukhun, and there are few wells overhung by a tree where their nests are not seen pendent. They live in small communities, and are very noisy in their labours. They associate so readily with the *common Sparrow* that at the season of the falling of the grass seeds Colonel SYKES, in firing into a flock of *Sparrows* on the grass plats in his own grounds, killed as many *Weaver Birds* as *Sparrows*. Fruit of the *Ficus Indica* and grass seeds have been found in the stomach. *Irides*, intense brown.

107. *Ploceus flavicollis*. *Fringilla flavicollis*, Frankl.

This bird has so nearly the bill, tongue, *irides*, size and aspect of *Ploc. Philippensis*, that Colonel SYKES has considered it a *Ploceus*. Grass seeds and a few grains of rice found in the stomach. Very rare in Dukhun.

Genus *Fringilla*, Auct. *Finch*.

108. *Fringilla crucigera*, Temm., Pl. Col. 269. fig. 1. *Duree Finch*, Lath.

This minute bird has the strange habit of squatting on the high roads and almost allowing itself to be ridden over ere it rises. Smaller than a *Sparrow*. *Irides*, red brown. Coleopterous insects, maggots, and seeds of *Panicum spicatum* found in the stomachs of many specimens. This bird has the straight hind claw of a *Lark*, and should therefore neither be classed as a *Fringilla*, agreeably to M. Temminck, nor as a *Passer*, agreeably to Brisson. Its habits also separate it from both these genera. M. Temminck in his Plate has placed it on a twig, but it never perches.

Genus LONCHURA.

*Rostrum* forte, breve, latum, altitudine ad basin longitudinem æquans; *mandibulis* integris, superiori in frontem angulariter extendente, cumque eo circuli arcum formante.

*Alæ* mediocres, subacuminatæ; *remigibus*, 1mâ brevissimâ subspuriâ, 2dâ 3tiâ 4tâque ferè æqualibus longissimis.

*Cauda* gradata, lanceolata; *rectricibus* mediis cæteras pauldè longitudine superantibus.

*Pedes* mediocres, subgraciles.

The peculiar spear-head form of the tail, and the ridge of the upper mandible and the forehead, forming a segment of the same circle, together with the habits of the following species, afford sufficient characteristics to justify their separation from the genus *Fringilla* of M. Temminck. The *Gros-bec longicorne* of the Pl. Col. 96. (*Emb. quadricolor*, Lath.) belongs to the same group.

109. *Lonchura nisoria*. *Fringilla nisoria*, Temm. *Gros-bec épervin*, Pl. Col. 500. Fig. 2. Found only in the Ghauts. Grass seeds in the stomach. Length 5.4 inches: tail 1.9 to 2 inches. Sexes alike.

110. LONCHURA CHEET. *Lonch. pallidè cinnamomeo-brunnea*; corpore subtùs uropygioque albis; *remigibus* *rectricibusque* intensè brunneis.

Fam. coloribus minùs intensis.

*Irides*, intensè rufo-brunneæ. Longitudo corporis 5.4 unc., *caudæ* 2.

Tail lanceolate; central feathers longer than the rest, and ending in a point. Sexes alike. These birds live in small families. Colonel SYKES has frequently found them in possession of the deserted nests of the *Ploceus Philippensis*; but their own nest is a hollow ball of grass. Ten white eggs, not much larger than peas, were found in a nest. The cry of the bird is *cheet, cheet, cheet*, uttered simultaneously by flocks in flight.

111. *Lonchura leuconota*. *Fringilla leuconota*, Temm. *Gros-bec leuconote*, Pl. Col. 500. Fig. 1.

Found only in the Ghauts. Length 4.8 inches, inclusive of tail 1.8 inch. Sexes alike. Grass seeds only found in the stomach.

Genus *Passer*, Auct.

112. *Passer domesticus*, Briss. *Fringilla domestica*, Linn.

On submitting the *Indian Sparrow*, male and female, to a rigid comparison with *Sparrows* shot in the Regent's Park, they were found to be absolutely identical.

Fam. *Sturnidæ*, Vigors.—Genus *Pastor*, Temm.

113. *Pastor tristis*, Temm. *Gracula tristis*, Lath.

The *irides* are red brown, and remarkable for being studded on the external margin with regularly arranged yellowish-white specks. Sexes alike : omnivorous : quarrelsome, noisy. Length 11.9 inches, inclusive of tail of 3.5.

114. *PASTOR MAHRATTENSIS*. *Past. supra griseo-niger, remigibus caudaque saturatioribus ; capite genisque atris ; corpore subtus subrufescenti-griseo ; crisso pallidiori, plumis albo marginatis. Rostrum pedesque flavi. Irides, pallidè griseæ. Longitudo corporis 9.6 unc. caudæ 2.9.*

Sexes alike. Found only in the Ghauts. Stony fruit in the stomachs of three birds. Resembles *Past. tristis*, but is a size less, possesses no crest, and has gray *irides*.

115. *Pastor roseus*, Temm. *Turdus roseus*, Linn.

*Irides*, intense red brown. Tongue bifid and fringed : not quite so much so as *Hypsipetes Ganessa*. These birds darken the air by their numbers at the period of the ripening of the bread grains, *Andropogon Sorghum*, and *Panicum spicatum*, in Dukhun, in December. Colonel SYKES has shot forty or fifty at a shot. They prove a calamity to the husbandman, as they are as destructive as locusts, and not much less numerous.

116. *Pastor Pagodarum*, Temm. *Turdus Pagodarum*, Gmel. *Gracula Pagodarum*, Shaw, vol. 7. p. 471. *Le Martin Brame*, Le Vail., Ois. d' Afr. pl. 95. tom. 2.

*Irides*, greenish white. Length 8.5 inches, inclusive of tail of 2.5 to 3 inches. Sexes alike. These birds are great frequenters of the *Ficus Indica*, *Ficus religiosa*, and *Cactus Opuntia*, for their fruit. Insects also are found in the stomach. Birds lively and elegant in flight.

Fam. *Corvidæ*, Leach.—Genus *Corvus*, Auct.

117. *CORVUS CULMINATUS*. *Corv. supra splendenti-ater ; subtus fuliginoso-ater ; rostri culmine elevato.*

Longitudo corporis 14 unc., caudæ 7.

Smaller than the European *Crow*. These birds are remarkable for their audacity. Bill with a considerable *culmen*.

118. *Corvus splendens*, Vieill. *Common Crow* of India.

This is no doubt Vieillot's *splendid Crow*, but in the thousands Colonel SYKES has met with he never saw the plumage ornamented with the pronounced green and blue in Vieillot's plate. Has the noisy, impudent, and troublesome habits of the English *Crow*. Length 18 inches, inclusive of tail of 6 inches. A wounded *Crow* was put into the cage with a *Viverra Indica*, in the expectation that the latter would make a meal of it. The *Crow* however stood so vigorously on the defensive, that a treaty of peace ensued, and they lived amicably together for several weeks, the *Crow* partaking of the food of the *Civet* until it died from its wound.

Genus *Coracias*, Linn. *Roller*.

119. *Coracias Indica*, Linn. *Coracias Bengalensis*, Steph. *Blue Jay from the East Indies*, Edw. pl. 326.

Very common in Dukhun. Called *Tas*, from its note, by the Mahrattas. Sexes do not differ in size or plumage. *Irides* intense red brown. A grasshopper 2.5 inches long was found in the stomach of one bird. Length 13.3 inches, inclusive of tail of 4.7 inches.

Fam. *Buceridæ*, Leach.

*Hornbills* are by no means rare in Dukhun, but from accident Colonel Sykes had not a specimen to produce.

Tribus SCANSORES, Auct.

Fam. *Psittacidæ*, Leach.—Genus *Palæornis*, Vigors.

120. *Palæornis torquatus*, Vigors.

Appear in considerable flocks in Dukhun, and are very destructive to the crops, particularly to the *Carthamus Persicus*. Fond also of the fruit of the *Melia Azadirachta*. The female differs from the male only in wanting the collar, and has in consequence been considered to belong to a different species. The Mahrattas call the bird *Ragoo* and *Keeruh*. Length 17½ inches, inclusive of tail of 9½ inches.

121. *PALÆORNIS MELANORHYNCHUS*. *Pal. viridis, corpore subtus, notâ circumoculari, dorsoque imo pallidioribus ; capite, collo in fronte nuchâque, columbino-canis ; rostro, torqueque collari latâ nigris ; fronte, remigibus, reatricibusque mediis cyaneis, illo pallidiori ; reatricibus subtus, apicibusque supra flavis.*

*Irides*, albæ, subflavo-marginatæ. Longitudo corporis 14.6 unc., caudæ 7.6.

Found only in the Ghauts. Sexes alike. This bird has the aspect of *Pal. columboides*, but differs in the black bill, broad black collar, pale green yellow beneath instead of dove colour, and in the want of the metallic green narrow collar and bluish rump.

Fam. *Picidæ*, Leach.—Genus *Bucco*, Linn. *Barbet*.

122. *Bucco Philippensis*, Gmel. *Burbu des Philippines*, Buff.

This well known bird is called *Tambut*, or the *Coppersmith*, by the Mahrattas. It sits on the loftiest and extreme twigs of trees, uttering the syllables *took took*,

took, deliberately, and nodding its head at each took, the sound and the motion originating the idea of a coppersmith at work hammering. *Irides*, lake colour. Length  $6\frac{1}{2}$  inches, inclusive of tail  $1\frac{1}{2}$  inch. Fruit and insects found in the stomach.

123. *Bucco caniceps*, Frankl.

Scarcely distinguishable from *Bucco corvinus* and *Bucco Javanicus*. Found only in the dense woods of the Ghauts. Its note is quite startling, and makes the hills echo. *Irides*, red deep brown. Length 8.7 inches, inclusive of tail of 2.7 inches: the bird is consequently smaller than Major FRANKLIN'S. Stony fruit only found in the stomach.

Genus *Picus*, Linn. Woodpecker.

124. *Picus Mahrattensis*, Lath. Mahratta Woodpecker, Id.

*Irides* rich lake. Length 7.4 inches, inclusive of tail of 2.4 inches. Although this is called the Mahratta Woodpecker, Colonel SYKES met with three birds only in Dukhun during six years.

Fam. *Certhiidae*, Leach.—Genus *Upupa*, Linn. Hoopoe.

125. *Upupa minor*, Shaw. La Huppe d' Afrique, La Vaill.

*Irides*, almost black. Length 12 to  $12\frac{1}{2}$  inches, inclusive of tail from 4.3 to 4.5 inches. Feeds on the ground, and does not hop.

Fam. *Cuculidae*, Leach.—Genus *Leptosomus*, Vieill.

126. *Leptosomus Afer*. *Cuculus Afer*, Gmel. Edolian Cuckoo, Shaw. *Cuculus Edolius*, Cuv. *Cuc. surratus*, Shaw?

*Irides*, reddish deep brown. Length 13.4 inches, inclusive of tail of 6.6 inches. Rare in Dukhun.

Genus *Eudynamys*, Vigors & Horsf.

127. *Eudynamys orientalis*. *Cuculus orientalis*, Linn. Female *Cuc. Mindanensis*.

Called *Koel* or *Koel* by the Mahrattas. A well known and noisy bird, with singularly loud notes, not at all like those of a Cuckoo. *Irides*, rich lake. Length 17 inches, inclusive of tail of 7 inches. These birds are frugivorous. In the stomachs of many the fruits of the *Bergera Koenigi* and *Ucaria undulata* only were found. The difference in the plumage of the sexes is very remarkable. The female is the larger bird. The tongue of this bird is exactly that of the *Cuc. canorus*.

Genus *Cuculus*, Auct.

128. *Cuculus canorus*, Linn. Common Cuckoo, Lath.

*Irides*, yellow. Length 14.5 inches, inclusive of tail of 6.5 inches. Rare in Dukhun.

129. *Cuculus fugax*, Horsf. Bychan Cuckoo, Lath.

*Irides*, bright yellow. Length 13.8 inches, inclusive of tail of 6 inches. Tongue as in 127. This bird has so much the aspect of a Hawk that Colonel SYKES passed it for one, until its note *koel, koel*, exactly resembling that of *Eudynamys orientalis*, recalled him to the tree on which it was seated, and he shot the bird.

Genus *Centropus*, Ill. Coucal.

130. *Centropus Philippensis*, Cuv. Coucou des Philippines, Buff. Chestnut-winged Coucal, Lath. Malabar Pheasant of Europeans.

*Irides*, rich lake. Length  $19\frac{1}{2}$  inches, inclusive of tail of  $11\frac{1}{2}$  inches. This is a very useful bird, as Colonel SYKES found a snake eight inches long, centipedes, noxious insects, and lizards in the stomach. In the stomach and *oesophagus* of one bird a lizard thirteen inches long was found.

Tribus TENUIROSTRES, Cuv.

Fam. *Meliphagidae*, Vigors.—Genus *Chloropsis*, Jard. & Selb.

131. *Chloropsis aurifrons*, Jard. & Selby?

Fam. *Cinnyridae*, Vigors.—Genus *Cinnyris*, Cuv. Sun-bird.

132. *Cinnyris lepida*. *Certhia lepida*, Sparrm. *Nectarinia lepida*, Temm.

*Irides*, red brown. Length 4.8 inches, inclusive of tail of 1.5 inch. Female ashy brown above; light yellow below. Common in Dukhun. Feed on small insects; also suck honey.

133. *Cinnyris currucaria*. *Certhia currucaria*, Linn. Grimperau gris des Philippines, Pl. Enl. 576. f. 2.

This has been considered a young bird; but Colonel SYKES can venture to affirm from a long observation of its habits in his garden at Poona, that it is a species. *Irides*, bright lake. Length 4.9 inches, inclusive of tail of 1.5 inch. A spider, a Cicada, and minute Coleopterous insects were found in the stomach of many birds of this species. They also hover before flowers, and suck the honey while on the wing, like the *Cinn. lepida*.

134. CINNYRIS VIGORSII. *Cinn. collo supra, nucha, ptilis, scapularibusque intense sanguineis, collo infra pectoreque coccineosanguineis; strigâ nutrinque mental sub- rictu ad pectus extendente maculâque auriculari splendide violaceis; capite supra,*

*caudæ tectricibus, rectricibus mediis, lateraliumque, externo excepto, pogoniis externis metallicè viridibus; alis, rectricibus lateralibus, dorsi inferiori lateribus, fuscis, fuscis subpectoralibus fuscis; abdomine griseo; dorso imo sulphureo.*

*Irides, intensè brunneæ. Longitudo corporis 5½ unc., caudæ 2 3.*

*Larvæ* of flies, a spider, ants, and minute insects found in the stomach. Inhabits only the lofty trees of the dense woods of the Ghauts.--“ I will here beg leave to speak in the first person. I have dedicated this magnificent bird to a gentleman whose enlarged views of natural affinities in zoology have contributed essentially to enhance the value of the science, and to facilitate the labours of every zoologist. The dedication is also influenced by a desire to testify my sense of the many kind attentions of Mr. VIGORS.”—W. H. S.

135. *CINNYRIS MINIMA. Cinn. capite nuchæque olivaceo-viridibus; pectoris nolis, dorso, scapularibus, uropygioque intensè sanguineis, hoc violaceo splendenti; subtus pallide flavâ; alis caudæque fusco-brunneis.*

*Fœm. olivascens-brunnea, uropygio rufa.*

*Irides, rufo-brunneæ. Longitudo corporis 3.3 unc., caudæ 1.2.* Met with only in the dense woods of the Ghauts. White ants and *larvæ* of flies were found in the stomach. One bird was seen sucking honey. Female of a uniform brown, with a patch of brick-red on the rump and upper tail-coverts, and the yellow below fainter than in the male. Colonel SYKES believes this to be the smallest of the *Sun-birds*.

136. *Cinnyris Mahrattensis. Certhia Mahrattensis, Shaw. Cinnyris orientalis, Frankl.*

Dr. Latham does not mention the crimson joined to the yellow spot under the wing.

These birds suck flowers while hovering on the wing; they eat minute insects also.

Female not met with. Length 4.9 inches, inclusive of tail or 1.5 inch

137. *CINNYRIS CONCOLOR. Cinn. viridi-olivacea, alis caudæque saturatioribus, corpore subtilius pallidiori.*

*Irides, intensè rufo-brunneæ. Longitudo corporis 4 unc., caudæ 1.*

Insects with long *antennæ* were found in the stomach. As four specimens obtained by Colonel SYKES were all females, and as they were met with in the same locality as *Cinn. Vigorsii*, *Cinn. concolor* may be the female of that splendid species; but the difference in the size, form, and aspect of the bird, independently of colour, is opposed to this: they were never seen together. The bird has the outline of *Cinn. Mahrattensis*. The specific appellation of *concolor* is given provisionally.

Colonel SYKES, in concluding his notice of the birds of the two first Orders, observed, that in the majority of instances his knowledge was derived from an observation of many specimens of the same species in the living state. For the most part also he had obtained both sexes, and was very rarely confined to a single specimen.

#### *Two new species of Indian Mouse.*

On June 26, 1832, Colonel SYKES presented two specimens of *mus* preserved in spirits, of which the following is the description printed in the *Zool. Journal*.

1. *MUS OLERACEUS.* The upper surface is thickly clothed with rather long smooth silky hairs of a bright pale chestnut colour; on the under surface and the inside of the limbs the quality of the hairs is the same, but their colour is nearly white with a yellowish tinge. This latter colour extends up the cheeks, round the mouth and the under surface of the muzzle, and over the upper surface of the feet; the hairs on the latter, on the muzzle, and on the long scaly tail, being very short. The ears are rather large, rounded above, and very nearly naked. The muzzle is rather short and obtuse, and the eyes are placed at an intermediate distance between its end and the base of the ears. The moustaches are numerous and long, some of them being black, and others, silvery or bright chestnut.

The extreme length of the tail, as compared with that of the body, and the comparative length of the hinder *tarsus*, furnish characters sufficient to distinguish this *Indian field Mouse* from all its congeners.

2. *MUS PLATYTHRIX.* The head is rather flat and the muzzle slightly elongated and acute; the tail regularly ringed with scales, from between which only a few scattered hairs make their appearance. The fur of the upper surface is of a light grey at the base; but the longer hairs have a blackish shade, with an intermixture of testaceous brown, which is more obvious posteriorly and towards the lower part of the sides. The flattened spines, which are numerous, are white and transparent throughout the greater part of their length, with a dark margin and blackish acuminate tip, beneath which they exhibit, in certain lights, somewhat of a changeable gloss. The moustaches are few in number, black at the base and white at the tips, and reach beyond the ears, which are naked, rounded with a slight point, extremely open, membranaceous, and of a dusky black. The whole under surface, together with the insides of the limbs, the upper surface of the feet, and the claws, are of a yellowish or dirty white. The tail is of a uniform livid grey, but little darker above than beneath, and tapering to a very fine point.

*Meteorological Register, kept at the Assay Office, Calcutta, for the Month of October, 1834.*

Days of the Month	Barometer reduced to 32° Fahr.				Thermometer in the Air.				Depression of Moist-bulb Thermometer.			Hair Hygro-meter.		Rain. Inches.	Wind.		Weather.	
	At 4 A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	Minimum	At 4 A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	At 10 A.M.	At 4 P.M.	At 4 P.M.	Morning.		Noon.	Morning.	Noon.	Evening.
1	.684	.828	.680	.773	83.0	86.7	84.4	83.3	1.9	5.0	4.5	96	o.	o.	clear.	cumuli.	clear.	
2	.757	.830	.662	.787	81.1	86.7	87.7	84.1	0.7	5.0	7.7	87	o.	o.	do	clear.	do	
3	.815	.834	.783	.838	81.8	86.8	87.5	82.2	0.8	5.1	8.2	89	o.	o.	do	fine.	do	
4	.821	.898	.800	.852	81.0	84.1	85.4	80.6	1.6	4.8	5.5	96	ne.	ne.	haze.	cloudy.	drizzle.	
5	.791	.850	.750	.823	76.8	81.5	80.4	76.1	1.0	4.2	4.6	97	ne.	ne.	rain.	hard rain.	high wind.	
6	.785	.820	.733	.805	76.1	80.4	80.4	75.9	0.7	3.7	3.1	99	N.E.	N.E.	do	do	cloudy.	
7	.765	.828	.747	.782	75.4	80.4	82.1	77.2	0.6	3.2	4.4	98	N. E.	N. E.	dull.	rn. dull.	hazy.	
8	.772	.812	.718	.758	75.1	81.4	84.0	78.4	0.1	4.4	6.5	95	o.	o.	clear.	fine.	clear.	
9	.688	.768	.668	.754	78.2	83.4	84.7	81.5	1.1	5.5	5.3	95	o.	o.	do	fine. clds.	stratus.	
10	.769	.780	.697	.780	78.3	84.0	86.7	83.2	1.7	5.2	6.3	92	o.	o.	hazy.	fine.	clear.	
11	.765	.803	.693	.763	82.2	85.2	86.3	86.1	2.2	5.0	6.1	93	o.	o.	clear.	do	bright.	
12	.669	.780	.678	.733	83.1	85.4	86.8	83.0	2.0	3.7	7.3	94	o.	o.	do	clear.	cum. cirri.	
13	.721	.768	.665	.733	83.0	85.7	87.4	82.1	2.3	4.6	8.6	87	o.	o.	do	cum-strat.	cumuli.	
14	.785	.855	.788	.842	80.4	86.1	84.4	77.4	2.9	6.1	5.4	94	ne.	ne.	do	cont. rn.	rain.	
15	.781	.835	.750	.785	73.0	81.5	82.6	78.3	1.1	3.3	3.6	99	se.	se.	dull	much. rn.	hazy.	
16	.711	.820	.702	.768	77.5	81.4	82.6	79.3	0.8	3.1	2.5	98	ne.	ne.	storm.	showery.	do	
17	.716	.800	.706	.778	77.4	81.7	82.2	77.4	0.0	2.4	2.9	99	o.	o.	hardrain.	hazy.	scud.	
18	.762	.826	.730	.798	77.2	81.1	86.7	82.5	0.0	2.7	3.6	99	E.	ne.	hazy.	do	hazy.	
19	.780	.830	.740	.800	79.1	82.5	86.6	82.8	1.2	2.3	2.4	99	E.	ne.	cumuli.	do	clear.	
20	.759	.764	.650	.751	79.0	82.6	101.0	80.2	1.0	3.6	5.3	94	o.	o.	clear.	fine.	hardshower.	
21	.790	.704	.698	.734	79.1	81.9	104.0	84.8	1.4	3.2	4.9	95	o.	o.	cumuli.	clear.	cum. cirrus.	
22	.673	.788	.672	.746	80.0	83.2	101.	82.2	1.6	3.2	5.2	96	o.	o.	do	cum-strat.	storm.	
23	.721	.789	.686	.754	79.5	83.1	105.	86.2	1.0	3.2	5.6	96	o.	o.	clear.	do	hd. squall.	
24	.732	.803	.744	.781	79.5	83.1	90.0	83.3	1.5	3.6	6.0	95	nw.	nw.	cumuli.	showers.	haze.	
25	.768	.808	.714	.727	76.8	81.2	81.9	77.2	1.7	3.3	5.0	93	ne.	ne.	nimbi.	rn. clear.	cl rain.	
26	.815	.872	.822	.886	77.2	82.4	82.4	78.3	1.7	4.0	4.0	96	o.	o.	clear.	fine.	clear.	
27	.858	.950	.880	.910	78.2	82.4	80.7	76.5	2.1	4.6	4.4	96	o.	o.	do	rain.	do	
28	.797	.964	.878	.905	75.1	79.7	81.5	76.5	1.2	3.3	3.6	98	ne.	ne.	do	cloudy.	do	
29	.884	.950	.820	.868	76.6	81.2	82.9	77.5	1.0	3.8	5.8	95	n.	S.	do	cumuli.	do	
30	.802	.986	.800	.836	76.2	81.2	86.7	80.0	0.5	4.4	5.2	96	ne.	se.	do	hvy. squall.	storm.	
31	.803	.970	.783	.844	79.2	81.0	82.1	73.7	0.5	4.0	3.8	98	N.	SE.	hazy.	cloudy.	rn. clear.	
Mean,	29,766	836	732	800	73.9	82.0	83.9	79.6	1.3	4.0	5.0	95.5		calms.		unusually wet.		

The instruments are the same, and placed in the same situations as usual.

# JOURNAL

OF

## THE ASIATIC SOCIETY.

No. 35.—November, 1834.

I.—*Extracts from the MOHYT, that is the Ocean, a Turkish work on Navigation in the Indian Seas. Translated by the BARON JOSEPH VON HAMMER, Prof. Orient. Lang. Vienna, Hon. Mem. As. Soc. &c.*

[Presented in Manuscript, and read at the Meeting of the 5th instant.]

SI'DI' AL CHELEBI, captain of the fleet of Sultán Suleimán, the legislator in the Red Sea, is already known in Europe and India, by the notice given of his journey overland from the Indian shores to Constantinople\*, and by the titles of his works recorded in the history of the Ottoman empire†. The two principal ones are, first, the description of his above-mentioned journey, which bears the title, *Mirror of Countries*‡; the second, his work on navigation in general, and particularly in the Indian seas, which forms the subject of this notice.

My attention to the high interest of this nautical work having been first roused thirty years ago, by the article mentioning it in HÁJI' CALFA'S Bibliographic Dictionary, I spared no kind of exertion to find a copy of it, whether in the libraries, or among the book-sellers of Constantinople: but all my researches were baffled for more than twenty years, until at length I lighted upon it in the library of the *Musèo Borbonico* at Naples, in the year 1825; and after an investigation of seven years more, I was at last fortunate enough to buy at Constantinople, the manuscript serving for this notice. It is written in the fair *Nesghi* hand, bearing the stamp of Sultán Suleimán's age, and is stated to have been copied but four years after the composition of the original, which was finished at *Ahmedabad*, the capital of Gujerát, in the last

\* In the Transactions of the Bombay Literary Society; in the *Asiatic Journal*; and the *Journal Asiatique*; and printed separately.

† Tom. iv. p. 416.

‡ *Miret-ul-memalik*.



days of Moharrem of the year 962, (December, 1554,) while the present copy was finished in the town of *Amed* or *Diarbeker*, in the first days of *Rabi ul awal* of the year 966, (December, 1558.) The manuscript consists of 134 leaves or 238 pages, large octavo.

SÍDÍ ALÍ CAPUDÁN'S (Captain) work, according to the announcement in its preface, has been compiled out of no less than ten Arabic works on the Geography and Navigation of India, three ancient, and seven modern ones.

The ancient ones : 1. The work of LEIS BEN KAHLA'N ; 2, of MAHAMMAD BEN SHADÁN ; 3, of SAHL BEN ABA'N. The modern : 4, the work of JOLFÁR BEN AHMED BEN MA'JED, a native of *Ommán* ; then the five works of SULKIMA'N BEN AHMED, a native of the town of *Sheher\**, viz. 5, the *Fewald†* ; 6, the *Hawíe‡* ; 7, the *Tohfetelfohúl§* ; 8, the *Omdet||* ; 9, the *Minháj¶* ; 10, the *Kiládet ul-shomús\*\**.

The interest of its contents may be fairly estimated from the titles of its chapters and sections.

FIRST CHAPTER.—*Of the names of the skies and the stars. of the elements and what belongs to them* : 1, of the skies, stars, and elements ; 2, of the division of the circles of the skies ; 3, of the astronomical measures called *Essubett††*, (inches,) and of the cardinal points of the compass, (*Ahnán*)‡‡ ; 4, of the instruments serving to measure the distance of the stars ; 5, of the making of these instruments ; 6, of the calculation necessary to take the height of the stars.

SECOND CHAPTER.—*Of the Oss§§ (the foundation) of all astronomical calculations* : 1, of the solar and lunar years ; 2, of the foundation of the calculation of solar and lunar years ; 3, of the foundation of the Roman and Coptic solar year ; 4, of the mode of finding the lunar year ; 5, of the mode of finding the Roman year ; 6, of the mode of finding the Coptic year ; 7, of the mode of finding the Persian year.

THIRD CHAPTER.—*Of the divisions and subdivisions of the compass, rhumbs (Erwám |||) and points (Tarfút ¶¶)* ; 1, of the rhumbs lying between the cardinal points (*Ahnán*), 2, of the subdivisions of the rhumbs called *Turfat* ; 3, of the true circles of the compass.

FOURTH CHAPTER.—*Of the Indian Islands above and below the wind, and of America* : 1, of the islands situated above the wind, 2, of the absolute circles ; 3, of the circles situated below the wind ; 4, of the circles of the islands ; 5, of America.

\* شحر in the country of بزر (near Aden). † فواید useful applications.

‡ حاوید the comprehending.

§ عمدة the column.

\*\* قلادة الشمس the collar of suns.

¶ تحفة الفحول present for classic men.

¶ منهاج the true road.

†† اصابع

‡‡ احسان

اس

اروام

ترفات

**FIFTH CHAPTER.**—*Of the calculations and the technical terms of mariners :* 1, of measurement in general, 2, of the fundamental measure ; 3, of the measurement of stars which rise and set together ; 4, of the names of the stars, from which are taken the names of the rhumbs and points of the compass ; 5, of the circuit of the two highest stars in Ursa Minor (*Farkadain*) round the pole ; 6, of the lunar stations ; 7, requisites of the pilot ; 8, measures of the most celebrated stars.

**SIXTH CHAPTER.**—*Of the measures of the most celebrated continents :* 1, of the difference of polar measures ; 2, of the measurement by the north pole ; 3, of the measurement by the two highest stars in Ursa Minor ( $\beta, \gamma$ ) ; 4, of the measurement by the four stars of Ursa Major ( $\alpha, \beta, \gamma, \delta$ .)

**SEVENTH CHAPTER.**—*Of distances :* 1, of the original distances ; 2, of the different manners of calculation ; 3, of the difference of distance for two ships sailing on two different points of the compass ; 4, of the composition of charts and maps ; 5, of the distances of certain places situated in the direction up to within one *Esba* (astronomical inch) from the pole ; 6, of the distances of some places between them.

**EIGHTH CHAPTER.**—*Of the winds and monsoons :* 1, of the winds ; 2, of the monsoons and their time ; 3, of the monsoon called *headwind* and monsoon of the olives, (*Mausim zaitúni\**) ; 4, of the monsoon called by some *Damaní†* and its time ; 5, of the monsoon called the Eastern *Sabá‡*, *Ezib§*, and *Rihi qabúl||*.

**NINTH CHAPTER.**—*Notice of certain islands and voyages, and the signs of vicinity of land necessary to be known by pilots :* 1, of the islands of the Arabian continent ; 2, of the islands of the Persian continent ; 3, of the voyages along shore, and the signs of vicinity of land.

**TENTH CHAPTER.**—*Of accidents and dangers to be warded off by reason and experience, and of hurricanes (Tufán) :* 1, of accidents and dangers to be warded off by reason and experience ; 2, of the hurricanes.

The most interesting of these ten chapters are the *fourth*, on the continents and islands, above and below the wind ; the *eighth*, on the monsoons ; and the *ninth*, on the Indian voyages, wherein the direction and steering of thirty voyages, with all the intermediate points, which are to be touched on, or taken care of, are given in detail. As a specimen of the practical interest of this curious and useful book follows the translation of the eighth chapter, on the *monsoons*, as being one of the shortest, and not least interesting.

#### CHAPTER VIII.—OF THE WINDS AND MONSOONS.

##### Section 1. *Of the Winds.*

The cause of the wind is the motion of the air ; don't you see that agitating a fan you do produce wind ? It is also produced by cold, as may be

ريح قبول || ازيب § صبا † موسم زيتوني \*

shown from numerous proofs. If you sail under a cloudy sky, with a strong wind, and a cloud approaches the ship from one side, so that the cold of the cloud is sensible, the first wind ceases, and with its ceasing, the cold ceases also; further, winds blowing from the land set in at night, and those blowing during the day come from the sea, and cease when night approaches; the cause of which is, that at night the earth grows cool, and the sea remains warm, the contrary of which is the case during day-time, because, by the reverberation of the rays of the sun, mountains and deserts are heated during the day. Another proof is, that the coldness of sandy deserts is stronger than that of a mountainous country, and ground watered by rain is colder than ground which is not drenched by rain. Another proof is, that a cloud, particularly when in motion, produces wind, arising from the cold which is hoarded up in the cloud. The principal winds are four, according to the Arabs, the Northern, Southern, Eastern, and Western; those between them are called *sidewinds* (Nokeba); but the pilots call them by names taken from the rising and setting of certain stars, and assign them certain limits, within which they begin or attain their greatest strength, and cease. These winds, limited by space and time, are called *Mausim* (*Monsoon*); viz. *seasons*.

The following Arabic verses give the names of the four cardinal winds:

*Saba* (the East) blows from the rising of the sun. From the *Polar Star* comes the North wind, called *Shemeul*; and from *Canopus*, the South wind, called *Janúb*; opposite to the East blows the West wind, *Dobúr*.

*Section 2. Of the different sorts of monsoons, and the time they blow in.*

Be it known, that the ancient masters of navigation have fixed the time of the *monsoon*, that is to say, the time of voyages at sea, according to the year of *Yazdajird*, and that the pilots of recent time follow their steps; but as there is in every true solar, that is to say *Jalálian*, year, near the fourth of a degree more, every four years, a day is intercalated, so that this day is deficient in the *Yazdajirdian* year. The late master SULFIMA'N BEN AHMAD wrote his book *Omdat* (the column) in the year of the Hijra 917 (1511), and fixed then the time of the monsoons according to that year, since which, up to that of this translation, 961 (1753), more than forty years have elapsed, so that the time fixed by him for the monsoon, falls now short by ten days. For example, the monsoon which set then in on the 120th day of the *Yazdajirdian* year, sets in now on the 130th, and that which was fixed then on the 160th, falls now on the 170th. The rest must be calculated in the same way, in order to avoid error and confusion; but even the intercalation of a day every fourth or fifth year is not free of error; it is, therefore, the most expedient to calculate according to the zodiacal year\*, that is to say, the *Jalálian* year, which requires no intercalary days. The monsoon of each country is limited by its fixed time. Remark further, that wherever the word *fi* (about) is added, it is to be understood, that the monsoon sets in about the time stated; for example, if it is said *about* the tenth of the year, means that it does not exactly set in on

\* *سنة بروج* the year of the constellations.

*Naurôz* (the new-year's day), but within the first ten days of the year ; but if *about* is not added, it means exactly the day mentioned ; for example, it sets in on the tenth day of the year, means that it sets regularly in on the tenth. At the time when the ancient Arabic pilots wrote their works, the radical Jalálian year was not yet established, neither were the Roman months known in these countries, and they calculated, therefore, according to the *Yazdajirdian* year ; but the calculation of the *Jalálian* year is much easier. Be it known, that at the time when the above-said book (the Column of SULEIMA'N BEN AHMAD) was translated, the *Naurôze Sultáni*, that is to say, the Jalálian new-year's day, fell on the 135th day of the Yazdajirdian year, that is to say, on the 15th of Mordád\*.

The monsoons are of two sorts, the western ones, called by the seamen *Ríhi Kews*†, the second, the eastern ones called *Ríhi Azíb*‡, and *Sabá*§. The eastern monsoons sub-divide again in two classes ; 'during the first, the Indian seas are shut ; nevertheless, they are called *Mausim*|| (season).

Section 3. The first sub-division of the first sort called *Ráser-rík*\* ; (headwind), or the monsoon of the olives, (*Mausimí zaitúni*.)

The monsoon of *Aden*, *Gujerat*, and *Concona*, from the 130th day of the Yazdajirdian year, which is the 360th of the Jalálian, that is, five days before the next new-year's day (16th March). The point from which it arises is *Aden* ; sometimes it ceases within the 170th of the Yazdajirdian year, which is the 35th Jal. (24th April). From *Aden* ships set out within the 150th or 160th day of the Yazdajirdian year, which answer to the 15th or 25th Jal. (4-14th April), they arrive on the 180th of the Yazdajirdian, or 45th of the Jalálian year (4th May), at *Sheher* ; proceed from thence to *Gujurat* and *Concona*, but not onwards to *Munibar*†† (Malabar), where there is much rain and danger.

2. The monsoon of *Sheher*, *Gujerat*, *Malabar* and *Concan*. The highest monsoon of *Gujerat* sets in within the 150th of the Yazdajirdian, or 18th of the Jalálian year (7th April). The highest monsoon of *Concan* sets in within the 140th Yazdajirdian or 5th Jalálian (25th March). The monsoon of *Malabar* within the 130th Yazdajirdian or 360th Jalálian (16th March), five days before the beginning of next year††.

3. The monsoon of *Dhofár*, *Gujerat*, and *Malabar*, sets in within the 100th Yazdajirdian = 330th Jalálian (14th February) : when the navigation is open to all India, for *Dhofár* is the place from whence the *Ríhi Kews* (the western monsoon) sets forth, which blows within the 70th day of the Yazd. year, equal to the 300th of the Jalálian (15th Jan.)

\* The Yazdajirdian *Naurôz* falling in the year 1553, on the 28th October, the *Jalálian*, on the 135th day, answered to the 12th of March, 1554 ; this is, however, not the true equinox, which in the year 1554 fell on the 11th, on which day the longitude of the sun was = 0.

منیبار†† راس الريح \*\* موسم || صبا § ریح اذیب ‡ ریح کوس †

†† Here the calculation does not answer, as the number of the one or the other must be changed if the difference of 135 should be made out : this is also the case with the two following ones.

4. The monsoon of the shore of *Gujerat* occurs within the 160th day of the Yazdajirdian, equal to 25th of the Jalálian (14th April).

5. The monsoon of the coast of *Meshkassa\**, *Hairíja†*, *Sheher*, and *Aden* sets, in within (about) the 170th day of the Yazdajirdian year, equal to 35th of the Jalálian (24th April).

The monsoons below the wind, that is of the parts of India situated below the wind, are the following :

6. The monsoon of *Gujerat*, to sail for *Malacca*, *Shomatora*, *Tanassari*, *Bengal*, and all the tracts situated below the wind, sets in about the 130th day of the Yazdajirdian year, equal to 360th of the Jalálian‡, and lasts till the 170th Yazdajirdian, equal to 25th Jalálian (24th April); the highest monsoon sets in about the 150th day of the Yazdajirdian year, answering to the 15th of the Jalálian.

7. The monsoon of *Concona* to sail for *Malacca*, *Shomatora§*, *Tanassari*, *Martaban* and *Fáikú||*, and all the tracts situated below the wind, sets in within the 140th day of the Yazdajirdian year, or on the fifth day before the Jalálian new-year's day (16th March), and lasts till to the 180th day of the Yazdajirdian year, equal to the 45th of the Jalálian year (4th May); the highest monsoon sets in about the 160th or 150th day of the Yazdajirdian year, answering to the 25th or 15th of the Jalálian (4th—14th April).

8. The monsoon of *Malabar*, to sail for *Malacca*, *Shomatora*, *Tanassari*, *Martaban*, and *Bengal*, and all the ports situated below the wind, sets in about the 160th day of the Yazdajirdian year, answering to the 25th of the Jalálian (14th April).

9. The monsoon of *Díbi¶*, for *Malacca*, *Shomatora*, *Tanassari*, *Martaban*, and *Bengal*, and all the ports situated below the wind, sets in within the 160th day of the Yazdajirdian year, equal to 25th of the Jalálian (14th April).

10. The monsoon of *Sheher*, for sailing to *Malacca*, *Shomatora*, *Tanassari*, *Martaban*, and *Bengal*, and all the ports situated below the wind, sets in within the 110th day of the Yazdajirdian year\*\*, which answers to the 340th of the Jalálian; but from *Sheher* to *Furtak*, you meet the western wind *Kaws*, which sets in about the 130th Yazd. or 360th Jalálian, five days before the new-year's day, and six days if there be an intercalary one (16th March).

11. The monsoon of *Furtak* for the above said ports sets in on the same day.

12. The monsoon of *Dhofár* for *Malacca*, *Shomatora*, *Tanassari*, *Martaban*, and *Bengal*, and all the ports situated below the wind, sets in about the 10th day of the Yazdajirdian, equal to 340th Jalálian (24th Feb.)

13. The monsoon of *Muscat*, for *Malacca*, *Shomatora*, to the continent of *Siam*, *Bengal*, and all the ports below the wind, sets in about the 130th day of the Yazdajirdian year, equal to 360th of the Jalálian (16th March).

14. The monsoon of *Zelua* and *Berberi*, for *Sheher* and *Meshkara††*, the highest (strongest) sets in about the 120th Yazd. equal to 85th Jal. (13 June).

15. The monsoon of *Aden*, for *Sheher* and *Meshkara*, at the same time.

\* Muscat? † الحرايق ‡ Here is the same error of calculation above observed.

§ Sumatra. || Pegu. ¶ The Maldives. \*\* There is also a want of agreement in this date. †† Larhkbara?

16. The monsoon of *Aden*, for *Hormúz*, sets in about the 190th day Yazdajirdian, equal to 55th, or the 200th equal to 65th Jalálian, (14th or 21th May) : later, it is not good.

*Section 4. The second sub-division of the first sort of monsoon, which is the end of Kaws, called by some Tirmah, and by some Dumáni.*

17. The monsoon of *Mecca*, or rather of its port *Jedda*, to *Malabar*, *Concona*, *Gujerat*, and *Hormúz*, sets in about the 280th day of the Yazdajirdian year, answering to the 145th of the Jalálian (12th August).

18. The monsoon of *Sewakín\**, to *Malabar*, *Concona*, *Gujerat*, sets in about the 280th day of the Yazdajirdian year, equal to 145th of the Jalálian.

19. The monsoon of *Silá* and *Berberi* to *Malabar*, *Concon*, *Gujerat*, *Hormúz*, sets in about the 290th day of the Yazdajirdian year, equal to 150th of the Jalálian (17th August).

20. The monsoon of *Aden* to *Malubar*, *Concona*, *Gujerat*, sets in about the same time, or five days later ; that is to say, on the 155th or 160th day of the Jalálian year (22nd—27th August).

21. The monsoon of *Sheher* to *Malabar*, *Concona*, *Gujerat*, sets in on the 300th day of the Yazdajirdian year, answering to the 165th of the Jalálian year (2nd September).

22. The monsoon of *Meshkara* for sailing to *Malabar*, *Concona*, *Gujerat*, springs up on the 300th day of the Yazdajirdian year, which answers to the 165th of the Jalálian, according to the rule above-mentioned.

23. The monsoon of *Dhofár* for *Malubar*, *Concona*, *Gujerat*, *Hormúz*, sets in on the 300th day of the Yazdajirdian year, answering to the 165th of the Jalálian (2nd September).

24. The monsoon of *Fartak* and *Aden*, for sailing to *Hormúz*, sets in about the 290th day of the Yazdajirdian year, answering to the 155th of the Jalálian (22nd August).

25. The monsoon of *Kaulahát* and *Muscat* to *Gujerat* and *Concona*, sets in on the 300th day of the Yazdajirdian year, which is the 165th of the Jalálian ; from this time up to the 180th or 190th Yazd. or 45th,—55th, day of the Jal. year (4th—14th May), the navigation is open to all India. The monsoons below the wind, which blow at this time from the Arabian continent and the coasts, and the other countries below the wind, are :

26. The monsoon for sailing from *Aden* to *Malacca*, *Shomotora*, *Tunassari*, *Martaban*, *Bengal*, and all the ports situated below the wind, sets in about the 280th day of the Yazdajirdian, that is, the 145th of the Jalálian year (12th August).

27. The monsoon of *Sheher* and *Meshkara*, to the above said ports, sets in about the 290th day of the Yazdajirdian year, which is the 155th of the Jalálian (22nd August).

28. The monsoon of *Gujerat*, for sailing to *Shomotora*, *Tunassari*, *Bengal*, and all the ports situated below the wind, sets in on the 300th day of the Yazdajirdian, equal to 166th of the Jalálian year (2nd September).

29. The monsoon of *Concona*, to sail from it to the above ports, is setting in on the 305th day of the Yazdajirdian year, which is the 170th of the Jalálian (6th September).

\* Opposite to *Jedda*.

30. The monsoon for sailing from *Malabar* to *Malacca*, *Shomotora*, *Tanassari*, and all the ports below the wind, sets in about the 320th day of the Yazdajirdian year, equal to 185th of the Jalálian year (21st Sept.)

31. The monsoon for sailing from *Díbi* to *Malacca*, *Shomotora*, *Tanassari*, *Martaban*, *Bengal*, sets in about the 320th day of the Yazdajirdian year, answering to the 185th of the Jalálian (21st Sept.)

32. The monsoon of the continent of *Alinat* (? *Barronat*) for sailing from it to *Siam*, is setting in on the 325th day of the Yazdajirdian, that is on the 190th of the Jalálian year (26th Sept.)

33. The monsoon of the coasts for sailing to *Hormúz*, sets in about the 300th day of the Yazdajirdian, that is to say, the 185th of the Jalálian year (21st Sept.?)

34. The monsoon from the coasts and *Maukadash* (in Africa) to *Jazreddib* (the Maldives) sets in about the 320th day of the Yazdajirdian, that is to say, the 185th of the Jalálian year (21st Sept.)

35. The monsoon for sailing from the coasts to the Arabian continent, to *Dhofár*, *Meshkaun*, *Hairija*, *Sheher*, *Aden*, sets in on the 325th day of the Yazdajirdian year, that is, on the 190th Jal. (26th Sept.)

*Section 5. The second class of monsoons, that is the eastern ones called Azib or Sabá\*.*

36. The monsoon for sailing from *Gujerat* to all the Arabian islands, springs up about the 340th day of the Yazdajirdian year, answering to the 205th Jal. (11th Oct.) and lasts till to the 340th or 350th, that is, till to the 5th or 15th day of the Jalálian year (5th March); but to *Kaulhat*, *Muscat*, and *Hormúz*, it may be used till the 60th day of the Yazdajirdian year, or the 25th of the Jalálian (14th April); later it is not good.

The finest monsoon for sailing from India to the Arabian continent sets in about the 100th and 110th day of the Yazdajirdian year, which is the 330th or 340th of the Jalálian (13th—23rd February).

37. The monsoon from *Concona* to the Arabian continent sets in about the 350th day of the Yazdajirdian year, and lasts till the 140th of the next; that is to say, from the 205th till to the 5th of the next Jalálian year, (11th Oct.—25th March :) later it is not good; that for *Hormúz* lasts till to the 150th of the Yazdajirdian, that is to say, the 15th of the Jalálian year.

38. The monsoon from *Hormúz* to the Arabian continent sets in about the 340th day of the Yazdajirdian year, lasting to the 100th of the next; that is to say, from the 205th to the 330th of the Jalálian year (11th Oct.—13th Feb.). This is for the coasting voyage; but if the high sea is kept, it serves from about the 100th day of the Yazdajirdian year, to the 30th of the next; that is to say, from the 330th to the 365th Jal. (13th Feb.—2nd March).

39. The monsoon from *Gujerat* to the coasts, blows from about the 340th day of the Yazdajirdian year to the 90th of the next year; that is, from the 205th to the 320th of the Jalálian (11th Oct.—3rd Feb.)

40. The monsoon from *Bengal* to *Aden* and *Mecca*, that is to say, to the ports of *Jedda* and *Hormúz*, sets in about the 50th day of the Yazda-

jirdian year, and lasts till to the 80th; that is, from the 280th to the 310th of the Jalálian year (25th Dec.—25th Jan.); but for sailing to the continent of *Alinat* (? *Burronat*) and the island of Ceylon, it sets in about the 100th day of the Yazdajirdian, equal to 330th Jalálian (13th Feb.)

41. The monsoon for sailing from *Malucca* to *Jedda*, *Aden*, *Hormúz*, blows from about the 50th day of the Yazd. year, to about the 100th; that is to say, from about the 280th day till to the 330th Jal. (25th Dec.—13th Feb.)

42. The monsoon from *Tanassari* and *Martaban*, to *Jeddu*, *Aden*, and *Hormúz*, blows like that for Bengal and Malacca.

43. The monsoon from *Shomatora* to *Jedda*, *Aden*, *Hormúz*, blows from about the 30th day of the Yazdajirdian year, till to the 90th; that is to say, from the 260th to the 320th of the Jalálian year (5th Dec.—3rd Feb.)

44. The monsoon for sailing from *Shomatora* to *Bengal*, blows from about 100th to 150th day of the Yazdajirdian year; that is to say, from the 330th till to the 15th of the next Jalálian year (13th Feb.—4th April).

45. The monsoon of *Tanassari* is the same with that of Bengal.

46. The monsoon of *Jazreddib* to *Aden* and the whole Arabian continent, blows from the 10th to about the 120th day of the Yazd. year; that is, from the 240th till about the 350th day of the Jalálian year (5th Nov.—5th Mar.)

47. The monsoon of *Diúl Sind*, for sailing from thence to the Arabian continent, blows from the 10th of the Yazdajirdian year to about the 120th; that is, from the 240th to about the 350th of the Jalálian (ditto).

48. The monsoon of *Mélandi* to *Jazrul Kumr*, (island of the moon\*,) blows from about the 80th to the 100th of the Yazdajirdian year; that is, from the 310th to the 330th of the Jalálian (24th Jan.—13th Feb.)

49. The monsoon of *Kíuí* for sailing to *Sofala*†, blows from the 10th to the 60th of the Yazdajirdian, that is, from the 240th to the 290th of the Jalálian year (15th Nov.—4th Jan.)

50. The monsoon from *Sofala* to *Kíuí*, blows from about the 160th to the 190th of the Yazdajirdian year; that is to say, from the 25th to the 55th Jal. (14th April—14th May.) The finest lasts till about the 170th Yazd. 35th Jal. (24th April.)

The dates of these monsoons are given according to the dates of the year in which this book was written in, and are ten days later than those given by the master *Sáleimán Ben Ahmad*, the author of the *Omdat* (column). If the calculation is made in the Yazdajirdian years, it is necessary to take into account the intercalary years; but in the calculation of Jalálian years, the same order may be always followed up.

The truth of these statements, and the error of the calculation (as it is impossible to guess anywhere else, but on the spot, which of the two numbers may be the right or false one), are only to be elucidated in India itself, and are referred therefore by the translator to the learned members of the Asiatic Societies of Calcutta, Bombay, and Madras.

[We have added to the above the English dates for the present year, making the Jaláli year begin on the 21st March, with the vernal equinox.—Ed.]

\* Madagascar.

† On the coast of Africa.



**II.—Account of some Inscriptions in the Abyssinian character, found at Hassan Ghoráb, near Aden, on the Arabian coast. By Lieutenant WELLSTED, Indian Navy, attached to the Survey department.**

[In an Extract from Lieutenant WELLSTED's Journal, communicated by the Right Honorable the Governor in Council at Bombay to the Asiatic Society, and read at the Meeting of the 5th November.]

“ On the morning of the 6th of May, 1834, we anchored in the Honorable Company's Surveying Ship *Palinurus* on the Arabian coast, in a short and narrow channel, formed on the one hand by a low rocky islet, and on the other, by a lofty black-looking bluff, to which our pilot applied the designation of Hassan Ghoráb. Some ruins having been perceived on the summit of the latter, a party shortly after our arrival proceeded to the shore for the purpose of examining them. To avoid the swell which rolled along the opposite side of the island, and produced a considerable surf against the seaward face of the cliff, as it rose up perpendicularly from the sea, we pulled into a small bay on the N. E. side, where the water was much smoother. Landing on a sandy belt, which extended from the margin of the sea to the base of the hill, we found ourselves amidst the ruins of numerous houses, walls, and towers. The houses are small, of a square form ; and have mostly four rooms, on a single floor ; the walls appear to have been carried along the face of the hill in parallel lines, at different heights ;—several towers also occur at scattered distances. The hill on this side, for one-third of its height, ascends with a moderate acclivity, and along the slope, the ruins are thickly scattered ; there are, however, no remains of public buildings or edifices, nor are there any traces of arches or columns. The whole have been constructed from fragments detached from the rock, and from the several patches which remain, it is very certain that the greater number must have been covered over with cement ; both this and the mortar, from the action of the weather, have almost entirely disappeared. The cement appears from the traces yet left on the beach, to have been obtained, as it is at present in many parts of the Arabian coast, by the calcination of coral. A further examination during an extension of our walk round the side of the hill, enabled us to discover that Hassan Ghoráb was about 500 feet in height, that it was composed of a dark greyish-coloured compact limestone, and that it had been formerly insulated, though it was now connected to the main by a low sandy isthmus, which had been blown up there by the violence of the S. W. winds, and was evidently of recent formation. The action of the sea might indeed be traced in the cavities and hollows exhibited by a ridge of rocks now at some distance from the water, but which it was evident at no very distant

period must have been covered by it. During this time we had been looking in vain for some path by which we might ascend to the summit; but it appeared inaccessible on every side, and we had almost given up our search, when one of the party suggested, that two towers, which were standing by themselves, might possibly have commanded the approach and entrance to one; scrambling accordingly over the ruins formed by the falling of the upper part of these, we at length discovered some faint traces of a track, which in order to facilitate the ascent had been cut along the face of the hill in a zig-zag direction. But beyond and above that the steep front of the cliff had been cut down so as to form a sort of terrace, and even here the path at the widest part would not admit more than two abreast; there being a steep precipice above and below us, we did not find it a very pleasant road; on a rock to the right, about one-third the ascent from the top, we discovered the inscriptions, which I have subjoined. The characters were two and a half inches in length, and it will be seen, are executed with much care, order, and regularity. In order to avoid the possibility of omission or error, three separate copies were taken by different individuals, which have all been subsequently examined and compared. Continuing our route from hence to the top of the hill, houses nearly as numerous as below, walls, and other defensive edifices, were perceived at various distances, scattered over its surface, and on the verge of the precipice a square tower of massive masonry had been erected; it has probably served both as a watch-tower and light-house. Some of the stones are of very large dimensions, the windows and doors are plain, and no arches are to be seen; about one hundred yards from the tower the tanks are situated, they have been excavated with much labor out of the solid rock and are cemented inside.

Having now surveyed every part of the hill, we could not but come to the conclusion that it had been formed both by nature and art as a place of extraordinary strength: while the former had left it inaccessible at but one point, the latter had so completely fortified it at that quarter, that it would be impossible for courage or address, however consummate, to scale it. But what, independent of this advantage, must have given it to foreigners its principal value, would have been its insular position, which, when we consider the lawless and barbarous character that the inhabitants of this coast have borne from the earliest period, must to them, both as a retreat essential to their public safety, and also as a magazine, have rendered it invaluable.

The circumstances of its possessing two harbours affording anchorage in either monsoon, on a coast remarkably destitute of any (as yet discovered) so well sheltered, would appear to indicate a commercial

character to the town. But it is to the inscription we must look for the elucidation of this point, as well as to the several others connected with it.

The origin and purport of the inscriptions which have been found by various travellers inscribed on the faces of several mountains and hills in Arabia, have engaged the attention and excited the inquiries of the learned during the greater part of the last, and the early part of the present, century, and many copies have been transmitted to Europe for their investigation. Many of these I have in my possession, or have referred to; but this differs in the nature of its characters from them all.

I forbear, therefore, until this shall be deciphered, from making any other suggestions or remarks, than those which I have submitted relating to the local features of the spot on which they were found. I cannot however neglect to draw attention to the obvious and striking coincidence between the distance of the ports of Hassan Ghoráb, as deduced from our survey, and that specified by Arrian, as the distance of the port of cave Canum or Kane, from the port called Arabia Felix, which modern geographers with much confidence place at the present harbour of Aden.

The natives possessed no information respecting the ruins, excepting that they had always heard their erection ascribed to the "foreigners."

The dimensions of the Tanks alluded to as cut out of the rock, were as follows :

	<i>Length.</i>	<i>Breadth.</i>	<i>Depth.</i>
No. 1, Square,	32 ft. 8 in.	29 ft. 5 in.	14 ft. 0 in.
No. 2, Long-oval,	42 do. 7 do.	17 do. 2 do.	12 do. 11 do.
No. 3, Semi-elliptical,	70 do. 5 do.	12 do. 0 do.	variable.
No. 4, Oblong,	30 do. 6 do.	9 do. 6 do.	9 do. 1 do.

[We have omitted in the plate the specimens of ancient and modern Ethiopic from the inscriptions at Axum, because they may be found in BRUCE, Lord VALENTIA, or in any catalogue of ancient alphabets. Lieut. WELLSTED remarks that the inscription found at Hassan Ghoráb, on close examination, resembles both ancient and modern Ethiopic. The Ethiopians ruled Yemen, a part of Arabia, previous to the appearance of Muhammed.—ED.]

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III.—*Further Information on the Topes of Mánikyála, being the translation of an Extract from a Manuscript Memoir on Ancient Taxila, by Mons. A. COURT, Engineer Officer in the Army of Mahárájd RANJIT SINGH.*

[We have to thank Captain WADE for procuring us the favor of the following extract for insertion in the Journal. It continues our history of the opening of these monuments from the period to which it was brought up by Dr. GERARD'S notice of Dr. MARTIN'S operations, at page 332. We regret that M. COURT had

not seen what had already appeared on the subject, as it would necessarily have altered his views of the antiquity of the monument, if not of its origin. We hope to obtain a copy of the inscriptions, which will probably be in the same dialect of the Pehlevi as occurs on the cylinders.—ED.]

*Manikyála* is the name of a small village situated on the route leading from Attok to Láhor. It is built on the ruins of a very ancient town of unknown origin. The geographical position of these ruins, and particularly the abundance of coins found among them, afford the presumption that this city must have been the capital of all the country between the Indus and the Hydaspes, a country which the ancients knew by the name of *Taxila*, and of which frequent mention is made in the history of ALEXANDER.

There is at *Manikyála* a vast and massive cupola of great antiquity. It is visible at a considerable distance, having a height of about 80 feet, with 310 or 320 of circumference. It is solidly built of quarried stones with lime cement. The outer layer is of sandstone. In the interior, the masonry is of freestone (*pierre de taille*), mixed with sandstone (*grès*) and granite; but principally, with a shelly limestone (*pierre de concretion*), which by its porosity resembles stalactite. Age and exposure have so worn away the northern face of the edifice, that it is now easy to ascend to the summit, which could not have been done formerly, because there were no regular steps constructed on the exterior. Its architecture is simple, and offers nothing worthy of much remark. Round the circumference, near the base, is seen, in bas-relief, a range of small columns, the capitals of which appear to have been ornamented with ram's heads (*têtes de beliers*). These ornaments are now scarcely perceptible on account of the wearing away of the sandstone by time. I have remarked similar ornaments at a tank situated between *Bimber* and *Serai-saidábád*, on the road to Cashmír, and I remember observing the same kind of thing on the columns of the towns at Persepolis.

This monument is in my opinion nothing more than a tomb of some ancient king of the country, or it may be the work of some conqueror from Persia or Bactria, who may have raised it in memory of some battle fought on the spot, intended to cover the remains of the warriors who fell in the combat. This last conjecture appears the more probable, seeing that similar cupolas are equally remarked in the district of *Rável Pindi*, in the country of the *Hazáris*, which joins the former, at *Péshávar*, in the *Khaiber* hills, at *Jelálábád*, at *Laqmán*, at *Kábul*, and even, they say, at *Bámian*:—all of them places situated on the road leading from Persia, or Bactriana, into Hindustán. I have moreover remarked, that the greater part of these cupolas are situated in

passes difficult to get through, or at least in places well adapted for a hostile encounter. One thing is certain at any rate, namely, that they are all sepulchral tumuli; for having myself opened several of these cupolas, I have found in most of them, little urns of bronze, or other metal, or of baked clay, containing funeral ashes, or the debris of human bones; also jewels, and coins for the most part of Græco-Scythic, or Græco-Indian types.

The Muhammedans of the neighbourhood pretend to say, that the tope contained the remains of all the Musulmans who perished in the battle which took place in this place between the Afgháns and the army of Rájá MÁN; but besides, that the religion of Muhammed opposes the erection of monuments to the dead, (?) the antiquity of the building and of the medals it contained prove to be far prior to the time of the Muhammedan incursions.

The Hindus of the country resort to the spot to offer up the first cuttings of the hair of their male children—a custom which is said to have prevailed anciently in Greece.

Scattered over the site of the ruins of Mánikyála are seen the remains of fifteen other cupolas, smaller than the principal one just described. These I have lately been engaged in digging up, and they have furnished some very interesting discoveries. The excavation of a tope situated about a cannon shot distant from the present village of Mánikyála to the N. N. E. is particularly calculated to throw light upon these curious monuments of antiquity, since a part of the medals extracted from it bear genuine Latin characters, while others are of the Græco-Scythic or Græco-Indian type. Moreover, the stone which served as a covering to the niche which contained them, is sculptured all over with inscriptions in an unknown character, and altogether different from that of the coins\*?

This cupola is laid down as No. 2<sup>6</sup> in my map of the place. It was in a thorough state of dilapidation, so as hardly to be observed; and it was only after having carefully examined the contour of the foundation that I decided upon penetrating it. Its height might be 60 or 70 feet. I began by piercing it from above in the centre with a hole of 20 feet diameter. The materials extracted were chiefly a coarse concrete, extremely porous. The nature of the stone reminded me forcibly of the pyramids of Egypt, which are constructed of a limestone full of shell impressions, (nummulitic limestone.)

In my first operations, I found, at the depth of three feet, a squared stone, on which were deposited four copper coins. Below this point, the work became extremely difficult, from the enormous size of the blocks of stone, which could hardly be removed through the upper

opening. At ten feet lower down, or at ten from the level of the ground, we met with a cell in the form of a rectangular parallelogram, built in a solid manner, with well dressed stones, firmly united with mortar. The four sides of the cell corresponded with the four cardinal points, and it was covered with a single massive stone. Having turned this over, I perceived that it was covered with inscriptions.


In the centre of the hollow cell stood a copper urn, encircling which were placed symmetrically eight medals of the same metal, which were completely corroded with verdigris. The urn itself was carefully enveloped in a wrapper of white linen, tightly adhering to its surface, and which fell into shreds when I opened the urn\*. The copper urn enclosed a smaller one of silver: the space between them being filled with a paste of the colour of raw umber (*terre d'ombre*), in which the verdigris had begun to form. This pasty matter was light, without smell, and still wet. On breaking it, I discovered a thread of cotton gathered up into a knot (*ramassé en au seul point*), and which was reduced to dust on handling it. When I attempted to remove the silver urn from within the outer cylinder, its bottom remained attached to the brown sediment, and I remarked that the silver was become quite brittle from age, crumbling into bits between the fingers. Within the silver urn was found one much smaller of gold, immersed in the same brown paste, in which were also contained *seven silver medals*, with *Latin characters*. The gold vessel enclosed four small coins of gold of the Græco-Scythic or Græco-Indian type;—also two precious stones and four pearls in a decayed state; the holes perforated in them prove them to have been the pendants of earrings.

From the position in which these several urns were found, an allusion was possibly intended to the ages of the world. The four gold coins were of far inferior fabrication to those of silver. The latter are worn as if they had been a long time in circulation. Whether they are Greek or Roman, I cannot venture to affirm. I would only remark, that if the Greeks before the reign of PHILIP used the Latin alphabet, it might be probable that there were Greek coins, and that they were brought into the country by the army of ALEXANDER. If, on the contrary, they are Roman, they may be of the epochs when the kings of India sent embassies to the Roman emperors *Augustus* or *Justinian*. Or, it is possible that they are brought into the country through the ordinary channel of commerce by the Red Sea†.

\* The exterior of the copper cylinder of M. VENTURA'S tope has the marks of a cloth wrapper well defined on the corroded surface.—ED.

† While correcting the press of this passage we are put in possession of M. COURT'S drawings of the coins, which we will make the subject of a postscript.—ED.

The inscription on the stone is in a character that resembles the writing of the Rájputs of the Himálaya mountains in the present day. It has also a resemblance to the Ethiopian; and it is well known, that there existed from time immemorial a communication between Egypt and India. I am surprised that my friend General VENTURA did not find an inscription on the stone in the principal deposit of the large tope. On my way to *Peshávar*, I lately visited the scene of his operations, and searched carefully among the ruins for any such, but without success. This cupola was penetrated by him from above. When the cap was removed, a square shaft was found of 21 feet deep and 12 feet side, well constructed of squared stones. On the floor of this chamber there were two massive stones, between which was deposited a small box (see page 315). The floor itself was formed of two enormous stones, which were broken to pieces with some trouble before the digging could be continued below. The difficulties were much increased from this point by the frequent occurrence of large blocks of stone locked into the body of the masonry without mortar, which it was necessary to extract by the upper vent. At 27 feet below the first stage, a second was met with, of a less perfect nature, wherein a second discovery was made:—below this, again, before reaching the ground, the most interesting discovery occurred. Hence the miners worked a conduit underground, on the side towards the village of *Mánikyála*, which facilitated greatly the extraction of materials. This adit is now nearly closed up with rubbish, and can only be entered on all fours.

As the relics found in this cupola have been addressed by my friend to the Asiatic Society of Calcutta, I refrain from any observations on them. I will only remark, that the emblem on the gold medals of *Mánikyála*, as well as on those of my topes, may be observed in Persia with some slight difference, on the sculptures at Bistaun, near *Kermansháh*; I think also, the same symbol exists at *Persepolis*. I can with confidence assert that the monogram  exists on the bas-relief of the gate of the ancient castle of *Shastar* in *Susiana*.

I have observed that most of the cupolas of *Mánikyála* are situated on the ridges of sandstone rock which cross up from the surface of the country.

The neighbourhood is generally strewed with ruins, and traces of a square building can generally be perceived, in the immediate vicinity, of similar construction to that of a Persian caravanserai. If these monuments are the remains of temples, there can be no doubt, that *Mánikyála* must have been the principal seat of the religion of the country. The ruins of the town itself are of very considerable extent:—every where, on digging, massive walls of solid stone

and lime are met with—and a great number of wells ; but almost all now filled up : these latter are all built of cut stone. All the neighbouring heights are garnished with tombs ; and it is known that the ancient Persians, the Scythians, and even the Hindus selected eminences to erect their tombs on, especially those of their chiefs. They are all adjusted to face the cardinal points of the compass.

The whole country overlooked by Mánikyála must have been once a vast plateau, which in the course of ages, and by the continued action of the annual rains, has undergone a complete change. It is now cut every where into deep ravines, which render it very difficult to traverse. The country is sprinkled with wretched hovels ; but the natural aspect of the plains is singularly bare and barren. The immediate vicinity of the hills is, however, varied with the meagre foliage of a thorny shrub.

This district (canton) is now called *Patwár*. That it was formerly very populous, is proved by the quantity of ruins of old houses. According to the inhabitants, the whole space that now separates Mánikyála from the ruins of Tammiak, which is about 16 kros of the country distant, was so thickly covered with houses, that the two towns might be considered as one. They add, that mulberries and other fruit trees flourished there exceedingly. The devastation now witnessed can only be laid to the account of its being the thoroughfare of all the conquerors who in turns sallied forth to ravage India.

It appears that the aborigines of the country were Hindus, to whom were joined the *Pandavas*, worshippers of the sun, and the *Chandrabansís*, worshippers of the moon. Subsequently, a mixture took place with the Persians, the Scythians, and even with the Greeks, for the *Ghekher*s, so frequently talked of in the country, are nothing more than the descendants of the Greek colony that ALEXANDER left on the banks of the Indus, or perhaps the Greeks of the kingdom of Bactria, of which this district for a long time formed a part. What I here advance is upon good foundation, for the people themselves insist, that the Ghekher are descended from the *Khéianis*, ancient Persians, or from the *Rúmís* ; and it is well known that all Oriental nations apply this last term to Greece : hence we may conclude that *Ghekher* is but a corruption of the word *Greek*. Moreover, the numerous medals discovered with Greek legends tend strongly to confirm this idea.

The country appears to have been conquered by the Persians long before the time of ALEXANDER. This is proved by the Persian medals found ; further, an ancient tradition of Persia alludes to an invasion that our chronologists refer to the fourteenth century before Christ. It is also known, that under DARIUS, the son of Hystaspes, this country and all up to the banks of the Indus, formed one of the twenty satrapies of the vast Persian empire.



ALEXANDER traversed it in 326 B.C. At the death of this conqueror, it was annexed to Bactriana, raised into a separate kingdom by the Greeks, who revolted from his successors. It then fell into the hands of the Scythians, who destroyed this latter kingdom.

Splendid collections of coins might be made in this country. They are found principally at *Mánikyála*, *Djún*, *Pind-dádan Khán*; at *Níllí Daulla*, *Raval Pindí*, and in the districts of the *Hazáris* and *Hazáron*. They were formerly worked up into *lotas* and cooking vessels, and ornaments. It was only in 1829, the period when my researches commenced, that the inhabitants began to appreciate their value. The copper coins are most numerous; the fear of being supposed to have dug up a treasure leads the inhabitants to melt up those of silver and gold, which makes their preservation comparatively rare.

The immense store of coins constantly dug up proves that this country was formerly in a flourishing state; and that in consequence of the frequent invasions of India, its riches were constantly hidden by burial, and so preserved. By far the greater portion of the coins are Græco-Scythian, or Græco-Indian; others again are altogether Indian; the latter are the most ancient: they are in a Devanágari character now unknown to the natives. There are found also Græco-Persian coins, and sometimes pure Persian ones. These last represent the fire altar, with two guards to preserve it. I find that their costume has a striking resemblance to that of the present inhabitants of *Patwár*, who allow their hair to fall behind the head in large tufts of curls, and wear frequently the ample plaited pantaloons represented on the two warriors of the coins.

*Mánikyála* is at 40 kurors E.S.E. of the fortress of *Attok*, and at 34 N. W. of the city of *Jilim*.

The ruins of the town of *Ramma*, attributed to *Sita-Rám*, are at 13 kurors S. S. W. of *Mánikyála*. Those of *Parrala*, ascribed to the era of the *Pandavas*, are at 12 kurors to the north. The traces of the town of *Dangéli* are at 14 kurors on the east. This last place flourished under the *Ghekhers*, whose sovereigns fixed their residence there. *Makkhyala*, near *Rotds*: *Benda* and *Tamial* near *Ravel-Píndi* are also places formerly occupied by the *Ghekhers*.

#### IV.—Note on the Coins discovered by M. COURT. By JAS. PRINSEP, &c.

Since the above paper went to press, I have received through M. BERNARDY, the drawings made by M. COURT, of the several coins, and

I know not to which species of coin the above passage alludes: hitherto the number discovered in those parts with the Delhi character on them has been very small. The *Samagri deva* and the *Canouj* coins are numerous, but they are evidently much more recent than the Bactrian and Indo-Scythic.—J. P.

of the inscription alluded to in his remarks. The original drawings being destined for Paris, I have, with permission, had fac similes lithographed of the whole, as they are of the highest importance towards the elucidation of the history of the ancient monuments at Mánikyála.

Plate XXXIV. figs. 1, 2, 3, and 4, are the four coins found on the top of the large stone which served as a cover to the niche, containing the principal deposit. These coins are already well known to us, the first being the common copper coin of Kadphises (in this instance written ΚΑΔΦΙΣΤΣ): the other three being of ΚΑΝΗΡΚΙ. The reverses on the latter coins are however different from those described in my paper on the subject (page 449): the running or dancing figure of fig. 2, has occurred but rarely, among the coins heretofore collected, in comparison with the more common device of *Mithra* or *Nanaia*; and where it does, the name is less distinct. The reverse of figs. 3 and 4, is evidently the same personage as is represented on Gen. VENTURA's gold coin, standing in lieu of being seated; and my conjecture, that this figure had four arms, is now substantially confirmed.

The name is distinctly composed of the four letters OKPO, which I imagine may be the corresponding word in Zend for the Sanskrit अर्क *Arka*, a common appellation of ΣΟΥΡΑ, or the sun. The Hindu image of this deity is in fact represented with four arms, and is often accompanied with a moon rising behind the shoulders, just as was depicted on the Ventura gold coin\*. We can have little doubt, therefore, that in this device we behold the substitution of the Hindu form of the solar divinity for the Persian effigy of *Mithra*.

Plate XXXIII. Fig. 5, is stated by M. COURT to be a precise copy of the inscription found on the lower surface of the large slab of stone. This is doubtless the most valuable and important of his discoveries; for it will inform us of the precise nature and object of the monument in question. Although my progress in decyphering the character in which it is written, of which I hope shortly to render an account, does not yet enable me to transcribe the whole, still I see very distinctly in the second line the word *Malikáo*, king, in the very same characters that occur on the reverse of so many of the Bactrian coins. This so far throws light upon the subject, that it connects the monument with royalty, and prepares us to lean more favourably to the hypothesis advanced by all those who have been engaged in opening the topes, and supported by all the traditions of the country, that they are the sepulchral monuments of kings. I shall have to recur to this question presently in speaking of the liquid contents of the metal cylinders.

\* See Plate LXXXIX. of MOON'S Pantheon.

The same plate XXXIII. represents (reduced one-third) the position of the three cylinders, or urns, of gold, silver, and copper, as they stood in the niche of the under stone, surrounded by eight coins of copper, arranged in the directions of the cardinal points. The coins are mostly corroded, but they can all be recognized as belonging to ΚΑΔΡΗΣΕΣ and ΚΑΝΕΡΚΟΣ. Fig. 12, the one differing from the ordinary coins of this group, and bearing on the obverse the head of a king, with Greek legend, and on the reverse a standing figure of Hercules with his club, surrounded by a Pehlevi inscription, I know from other samples in my possession to belong to a monarch sometimes designated ΕΘΣ, while on others of his coins he is distinctly entitled ΚΑΔΦΙΣ. I have no hesitation therefore in ascribing this variety also to a monarch of the same family.

The contents of the several cylinders of M. COURT's tope were beyond all comparison the richest and most curious hitherto met with. The large tope gave M. VENTURA only two gold coins; that opened by M. Martin HONIGBERGER, presented only one gold medal of ΚΑΔΡΗΣΕΣ. Here, on the contrary, we have no less than four native gold coins, in excellent preservation, in the gold urn; and seven silver coins in the silver envelope: with this further peculiarity in the latter, that they are all of foreign origin.

The four gold coins are of a device familiar to us; they bear the legible inscription, in corrupt Greek, ΠΑΟ ΝΑΝΟ ΠΑΟ ΚΑΝΗΡΚΙ ΚΟΠΑΝΟ which I have described in my former notice. The figures on the reverse of the three first are of the Hindu cast, having four arms, with the epigraphe ΟΚΡΟ (the sun); they agree with that of the copper coins described in the preceding page. The last, figure 18, bears the title ΑΘΡΟ, a supposed ethithet of the sun; for an explanation of which see page 453\*.

The silver coins are entitled to a minute and individual examination; for, from the first glance, they are seen to belong to the medallic history of Rome, of which the most ample and elaborate catalogues and designs are at hand to facilitate their exact determination.

Fig. 19—is a silver *denarius* of MARK ANTONY, struck while he was a member of the celebrated triumvirate, charged with the eastern

\* In a pamphlet just received from Paris, entitled "*Observations sur la partie de la Grammaire Comparative de M. F. Bopp, qui se rapporte à la langue Zende, par M. Eugène Burnouf*," page 7, I find the very two words alluded to in p. 453, fortuitously occurring to rectify my conjectures as to their import—*āthre* is translated *au feu*, and is evidently an inflected case of our word *āthro*, which is thus proved to signify simply 'feu,' fire, (*ātars, le feu, ātash, P.*):—while a little farther, we find the words "si l'on trouve une fois dans le Vendidad-Sade, *maithra* pour *mithra*, s'est une faute du manuscrit, que l'accord des autres copies suffit pour faire apercevoir."—May not the same remark apply to the ignorance of the die engravers in writing ΜΑΘΡΟ for ΜΙΘΡΟ?

portion of the empire. It agrees with the description of a coin in VAILLANT, vol. ii. p. 9.

*Obverse.* M. ANTONIVS. III. VIR. R. P. C. (*Triumvir Reipublicæ Constituendæ*). *Device*, a radiated head of the sun, supposed to be the same as the Egyptian Osiris.

*Reverse.* The head of ANTONY, behind which the *lituus*, or crook, denoting him to hold the priestly office of Augur.

*Fig. 20.*—A silver *denarius*, recognized to belong to JULIUS CÆSAR, from the features, the inscription, and the peculiar device on the reverse. It corresponds with one described by VAILLANT, ii. 1.

*Obverse.* The head of CÆSAR, behind which a star. Medals of this kind were struck by AGRIPPA, ANTONY and others, in honor of CÆSAR, after his death; the star alludes to his divine apotheosis: the letters CAESAR... remain distinct.

*Reverse.* The group entitled in Latin, *Orbis, Securis, Manus junctæ, Caduceus, et Fasces*, supposed to designate the extended empire, the religion, concord, peace, and justice of the emperor.

*Fig. 21.*—This I imagine to be a coin of AUGUSTUS CÆSAR, although it does not precisely agree with any published medal of that Emperor.

*Obverse...* VFVS. III. VIR. Two juvenile heads, probably of CAIUS and LUCIUS. The circumscribing legend may be either of MÆSCINIUS RUFUS, a magistrate, (VAILL. ii. p.23,) or of PLOTIUS RUFUS, mint master, (VAILL. ii. 4,) the only two recorded names permitting a termination in VFVS. and at the same time being Triumvirs.

*Reverse.* A female figure holding probably a spear in the left hand. The few letters legible seem to form part of the usual inscription on the coins of AUGUSTUS. CAESAR DIVI F. (*Augustus Caesar divi Julii filius*).

*Fig. 22.*—The helmeted figure on this coin, and the unintelligible inscription on the reverse, lead me to ascribe it to the age of the Emperor CONSTANTINE, although I can find none in BANDURIUS nor VAILLANT, with which it exactly agrees.

*Obverse.* A head facing the left, with a handsome helmet.


*Reverse.* Two combatants, one clad as a Roman, the other as a German? a fallen warrior between the two. Beneath, the letters QIERMM.

The remaining three silver coins are in too imperfect a state to be identified: the first, fig. 23, bears the final letters of the word CAESARIS. The last, figure 25, has a female head with a mural crown, which may belong to a Greek city.

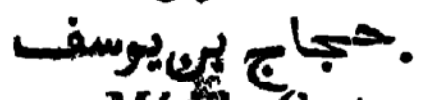

How or why these coins came to be selected for burial with the local coins of the Indo-scythic monarch, it is impossible now to conjecture; and it is certainly a most curious fact, that while in the neighbouring monument, the foreign coins consisted solely of those of the Sassanian dynasty of Persia, these should be entirely wanting here, and should be replaced by coins of Rome, many of which must have been regarded as antiques at the time, if I have been right in attributing the fourth of the list to CONSTANTINE. Such an assumption indeed removes all difficulties regarding the date, and brings about a near

accordance with the reign of SHAPUR II. of Persia, in the middle of the fourth century, the date already assigned to the principal tope from the presence of that sovereign's coins. We may therefore now look upon the epoch of the Hindu or Indo-seythian Rao KANERKI, as established from these two concurring evidences, and it may serve as a fixed point whence to trace backwards the line of strange names of other equally unknown and obscure monarchs, whose names are now daily coming to light through the medium of these coins, until they fall in with the well-known kings of the Bactrian provinces.

I once more <sup>\*</sup> <sup>†</sup> stop the press for the purpose of noticing a very important paragraph in the second volume of *Marsden's Numismata Orientalia*, this moment received from England, materially affecting the antiquity of the *Mánikyála* monument.

It will be remembered, that the Sassanian coins deposited there were all of that species distinguished by an ornament of two wings upon the head-dress, and that I assigned them on the authority of KER PORTER, and for other reasons which appeared conclusive, to SHAPUR II. A. D. 310 390. There was also on some of them a curious cypher, (vide Plate XXI) of  which seemed to defy scrutiny.

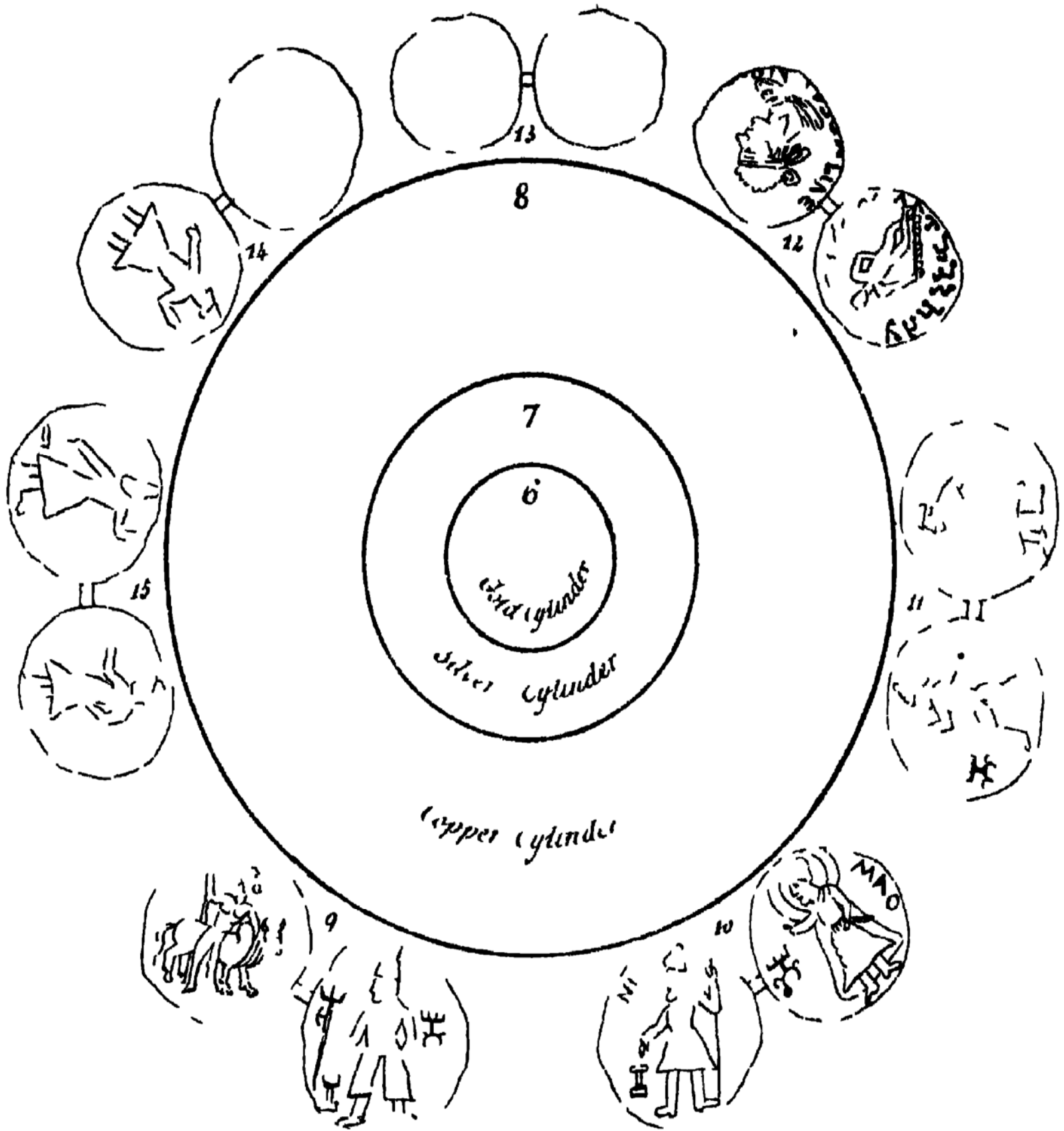
It seems that Mr. MARSDEN, on the authority of Sir WILLIAM OUSELEY, backed by the BARON DE SACY, attributes all this class of coins to *Khosrú-parviz*, A. D. 589, the Zend word *Hoslui* (for *Khosrú*) being stated to exist on many of them. They have also a cypher somewhat resembling the above.

A multitude of these coins have also been discovered bearing Arabic names, *Omar*, *Said*, *Harír*, &c. in addition to their usual inscription, and the fact had been explained by Mr. FRÆHN of the Petersburg Academy\*, by extracts from history, proving that the early Muhammedan conquerors of Persia retained the national coinage until 75-76, A. H., when the Khalifs AB-DUL MALEK, and HAJJAJ substituted their Cufic coin. MAKRIZI, in particular, makes the following decisive assertion: "OMAR caused dirhems to be struck with the same impressions as were in use under the KHOSROES, and of the same form, with the addition only of certain Arabic sentences, upon some, and upon others the name of the Khalif." The curious cypher above alluded to, is accordingly set down by the BARON DE SACY as *Arabic*, and he reads it, . The form in the original is a little different from our *Mánikyála* type, the termination of the first cypher having an opposite curvature . In this form it might possibly be read *Hajjaj*, although, as Mr. MARSDEN remarks, it is difficult to discover *bin Yúsuf* in the context:—but if the flourish upon the *Mánikyála* coin

\* This circumstance was pointed out to me by Captain JENKINS, as noticed on the cover of the last Journal.

Order in which the Urns were found in the stone niche.

[ reduced one third ]



5 Inscription on the Stone cover

Handwritten inscriptions in a cuneiform script, arranged in several lines. The text is written in a stylized, cursive form. The inscriptions are located below the diagram and are arranged in a roughly rectangular block.



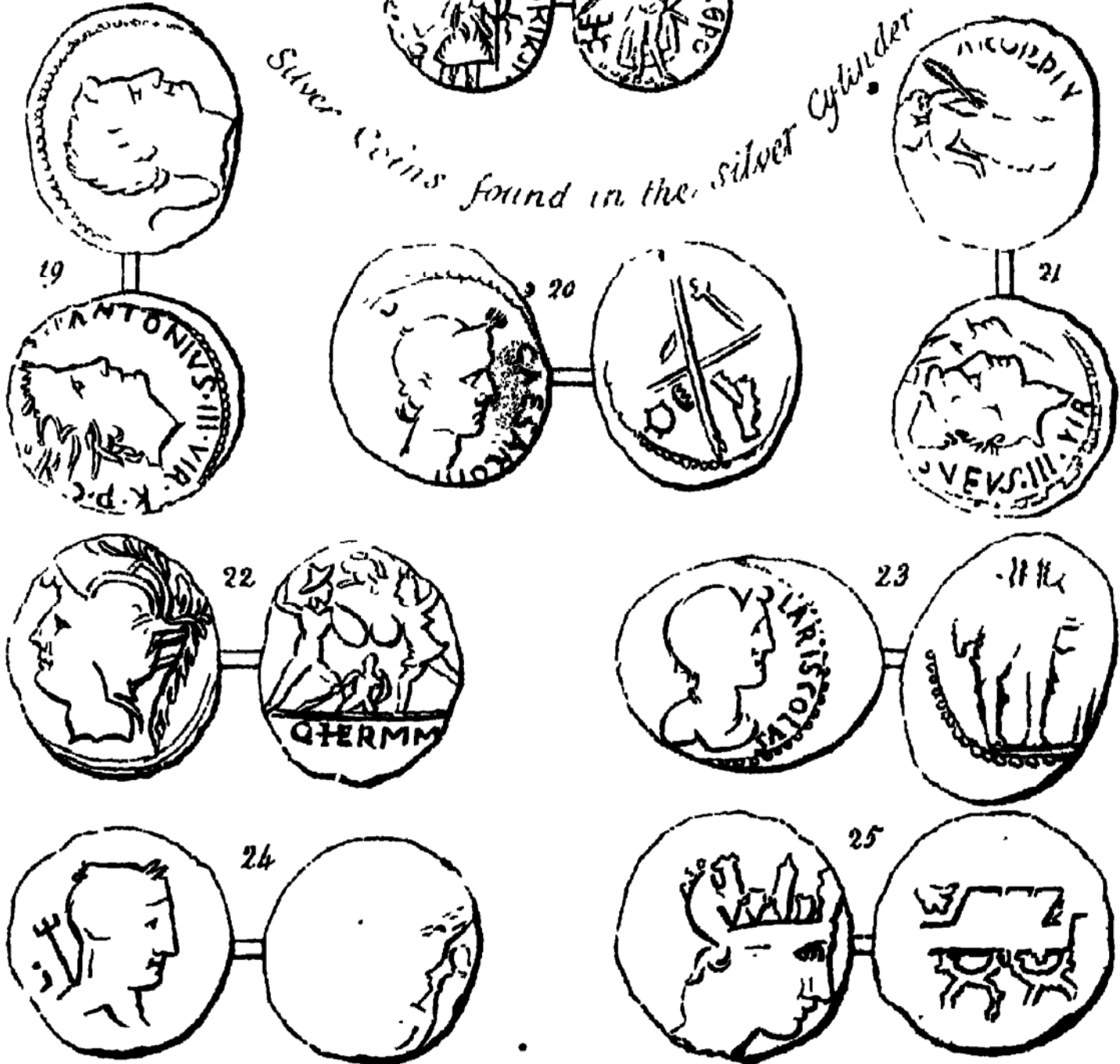
Copper Coins found above the stone Cover



Gold coins found in the gold cylinder



Silver coins found in the silver cylinder







is supposed to be identical with this, the interpretation is at once overturned; for it is no longer possible to construe even the first cypher into *Hajúj*, in accordance with the *BARON DE SACY*'s reading.

Be this as it may, the undoubted Arabic names and sentences upon so many of the winged-cap Sassanian coins, tend strongly to unsettle the date I had assumed, on the authority of these coins alone, for the Mánikyála tope, and to bring their construction down into the seventh century. But here again an additional difficulty arises with regard to the Roman coins just discovered by *M. COURT*. Is it likely that in a distant and semi-barbarous country coins of seven hundred years' old, should have been preserved and selected for burial in a shrine or tomb then erected?

The more we endeavour to examine the subject, the more difficulties and perplexities seem to arise around us; but it is only by bringing every circumstance forward that we can hope to arrive at last at any satisfactory conclusion. The two coins published in Plate XXI. will doubtless be considered of great interest by the illustrators of the Sassanian dynasty in Europe—they may destroy a favorite theory with them, as their evidence of the Arabic names tends to shake our deductions here; but we shall both be the gainers in the end, and eventually the service of an obscure history will be materially promoted by the collision of discoveries.

V.—*Note on the Brown Liquid, contained in the Cylinders from Mánikyála. By the same.*

The important discovery made known by *M. COURT*, in the memoir just read, of another metallic vessel or urn filled with brown liquid evidently analogous to that found by General *VENTURA*, in the great tope of Mánikyála, reminds me that I have not communicated to the Society, the results of my examination of this curious liquid. I will now proceed to supply this omission, referring to page 314 of the present volume, and to Plate XXII., for the particulars of its preservation, and of the vessels containing it. It now appears certain that the liquid was originally deposited in these receptacles, for had it permeated from the superincumbent structure, it would have filled the stone recess as well as the urn, whereas *M. COURT* particularly describes the former as empty and dry.

When the Mánikyála relics reached Calcutta, the liquid in the outer copper vessel was nearly dried up, and the sediment had the form of a dark-brown pulverulent crust, adhering to the inner surface of the vessels. It was washed out with distilled water, and preserved in glass stoppered bottles, in which, after several months, the greater part fell to the bottom, but the liquid remained still of a deep brown, and passed the filter of the same colour.

The liquor of the inner, or brass cylinder, having the consistence of wet mud, was bottled off separately.

1. In the innermost or gold cylinder, which rested in an oblique position in the brass case, a deposit of the brown matter had in the course of ages consolidated in the lowermost corner, differing from that formed by the rapid drying, in being very hard and of a shining vitreous or resinous lustre on fracture. It enclosed fragments of the glass (or *ambre brisé*, of M. VENTURA) (fig 22, a, b, c, d,) and when detached from the larger pieces of them, possessed the following properties :

Specific gravity, 1.92.

100 parts heated in a test tube gave off moisture, and a minute portion of empyreumatic oil, .....	20.0
The residue, heated red, lost of carbonaceous matter,.....	4.0
It then fused under the blow-pipe into a parti-colored slag, which pounded and divested in nitric acid, yielded of phosphate of lime (?) tainted slightly by oxide of copper,.....	12.0
The silicious or glassy residue, unexamined, weighed, ..	61.6
	100.0

2. The brown paste itself was next submitted to examination.

It was not soluble either in alcohol or ether ; and after once being precipitated by acids, evaporation to dryness, &c. it was no longer soluble in water.

Nitric acid boiled upon it took a light-yellow colour, causing a slight effervescence and a brown scum to rise to the surface of the liquid ; the greater part remained untouched and unchanged in colour. Sulphuric acid had no greater effect. The acid solution shewed the presence of copper in abundance.

When the brown liquid was gradually heated in a tube, to drive off its water, a slip of litmus and one of turmeric paper being introduced into the neck of the tube, there was not the slightest indication either of free acid or of alkali.

Acetite of lead threw down a heavy precipitate of a brownish-white colour, leaving the liquid clear.

The brown precipitate obtained by evaporation, when heated on platina foil, took fire for a moment, and then burnt like a coal, leaving an earthy residue, coloured by oxide of copper. When the decomposition was conducted in a test tube, reddened litmus paper being introduced, empyreumatic oil was given off with strong fumes of ammonia.

It being evident that the brown substance was chiefly composed of vegetable, with perhaps a little animal matter, carbonized and blackened by age, and mixed with earths and metallic oxides, a hasty approximate analysis was attempted in the following manner, to ascertain whether any trace of animal matter or bone was discoverable.

10 grains of the dried substance were introduced into a glass tube, to which a shape was then given by the blow-pipe, like the letter N ; nitric acid was introduced in the second bend, to arrest the ammonia, which might be driven over on the destructive distillation of the substance operated on. After gradually heating the closed end of the tube red hot, that portion was broken off, the charcoal weighed, incinerated, and the ash digested in nitric acid. From the resulting solution, ammonia threw down a copious white precipitate, redissolving the oxide of copper, which was thus carried through the filter. The precipitate heated, and weighed, was redissolved, and reproduced by ammonia ; while sulphuric acid

threw it down in a heavier form as sulphate of lime. It was therefore set down as phosphate of lime.

Without entering into details, the results of the analysis were as follows :

Empyreumatic oil, passed off through acid,.....	22.0
Ammonia and water, .....	19.0
Carbon, burnt off,.....	18.0
Silicious insoluble portion of ash, .....	9.0
Phosphate of lime, .....	10.0
Oxide of copper, and what remained in the ammonia, .....	22.0
	100.0

3. A separate examination of a few of the numerous yellow transparent fragments, which filled the inner cylinder, was then undertaken, principally with a view to determine whether they were of a crystalline nature, or simply glass; their behaviour under ignition having already convinced me that they were not “*ambre brisé,*” as supposed by M. VENTURA.

The specific gravity of the fragments at 77°.5 was found to be 2.40, in itself a conclusive argument as to their vitreous nature; but to render the matter still more certain, a large clear fragment was ground and polished with parallel faces, so as to admit of its being introduced in the axis of a polarizing instrument. The result was that in no position whatever could it be made to depolarize the polarized ray of light, a certain proof of its non-crystalline structure.

When the topaz-coloured fragments were boiled in nitric or sulphuric acid, their colour entirely disappeared, and the liquid being tested, was found to contain both oxides of copper and iron; the brown colouring matter seemed to be the same in nature as the brown liquid described and analyzed above, but it had penetrated the glass to a certain depth, and was not removable by boiling in plain water.

Heated before the blow-pipe, the glass underwent fusion imperfectly, and became opaque from superficial efflorescence.

Finely pounded and fused with carbonate of potash for some time in a platina crucible, then dissolved out with muriatic acid, a considerable portion of silicious matter remained undissolved in a flocculent precipitate, which was separated and weighed.

The solution tested for lead and lime shewed but faint traces of the latter, so that the artificial glass was composed principally of silicated alkali. It was not thought necessary to pursue the analysis farther.

From the preceding rough analysis it is clear that the fragments are of a vitreous nature, and it seems probable that pieces of glass were fraudulently introduced into the cylinder, in lieu of some precious stones, which the pious founder may have intended to deposit with the other contents of the monument.

It remains to offer a few remarks upon the *nature* of these curious monuments, of which two opposite theories seem to have been broached. The opinion of the inhabitants of the country, as reported by all our observers, is, that they are the tombs of ancient kings — that of Professor

WILSON, Mr. HODGSON, and other orientalists, that they are *Déhgopes* or *Bauddha* mausolea, containing relics of, or offerings to BUDDHA or SHÁKYA.

These two theories however may, I think, be reconciled in a very simple manner.

Are not *déhgopes*, or *chaityas*, in many instances at least, shrines built over the remains of persons of the Bauddha faith, and consecrated to their saint? If so, we have but to suppose the rulers of the Panjáb, at the period of the erection of the topes before us, to have been of this religion, and the desired amalgamation of opinions is effected. My friend M. CSOMA de Kőrös, in reply to my interrogation on the subject, expressly treats them as mausolea of the dead, and thus describes the objects contained in the modern *déhgopes* of Tibet :

“The ashes of the burnt bones of the deceased person being mixed with clay, and with some other things, (sometimes with powdered jewels or other precious things,) worked into a sort of dough, being put into moulds, are formed into little images, called ཨྲྀ ཨྲྀ, *tsha, tsha*, and then deposited in small pyramidal buildings, or shrines, (S. *Chaitya*, Tib. *mchhod-rten*, མཚོང་རྟེན་ vulg. *Chorten*,) without any great ceremony, and without any thing precious in addition.”

Such being the custom with the remains of ordinary persons at the present day, we can easily conceive that the quality of the caskets intended to contain the ashes of princes or priests in the flourishing era of their faith, would be of a superior description, and that coins and other precious substances would in some instances be added. In the *Mánikyála* cylinder, the pounded gritty substance contained in the brown paste was evidently such as M. CSOMA describes : the larger fragments of glass were, as before surmised, substitutes for precious stones, and the brown paste itself is to all appearance compounded of various vegetable matters now decomposed and carbonized, mixed up with a portion of the ashes of the deceased, as evinced from the presence of ammonia and phosphate of lime.

There is much similarity between these mounds, sometimes of masonry and sometimes of rough stones and earth, and the remains described by Mr. J. BABINGTON, under the name of *Pandor Kulis*, in the third volume of the Bombay Transactions. Those erections are also of two kinds : one a mere enclosure of stones, surmounted by a circular stone of an umbrella-shape, and thence called a *Topi Kul* ; the other, formed of a pit below the surface, in which a large jar is placed : the mouth of the pit being covered over with a large circular stone, the earth and grass of which give it the appearance of a tumulus or barrow : this species is denominated *Kodey Kul*, and it always contains human bones in a more

or less perfect state, besides urns, arms, implements, and beads of various shapes, colours, and materials\*. Mr. WILSON attributes these monuments to a very ancient Hindu practice of collecting and burying the ashes and bones of their dead, in places where no sacred stream was at hand, into which they might be committed. He quotes in support of this hypothesis, the following passage from Mr. H. T. COLEBROOKE'S *Essay on the Funeral Ceremonies of the Hindus*, in the seventh volume of the *Asiatic Researches*.

“Using a branch of *Sami*, and another of *Palasa*, instead of tongs, the son or the nearest relation first draws out from the ashes the bones of the head, and afterwards the other bones successively, sprinkles them with perfumed liquids, and with clarified butter, made of cow's milk, and puts them into a casket made of the leaves of the *Palasa*. This he places in a new earthen vessel, covers it with a lid, and ties it up with thread. Choosing some clear spot, where encroachments of the river are not to be apprehended, he digs a *very deep hole*, and spreads the *Cusa* grass at the bottom of it, and over the grass a piece of yellow cloth. He places thereon *the earthen vessel* containing the bones of the deceased, covers it with a lump of mud, moss, and thorns, and plants a tree in the excavation, or raises a mound of masonry.”

This is precisely the *Kodey Kul*; and the same authority helps us to an explanation of the *Topi Kul*, in which no bones are found.

“To cover the spot where the funeral pile stood, a tree should be planted or a mound of masonry be raised.”

“The one,” says Mr. WILSON, “commemorates the cremation, and is consequently nothing more than a pile of stones: the other inurns the ashes of the dead, and consequently contains the frail and crumbling reliques of mortality.”

The curious circumstance noticed by M. COURT of the eight coins symmetrically arranged around the central casket, calls to mind that part of the ceremony described in the passage immediately preceding the foregoing extract from Mr. COLEBROOKE'S *Essay*.

“The son or nearest relation repairs to the cemetery, carrying eight vessels filled with various flowers, roots, and similar things. He walks round the enclosure containing the funeral pile, with his right side towards it, successively depositing at the four gates or entrances of it, beginning with the north gate, two vessels containing each eight different things, with this prayer, “May the adorable and eternal gods, who are present in the cemetery, accept from us this eight-fold unperishable oblation: may they convey the deceased to pleasing and eternal abodes, and grant to us life, health, and perfect ease. This eight-fold oblation is offered to SIVA and other deities: salutation to them†.”

Although the foregoing extracts refer to the ceremonial of the orthodox Hindus, they may probably represent the general features also of a Bauddha funeral; for the Buddhists agree with them in burning their dead; and in afterwards consigning the ashes and bones to some

\* *Oriental Magazine*, vol. i. page 25.

† *As. Res.* vii. 255.

durable mausoleum. Dr. HAMILTON informs us that the remains of priests in Ava, after cremation, are preserved in monuments\*, and Mr. DUNCAN describes a marble urn dug up among the Buddhist ruins at Sarnáth, near Benares, which contain "a few human bones, together with some decayed pearls, gold leaves, and other jewels of no value," just of the same nature as those discovered in the Panjáb. There was also a similar precaution of enclosing the more precious urn in one of coarser material, (in this case of stone,) in order more effectually to insure its preservation. That the bones at Sarnáth, belonged to a votary of Buddha was confirmed by a small image of Buddha discovered close by, and by the purport of the inscription accompanying it†.

From consideration of these circumstances, therefore, in conjunction with the decided opinion of all those who have recently been engaged in the examination of the Panjáb and Kabul topes, the hypothesis of their being the consecrated tombs of a race of princes, or of persons of distinction, rather than mere shrines erected as objects of worship, or for the deposit of some holy relic, seems both natural and probable; or rather the two objects, of a memorial to the dead, and honor to the deity, seem to have been combined in the meritorious erection of these curious monuments.

I cannot omit noticing in this place, one of those singular coincidences which often serve to throw light upon one's studies. While our enterprising friends have been engaged in opening the ancient topes of Upper India, the antiquaries of England have been at work at some ancient Roman tumuli or barrows in Essex. Without intending to draw any conclusions from the facts elicited in the course of their labours, it is impossible to read the pages of the *Archæologia* (1834, vol. xxv.) without being struck with the similarity of customs prevailing in such distant localities, pointing as they do towards a confirmation of the many other proofs of the identity of origin of the Roman and the Hindu systems.

The sepulchral tumuli of Essex contained, like those of the Panjáb, various bronze urns, enclosing fragments of burned bones, glass, coins, and even the brown liquid itself! The liquid is described as being in some cases "of a light yellow, in others of a dark-brown," of which colour was also an incrustation about the exterior of the vessels. Professor FARADAY, who examined the liquids, supposes that the water was

\* Trans. Roy. As. Soc. vol. ii. p. 46.

† The square chamber without door or other opening discovered in digging the ruins at *Buddha Gaya*, and supposed by Dr. HAMILTON to be a tomb, resembles the square ornamented chamber penetrated by Dr. GERARD near Kábul, where he found the image of Buddha, described at page 455 of the present volume.

not originally placed in the urns ; but that it came over by a species of distillation into the empty space of the vases, on the alternate heating and cooling of the air contained in them. The researches of M. M. VENTURA and COURT may give reasons for thinking the contrary.

“The deposit on the side of the large vase was a dry flea-brown powder, containing a few white specks. It was combustible with a very feeble flame, burning like ill-made tinder or charred matter. It left a little pale light ash, containing carbonated alkali, carbonate of lime, and a little insoluble earth. This substance gave no trace of ammonia by heat. It is probably the result left upon the decay of organic matter, but of what nature, or in what situation that may have been, I cannot say.

“The liquor was a dilute solution of the same kind of matter, (4.2 grains to a fluid ounce :) this when dried and heated, did yield a little ammonia ; it blackened, but did not burn visibly.”

“A third bottle was found to contain a fatty substance like stearic acid, melting under 212°, burning with a bright flame, and leaving little ash. It was dark-brown on the exterior, and yellowish and semi-transparent in the middle : the brown coloring matter was separated by dissolving the fat in alcohol—it was supposed to be the residue of albuminous or gelatinous matter, but it yielded no trace of ammonia.”

Mr. GAGE, the author of the description, imagines the liquid to have been lustral water, poured in at the time of depositing the bones and funeral ashes. The pieces of fused glass adhering to the burnt bones, and the liquid, recalled to him VIRGIL'S description of the funeral pile of MISENUS.

— Congesta cremantur  
Thurea dona, dapes, fuso crateres olivo.  
Postquam collapsi cineres et flamma quievit,  
Reliquias vino et bibulam lavère favillam :  
Ossaque lecta cado textit Chorinæus ahenò.

The dark-brown incruusted powder of the outside of the urn was in the same manner referred to a decayed wreath of yew, or other dark vegetable, depicted in the lines.

————— Cui frondibus atris  
Intexunt latera et ferales ante cupressos  
Constituunt. *Æneid*, vi. 215.

The offerings at funeral sacrifices among the Romans consisted of milk, wine, blood, and such other *munera* as were supposed to be grateful to the deceased :—money was usually added to defray the charges of Charon's ferry.

The reader may compare this description with the extracts from COLEBROOKE ; before given, and draw his own conclusions.

As the opinions of all those who have visited the countries where these monuments lie, are particularly deserving of attention, I cannot



resist the temptation of extracting a paragraph concerning them from the Manuscript Journal of Mr. TREBECK, the companion of Mr. MOORCROFT, now in my hands for transmission to Europe. These travellers, it will be seen, visited the spot where Mr. MASSON has lately been so actively engaged. They procured some of the coins now so common to us, and they had received from native tradition the same account of the contents of the topes which has now been confirmed by direct examination.

“On the evening when we were encamped at Súltánpur, Mr. MOORCROFT, in the course of some inquiries learnt that there were in the neighbourhood a number of what the people called Búrjs or towers, which according to their accounts of them were exactly of the same form as that seen by us in the Khurbur country. In consequence of our stay at Bálá Bágh, we had sufficient leisure to return in search of them, and in the forenoon of the 8th, taking along with us a person in the service of Súltán Mahmud Khan, we set off towards the place where they were said to be. Our road lay between Súltánpur and the Súrkháh, and taking a guide from that village, we were conducted to the bank of the latter rivulet which we were obliged to ford. The water was so deep and rapid that a man on foot could not have got across it, and its color was quite red, from the quantity of red earth washed along by it. Having passed it, and ridden over some fields, belonging to a small Garhí, or walled hamlet, and over a piece of clayey land, much cut and broken by water-courses, we reached a narrow gravelly slope, joining at a few hundred yards, to the left, the base of the mountains bounding this side of the valley. Here we found a Búrj, but were a good deal disappointed by its appearance. It differed considerably from those we had before met with, and though certainly antique, was built much less substantially : its exterior being for the most part of small irregularly-sized slate, connected without mortar. A good deal of one side of it had fallen down, and there were others before us ; we did not stay long to examine it. We counted several whilst proceeding, the number of them amounting, as well as I can recollect, to 11, and seeing one more to the westward, and better than the rest, we advanced towards it. It was situated on a stony eminence at the base of the hills near where the main river of Kábul issues from behind them, and nearly on a line with the garden of Chahar Bagh.

“We ascended to it, and found it to be of about the same size as the one near Lalla Bagh, but as just observed of a different form. It was in a more perfect state than any of the rest in the same vicinity, but varied little from them either in style or figure. It was built upon a square structure, which was ornamented by pilasters with simple basements ; but with rather curious capitals. Were it a tomb, one might suppose the centre of the latter coarsely to represent a skull supported by two bones, placed side by side, and upright, or rather a bolster or half cylinder with its lower part divided into two. On each side of this were two large pointed leaves, and the whole supported two slabs, of which the lower was smaller than the upper one. The most curious circumstance in this ornamental work was, that though it had considerable effect, it was constructed of small pieces of thin slate, cleverly disposed, and had more the appearance of the substitute of an able architect, who was pressed for time, and had a scarcity of

material, than the work of one who had abundance of the latter, plenty of leisure, and a number of workmen at command. A flight of steps had formerly led up the southern side of this platform, but nothing remained of them except a projecting heap of ruins. On the centre of the platform was the principal building, called by the country people the Búrj, the sides of which had been erected on a perpendicular to half its present height. This lower portion of it was headed by a cornice, and was greater in diameter than the upper part of the structure, its top forming a sort of shelf round the base of the latter. Its centre was marked by a semicircular moulding, and the space between the moulding and the cornice was ornamented by a band of superficial niches, like false windows, in miniature, arched to a point at the top, and only separated by the imitation of a pillar formed as before noticed of slate. The upper part of the tower was a little curved inwards, or conical above, but a great deal of its top had fallen off. The effect given to its exterior by a disposition of material was rather curious. From a distance it seemed checked a good deal like a chess-board—an appearance occasioned by moderately larged-sized pieces of *quartz*, or stone of a whitish color, being imbedded in rows at regular distances in the thin brown slate before spoken of. I had just time, though hurried, to take an outline of its formation on a piece of drawing-paper.

“The use of these erections next became a matter of speculation, and Mr. MOORCROFT, having heard that coins were frequently picked up in various places near them, instructed a man the day after our return to proceed to the neighbourhood of them, and try if some ancient pieces of money were not to be found. The inhabitants of the Ummur Khail, a small village near them, said, that they learnt from tradition that there had formerly been a large city in this part of the valley, and pointed to some excavations across the Kábul river, which they told us had been a part of it. Of the coins they stated that several had been found of *copper*, but as they were of no value to them, they had been taken to some of the nearest bunnahs or shop-keepers, and exchanged for common pice. This information gave a clue to the person in search of them, and he succeeded at two or three visits to some Hindus of Chahar Bagh, Súltánpur, &c. in procuring several. He was also sent back to Jelálábád, but brought with him from thence only two pieces of Russian money, which were useless. The former were however very valuable and curious, and had on each side of them for the most part impressions of human figures; but from the frequency with which they were combined with representations of the elephant and the bull, it may be conjectured that they were struck at the command of a monarch of the Hindu, or Buddhist persuasion. The variety was considerable, and there were certainly two or three kinds which might have been Grecian, particularly one that had upon one side of it a bust, with the right arm and hand raised before the face with an authoritative air. Of this coin there were eight or ten, they were of about the same size as English farthings, and the figure spoken of was executed with a correctness and freedom of the style foreign to Asia, at least in the latter ages. The rust upon them, and the decayed state of the surfaces of two or three, as well as the situation in which they were found proved, that they were not modern. There were several more of the same size, merely with inscriptions in letters not unlike Sanscrit; and some other inscriptions, on the larger pieces of money, were so legible that a person, acquainted with oriental letters and antiquities, might discover much from them. With regard to the Búrjs, or buildings previously mentioned, Mr.

MOORCROFT'S opinion is probably correct. He conjectures that they are the tombs of some persons of great rank, among the ancient inhabitants or aborigines of the country; and as the religion of the Hindus seems to have been prevalent here in the earliest ages, that they have been erected, as records of the sacrifices of Sattis. But the question cannot be satisfactorily set at rest till one of them is opened. It is odd, that they should have escaped destruction, situated as they are in the full front of Musulman bigotry, and avarice; and, notwithstanding what some individuals assert, their present decayed state seems to be occasioned by age, rather than any attempt to discover whether they contain any thing valuable. A few people say that one of them was opened, and that a small hollow place was covered near its base, in which there were some ashes as of the human body."

VI.—*Journal of a Tour through Georgia, Persia, and Mesopotamia.* By Capt. R. MIGNAN, *Bombay European Regt., F. L. S. and M. R. A. S.*

[Continued from p. 463.]

On the 24th we started early in the morning for Tabríz. The weather continued so very cold, that whatever was moistened by the breath, immediately became ice. Our mustachios were distended into an icicle. During the early part of our march we had some slight deserts, and afterwards entered a pass surrounded by wild and barren mountains. From an elevated spot we observed the river Augi flowing through a deep valley below, which we shortly after crossed upon a stone bridge of three arches. We found the water of this stream extremely brackish; indeed, the soil of this region is so salt, that all the streams partake of that quality. At the side of our road we observed immense masses of rock, the surface of which appeared to have been worn by the action of water. Indeed, the whole tract wore the appearance of having been recently abandoned by the ocean, and formed one irregular broken waste which might be compared to the waves of the sea, changed into earth, at the heat of the agitation. The latter part of our journey was unusually rugged, and although I have seen much mountainous scenery, I can remember none that exceeded in difficulty the passes of Karadágh.

Nothing can be imagined less like the environs of a capital city than the aspect of the country on every side of Tabríz. For several miles, the traveller passes over a plain which exhibits little but sterility and abandonment. The gardens which at first resemble black spots on the desert, are all that direct the attention to the celebrated capital of Azerbiján. It looks like some older city, long deserted by man. The appearance of its mud walls, arising out of, and surrounded by ruins; the prison-like houses which seldom exceed one story, without a decent looking win-

dow to enliven them ; the inelegantly shaped domes, without a single Turkish minaret to relieve them ; all exhibit a most monotonous effect, and combine in a general *coup d'œil* to impress the traveller with a very mean opinion of Persian architecture.

Tabríz, or as it is generally called by foreigners, Tauris, is the Ganzaka of antiquity. It is situated in the province of Azerbiján, which in former times was called Atropatia, from ATROPATES the satrap, who, after the death of ALEXANDER, assumed the title of sovereign of the country, and transmitted it to his posterity, who retained the government for several centuries. It is asserted by some, that in the fourth century of our æra, a treaty was concluded between NARSUS king of Persia, and the Emperor GALERIUS ; by which contract TIRIDATES became its governor, and enlarged the city in emulation of the magnificence of Ecbatana. Yet we find that subsequent to this, it suffered various revolutions ; for when HERACLIUS entered its gates, there were only three hundred houses standing. On the accession of the Sefi race however, Tabríz regained its old importance. Sir JOHN CHARDIN mentions, that in his time the city contained half a million of souls. “ J’ai fait beaucoup de diligence pour apprendre a combien se monte le nombre des habitans de Tauris ; je ne pouvais pourtant pas le savoir au juste : mais je pense qu’on peut dire sûrement qu’il va à 550 mille personnes.” (*Chardin, Voyage de Paris à Ispahan, p. 184.*) But the earthquake of 1727, so greatly diminished its population, that only seventy thousand remained, and after the succeeding shock in 1787, there were only forty thousand inhabitants. If CHARDIN be correct, how dreadfully scourged this province must have been in the short space of forty-one years. Such were the awful changes of power and population, during the last century.

Tabríz is surrounded with a wall, and protected by a deep ditch which embraces a circumference of three miles and a half. The suburbs which have been built from ruins dug on the spot, occupy the ground which once composed the old city. To the north and east they extend for several miles, and so great is the mass of ruin about the plain in this direction, that I am convinced, the most violent shocks were experienced at some distance from the new city. Two hundred and fifty mosques are mentioned by CHARDIN, out of which the remains of three only are to be traced. The finest of these is, that of Ali Koja, erected by him six hundred years ago. It is still nearly one hundred feet in height, and commands a fine view of the surrounding country. Some time ago, a woman was thrown from its summit, for having murdered her husband. About two miles to the south-west of the city, the ruins of Sultan KAZAN’s sepulchre are to be seen. The remains of decayed

buildings are here most enormous. The appearance of the sepulchre is that of an elevated mound composed of the usual *debris*—bricks, lime, stones, and tiles. It is encircled by several arches, and other vestiges of departed grandeur.

The court of **ABBÁS MIRZÁ**, Prince Royal of Persia, is held at Tabríz. Of the fifty-five sons\* of **FATTEH ALÍ SHÁH**, he is the only one who ever made an attempt to raise a regular army, which continued in an efficient state, until the conclusion of the peace with Russia. At present, the Government cannot see the utility of entertaining men who are not absolutely required, and have in consequence disbanded nearly the whole army, retaining only a few Russian deserters. The serviceable part of the establishment however, consists of three British officers, (Capt. **SHEE**, and Lieutenants **BURGESS** and **CHRISTIAN**,) and eight sergeants, all of whom are under the immediate command of Major **ISAAC HART**, of His Majesty's 65th regiment of foot, an officer of the highest military talent, and determined bravery, who deserves far greater praise than I am capable of bestowing. Notwithstanding the insuperable difficulties this indefatigable officer has encountered, he has single-handed, organized, and held together all the prince's troops, and for the last sixteen years, the name of **HART** has been the admiration of every soldier in the Russian army on the frontier. The artillery have always been the most efficient part of **ABBÁS MIRZÁ**'s army, and the infantry scattered throughout the districts. The amount of the general disciplined force under the command of Major **HART**, which might be collected, is about 10,000. Previous to the late war, fifteen battalions, each 1000 strong, were regularly clothed and fed by His Royal Highness, together with nearly 10,000 irregulars, or *Túffangchís*: these are foot soldiers, armed with matchlocks, who were only nominally ready at a call, being dispersed among their own villages. As these men received little or no pay, it cannot create surprise, their never evincing great readiness for field service, or much firmness in action; especially when their wives and children were left during their absence totally unprovided with even the common necessaries of life.

The introduction of English discipline in Persia, would long since have been superceded by Russian, had it not been for the unceasing exertions of Major **HART**; and when we remember the avaricious habits, and the horrid depravity, into which **ABBÁS MIRZÁ** has lately

\* The family of His Majesty of Persia consists at present of fifty-five sons, and one hundred and twenty-five daughters. Many of his sons have fifteen and twenty children, and some of these are of an age to possess wives and husbands: so that, when the number of the king's issue is reckoned at a thousand, it will not appear incredible.

fallen, it becomes a wonder how he continues to retain any forces at all : and it may be added as a fact, that the Russian Government would give the Major any sum of money to quit the country. Count PASKEWITCH is so jealous of our intimacy with Persia, and so anxious to dislodge us therefrom, that he actually tendered officers to drill the troops entirely at the expense of his own employers ; and had it not been for Major HART's local power and influence, the Persians would have accepted of their services. When this officer quits Persia, the whole army must swarm with Russians, whose ambassador will not fail to gain an effectual ascendancy\*. Is this to be wondered at? the Prince Royal has intreated the Indian Governments to grant him officers upon their former terms ; to this they would not listen, so that he must eventually accept the services of Russia. When that day arrives our influence in Persia ceases, *perhaps* for ever †.

ABBÁS MIRZÁ has been formally proclaimed heir-apparent to the crown : this has been acknowledged by the two great powers of Europe, but it is a matter of much doubt and uncertainty, whether or not any other member of the reigning family, will ever be established upon the throne. The Kajurs, or royal tribe of Persia, are detested by all classes of people, and when the present Sháh dies, it is not improbable that an attempt will be made to exterminate the whole family. According to

\* Since the writer quitted Persia, he has heard with unfeigned sorrow that Major HART is no more. He may be permitted to embrace this opportunity of indulging his feelings by a brief record of his lamented friend. The name of ISAAC HART will not be read even by a common acquaintance without awakening sentiments of the deepest regret, for the loss of so much worth. With good talents he combined an invincible perseverance, a masculine understanding, and an energy of spirit. These endowments were accompanied by qualities of greater value—a purity of principle, a generosity of spirit, and an affectionate temperament of heart, which secured him the respect and regard of every individual of his acquaintance. He was on the eve of revisiting his native country, when unhappily his health broke down. He died at Tabriz, on the 11th day of June, 1830.

† It may not be inapplicable here to remark, that much of the success of the Russians in their intercourse with Persia, where their power is gaining the ascendancy over ours, is owing chiefly to the attention they pay to the acquirement of the Persian language ; for which purpose there are both at Moscow and St. Petersburg institutions, where the young men who are destined for missions are early prepared for that service ; and it is much to be regretted that no such institution in our own country places it within our power to cope with our neighbours in our relations with Muhammedan countries. The slightest reflection will convince even a common observer, that the negotiations of a *chargé d'affaires* at a Muhammedan court, who communicates personally with the supreme head, is infinitely superior to those of him who is obliged to employ an interpreter, who invariably turns your negotiations to his own account, or that of his highest bidder.

**OLIVIER**, this tribe is of Turkish origin. They took refuge in Persia, under the reign of **SHÁH ABBÁS I.**, whence they received the name of **Kajurs**, or fugitives.

During my stay at Tabríz, I was presented to **ABBÁS MIRZÁ** by his physician, **Mr. CORMICK**, of the Madras Medical Service. We were received in the hall of audience, which on entering we found so dark after the brightness of the sun to which our eyes had been exposed on the way, that we were unable to distinguish at first the objects within. The room was long and narrow, the floor covered with a carpet, which felt extremely rough when trodden, and which was so thickly embroidered, that the primary material was completely hidden. Upon this carpet, at the corner of the room farthest from the entrance, and in the centre of the border which had no cushions, Prince **ABBÁS MIRZÁ** reclined. The style of his dress was not different from that worn by all Persians of the higher order. He had on a pelisse of scarlet cloth, lined and bordered with black sable. From his waist projected through the sable the handle of his dagger, mounted with brilliants; and on his right side lay a Damascus sabre, the blade of which seemed to be of a value little inferior to that of its scabbard, which was of gold, enamelled, and ornamented with diamonds, and other precious stones.

In appearance **ABBÁS MIRZÁ** was about forty-five years of age; his countenance was handsome, though his features were not well-shaped. His eyes were fine, large, and of a deep black; his nose was lofty, and his look imposing, mixed, however, with an expression of ferocity. His jet eye-brows, and long bushy beard, formed so great a contrast with the paleness of his face, that I could scarcely persuade myself paint had not been used. His hands were also delicate, and on one of his fingers he wore a splendid diamond, which he often presented to view by bringing the hand into contact with his beard. He was excessively affable and polite; his manners were highly polished, and his expressions of civility wore that tinge of hyperbole, for which the natives of these countries are so remarkable. **SIR ROBERT KER PORTER**'s likeness of him gave me no idea of his expression of face; but I am told he is much altered since he fell into such habits of debauchery. His conversation turned principally upon the emigration of our countrymen to New South Wales, and of its climate and productions. He was highly amused at our description of the Kangaroo, and would not be persuaded that they were fit for *kabobs*—but, added he, "I would not hesitate in tasting of them, provided you set me the example; I then should see by your countenance, whether they were good." During the visit, **Dr. CORMICK** turned every thing I said into an extravagant compliment to the prince, and then demanded of me if it was not what

I intended to express. Dissent was of course impossible, so I allowed him his own way. After remaining in the audience room for about half an hour, we made two low bows, and retired under the escort of the *Kaim makím*, or prime minister, who accompanied us to the outer court, where we met our horses and returned home.

Not long ago, the Governor of Bombay, Sir JOHN MALCOLM, sent Prince ABBÁS MIRZÁ a very handsome London-built stanhope, which he sported about the suburbs of the city, and issued a proclamation that his ministers should forthwith provide themselves with similar equipages. The nature of the country is so good, that carriages might drive over it with nearly as much safety as upon a turnpike road. Persia is well adapted for carriages, and with very little trouble good roads might be made, except through the defiles from one plain to another, where the ruggedness of the mountain passes present serious difficulties. This was the case when wheeled-carriages were in use; for DARIUS after the battle of Issus, kept to his car as long as he was in the plain; but was obliged to alight from it, and mount his horse when he came to the mountains. It would have been well, if His Royal Highness had followed this prudent example upon his late hunting picnic; for on his attempting to ascend the mountains in his stanhope, the vehicle overturned, and was smashed to pieces, and the Prince had his head nearly broken. I was told that His Highness had chosen the fittest spot for such an achievement. Since this accident, he has quite forgotten to see his orders enforced either in building carriages, or constructing roads. Some of the *attachés* to our embassy have *droskies*, which are drawn through the narrow streets of the town by men; after which, their ladies are seated in them, and drive over the surrounding plain.

The Prince Royal is exceedingly fond of hunting and hawking—he generally goes into Karadágh; which is, in fact, his “hunting place.” Antelopes, partridges, and bustards are found there in great numbers. Such is the wonderful speed of the first-named animal, that no instance has yet occurred of their being fairly run down, except by relays of horsemen and dogs, after the manner described by XENOPHON of hunting the wild ass. He says, that the horsemen had no other means of catching them, than by dividing themselves into relays, and succeeding one another in the chase: *καὶ οἱ μὲν ὄνοι, ἐπεὶ τις διώκοι, προδραμοντες ἀνείστηκεσαν* (πολὺ γὰρ τοῦ ἵππου θάπτον ἔτρεχον) *καὶ πάλιν ἐπεὶ πλησιαζοὶ δὲ ἵππος, ταυτὸν ἐποιοῦν· καὶ οὐκ ἦν λαβεῖν, εἰ μὴ διαστάντες οἱ ἵπποι θηρῶεν διαδοχομενοὶ τοῖς ἵπποις.* (ANABASIS, lib. i. c. 5.) The antelope is equally common to Persia, as to Arabia, India, and Africa. It is the *δορκας*, mentioned by XENOPHON, among the wild animals which the Ten Thousand hunted on their march through Syria. The bustards are the *ὠτίδες*, for they



possess the same qualities which he describes ; making short flights, and tiring very soon. (ANABASIS, lib. i. c. 5.) The natives call this bird the *young antelope*. They likewise designate the ostrich by the name of a beast, calling it the *camel bird*. This appellation is apposite, for when the camel is seen on the desert from a distance, it is almost impossible to discriminate the one from the other.

I was often amused in my rambles round Tabríz, at meeting the Muhammedan ladies, who promenaded the streets, enveloped in their *chuders*. If no native was within hail, (as the sailors would say,) they invariably tossed off their veils, and in a sprightly manner expressed a desire to become better acquainted. The same forward air and manner was also displayed by the women, who often appeared at the latticed windows overlooking the road, and who manifested by their coquetry, and a peculiar laugh of the eye, the expression of delight at the attention they excited. As their faces were highly *rouged*, and their head-dresses gaily adorned, it forcibly called to my recollection, the history of JEZEBEL, how she *painted her face*, and *tired her head*, and *looked out at the window*\*. They have also a busy trifling with their veils, under the pretence of adjusting their hair ; during which time they do not fail to make the best use of their large gazelle-like eyes. In speaking of the women, I shall briefly remark that they have intrigue to their fingers' ends—*à la Française*. The higher classes are extremely profligate ; and when engaged in an *amour*, quit their home, wrapt in their impenetrable *chader* of one of their female slaves. There is no country on earth where the women have greater opportunities of gratifying their wicked propensities than Persia. Major HART assured me that when the Russians were in possession of Tabríz, most of the Persian nobles fled to the adjacent towns, and left their wives and their slaves in possession of their houses—and of their liberty. These women flocked at nightfall in such numbers to the citadel, where most of the Russian officers were quartered, that the sentries were compelled to repel them with the butt ends of their firelocks, or they would have been completely overpowered by the violent passions of these females. On their admission to the officers, who thought that fear had driven them for protection, they confirmed by expressive looks, and attractive gestures, that the object of their visit was by no means equivocal. I could illustrate this with many facts, but the present one will, I think, be sufficient to show that the Persians have some cause for *padlocking*

\* “And when JEHU was come to Jezreel, JEZEBEL heard of it ; and she painted her face, and tired her head, and looked out at the window.”—2 Kings, xi. chap. 30th verse.

their women. Indeed, the feelings which they have towards them is well expressed in the word "Zaifah," which we should translate into frailty, or weakness. Shakspeare's celebrated apothegm in Hamlet, "Frailty, thy name is woman," is highly characteristic of the Persian ladies.

Before finally quitting Tabríz, I may observe, that during the time of my stay, the weather was in general temperate. The thermometer in the shade ranged from 41° to 51°. The air was kept so constantly loaded with moisture by the melting of the snow, that LESLIE'S hygrometer never sunk below 50° in the shade; but when exposed to the sun, it sometimes rose to 95°. The sky was for the most part clear, and the air both keen and bracing.

We quitted Tabríz on the 31st of March, at the hour when the once-worshipped god of the Persians was lifting his glorious forehead over the heights of the city, and from every mosque the Mussulmans' loud voice called on all true-believers to rise to their orisons. Our first stage was made to the village of KHOSRU-SHÁH, distant about four far-sangs, or sixteen miles, and seated in the fertile and lovely valley of Uz-KOH. On our route we passed the village of Sardery, which presents itself from an eminence, and occupies the base of a hill, upon the summit of which are the ruins of a fort. From this spot I took some geographical bearings. The city we had left, and the over-hanging mountains were on our right, while the peninsula of Sháhí was on the left. The bed of the salt stream which we crossed previous to our arrival at Tabríz pursued its tranquil course through the plain, from the gorge of the mountains, whence it escapes, to the head of the lake Ourumia, where it discharges itself, and is lost altogether. The disposition of the surrounding plain would lead to the idea, that the lake once extended over it, and such is the delusive effect of the mirage, which plays over its saline surface, that it is very difficult to believe what one sees is vapour and not water. This optical deception has been noticed from the remotest times. It is alluded to by the prophet Isaiah, when he says, "And the parched ground shall become a pool." (Chap. xxxv. v. 2.) And again, "I will make the wilderness a pool of water." (Chap. xli. v. 18.) QUINTUS CURTIUS, in describing ALEXANDER'S march through the Sogdian desert, says, that "the plains wore the appearance of a vast and deep sea," (QUIN. CUR. lib. vii. chap. 5,) which is a true and perfect description of the mirage of the Persian and Arabian deserts. Bishop LOWTH has rendered what we read "parched ground," in our Bibles, into "glowing sand," (Isaiah, xxxvth chap. 7th verse,) which is highly expressive of this illusive appearance.—(LOWTH'S Isaiah, chap. ix. page 88.)

In winding round the same range of mountains which surround Ta<sup>h</sup>bríz, and which are a ramification of the Sahand branch, we observed innumerable villages, embosomed amongst trees, while the snow-capt heights of the Sahand mountains rose above the valley, and gave the whole a most picturesque effect. From this village to Dehkargám, a distance of full twenty miles, the country is a level plain, over which we saw flocks of the bustard, and several large foxes; but owing to their extreme shyness, we could not approach either sufficiently near to obtain a shot at them. Shortly before we caught the first view of the town, we could observe Lake Ourumia spreading its unruffled waters through a succession of rugged promontories, of which, a towering snow-peaked range, which fringes the horizon, forms the most magnificent feature. Dehkargám is encircled by a mud wall, and surrounded with extensive gardens and orchards. Trees were now assuming their dress, their foliage shot forth in great luxuriance, and wore a charming colouring to the landscape. This town was the head-quarters of the Russian cavalry at the time Field Marshal PASKEWITCH was carousing in the capital of the province. The whole district is wonderfully productive, and a beautiful foraging country.

April the 2nd.—We proceeded to Khaniah over a tract of mountain glen of about sixteen miles, destitute of the smallest symptom of habitation or culture. The very rills disappear, and the water oozes out of the rocks in springs, which no frost can congeal. Now and then a little noteless bird darted across the road, and appeared to eye us from a distance, as he balanced himself on the point of a reed. Cattle, nearly as wild-looking as deer, snuffed the wind as we neared them, and gambolled on the firm footing which they well knew among the marshes. We distinctly heard the hawk's cry as he skimmed along the rugged cliffs, and the yellow-winged earth-bee boomed round us, and with a bold hum spun away to the marshy shore of Sháhi.

The hamlet of Khaniah lies upon the margin of the lake, and were it a little more elevated, would command a grand view of it. The face of the mountains which gird its western shore, wear all the appearance of a volcanic region. The rugged aspect of the Kurdistán chain, the deeply furrowed ravines on either side, the romantic forms of the jagged rocks, all prove that the surrounding country has been the scene of some convulsion of nature. A little before we entered the hamlet, we saw several chalybeate springs bubbling from the earth, and a few yards further on, some curious petrifications are situated. These consist of several pieces of water contained within the circle of a mile, whose sluggish shallows stagnate and petrify by a slow and regular process, producing that stone which in the country is called Tabríz

marble. The water appears as if it were frozen, and when the stagnation is complete, a man may walk over it. The tendency of this water to become stone is so great, that where it exudes from the ground, the petrification assumes a globular shape, like the bubbles of a spring suddenly arrested in their play by a magic wand, and thus converted into marble. The stone is nearly transparent, very brittle, and often streaked with veins of various colours. Its general appearance is that of alabaster, and it is capable of receiving a fine polish. It is devoid of fissure, and may be cut into immense slabs. Rushes grow abundantly in the ground around, and the neighbourhood is both saline and marshy. This remarkable natural curiosity bears north 20 west, and is about two miles from the lake.

There are few objects more calculated to arrest the attention of the traveller than this lake, which is considered the Spauto and Marcianus of STRABO and PROLEMY, and is now called *Deriáh Sháhi*, the Sea of Sháhi, or the Lake of Ourumia, from a town of that name situated on its western bank. This town is the site of the ancient Thebarna. The very same extraordinary circumstance is remarked here as on the shore of the Dead Sea. There is no visible outlet to the lake, notwithstanding fourteen rivers are daily flowing into it. No increase in the height of the water is perceptible: on the contrary, signs of diminution are very apparent; so that the evaporation is greater than the body of water sent into it. There is a very close resemblance between the Lakes Asphaltés and Ourumia. No living creature is found in either; for as soon as the rivers carry down any of their fish, they instantly die and become putrid. Their waters are the same, intensely cold, and to the taste appearing like a mixture of lime, nitre, and magnesia. The indefatigable and lamented African traveller BROWNE, found by an experiment that this noble sheet of water contained one-third more salt than the sea. IBN HAUKEK also remarks, that its waters are so exceedingly salt, no fish can exist in them; and he likewise adds, that its length is about five days' journey. The extreme length of the two seas are the same, seventy miles; but Ourumia is thrice the breadth of Asphaltés, being about thirty miles. It contains five islands and a peninsula, which are nearly untenanted, except by venomous snakes and other reptiles. Dr. THOMAS SHAW, in his *Travels into the Holy Land*, calculates that the river Jordan daily sends into the Dead Sea six millions and ninety thousand tons of water. "So great a quantity of water," he continues, "being received without any visible increase in the limits of the Dead Sea, hath made some conjecture, that it must be absorbed by the burning sands: others, that there are some subterraneous cavities to receive it. Provided the sea should be seventy-two

miles long, and eighteen broad, and six thousand nine hundred and fourteen tons of vapour being allowed to every square mile, there will be drawn up every day above eight millions, nine hundred, and sixty thousand tons. As the heat of the sun is of more activity here than in the Mediterranean Sea, exciting thereby a greater proportion of vapour; so the Jordan may, in some measure, make up this excess by swelling more at one time than another; though, without doubt, there are other rivers, particularly from the mountains of Moab, that must continually discharge themselves into the Dead Sea\*." Although none of the rivers flowing into the sea of Shábi, are so large as the Jordan, yet collectively they cannot fail to make up an immense mass of water. It is perfectly impossible to form an estimate of the proportion of the supply to the evaporation, because all Persian rivers overflow their banks in spring, and at the end of autumn are mere rivulets.

Just as the sun was on the eve of setting, I proceeded on foot to the shore of the lake. An awful silence hung over it, but the sound of its waters slowly rolling before the wind, which blew at the time, were even more appalling than the desolation of its shores. In this solitude I felt something approaching to pleasure from the sight of a hawk, which passed over the unnavigated waters. This incident arrested the course of those feelings, which divine indignation forces upon a traveller who visits the Dead Sea, though the assertion that no birds can fly over that sea, on account of the pestiferous vapour inhaled from its surface, has received a marked contradiction by our latest travellers. I have already remarked that no fish exist within the waters of Lake Ourumia, having made particular inquiries at the village, whose inhabitants have often spread nets in vain; nor did I observe on the shore any shells whatever, or find, in truth, a solitary tree of any species. On the whole, the vast wilderness, and dreadful sterility of the same, is sufficient to impress a beholder with feelings of awe and dread. I remained about half an hour on the shore, and filled a bottle with the water. The shades of evening were approaching, the glorious lamp of night was watching, as it were, a close of day, to illuminate benighted worlds; and my village guide represented the danger of remaining longer, since a surprise might be apprehended from some of the wandering tribes, who are ever on the watch for prey. In consequence of this we returned to the village. We continued our march from hence, going south, over a barren tract of dark mountains, totally devoid of vegetation. The soil was argillaceous, and now and then the road lay over deep strata of rock, among which talc was predominant. Previously


\* Vide *Travels into Syria, and the Holy Land*, by Dr. THOS. SHAW, F. R. S.

to leaving the flat waste surrounding Deriáh Sháhlí. we gazed upon the marsh which renders Sháhlí a peninsula. Far off, to the west, we saw the cloud-diadem that crowns the chain of mountains which divided the old Assyrian and Median empires, and other mountain ranges, all accustomed "to parley with the setting sun." Shortly afterwards we were hid from the lake altogether, but obtained a more expanded view as we descended from the mountains towards Ajub-shir. From hence, the lake itself appeared as in the bottom of a bowl; we could now observe all its islands, which lying in a cluster, had the appearance of a little glimmering archipelago. From this point of "various view," the wide prospect of the windings of the river that issues from the adjacent mountains was suddenly descried. Ajub-shir is a small village, situated upon one of the fourteen rivers that flow into the lake, and which takes its birth from among the Sahand mountains. It is, as well as several other villages on the plain, the property of Jáfer Kúli Khán, the opulent chief of Marágha. This man is one of the greatest land proprietors in Persia, and the bitterest scourge in Azerbiján. Although the condition of the peasant is miserable in this province, he is in general industrious, and infinitely superior in intelligence to the ryots of British India. It is impossible to conceive the life of misery, which the peasant passes under the wild caprice, and perpetual irritation of Persian tyranny—the exposure of his dearest interests to brutal passion, or malignant power; his constant fear, that the fruits of a life of labour will be sacrificed to the avarice of some insolent slave, raised into sudden authority by his superior villainy, and sent forth to live by plunder and rapine. God forbid, that the day of oppression may not have an end; that man, however defiled with the dust of slavery, may not wring the scourge from the hand of the tyrant, and clear away the stain!

We reposed at Ajub-shir a great part of the day, as all the beauty tended towards the west, each hour deepening the prospect into the mellower splendor. To keep the eye from reposing on the lake, was indeed impossible; its still waters soothed one's soul, without holding it away from the mounts and cliffs, that forming of themselves a perfect picture, are all united with the mountainous region of the west. Towards sun-set we proceeded onward, and met the shepherds driving their flocks towards the village. The husbandmen were returning home from the toils of day, and from every house the smoke ascended in an undeviating upright direction.

"Et jam summa villarum culmina fumant,  
Majoresque cadunt altis de montibus umbræ."

We soon descried the rich town and fertile district of Bináb, which is distinguished by its extensive orchards, and its hamlets environed by trees and cultivation. From hence not only the great expanse of the lake is seen, but the full extremity of the plain to the northward. We stopt the night within the cottage of a tobacconist, and renovated our strength by smoking a choice collection of chibouques. After this we were served with two boiled fowls, lying in a small ocean of the milk of goats thickened with the whitest of rice. "Here's a dish fit for the cousin of the sun," exclaimed our host, rubbing his hands, and smacking his lips with expectation. "Bismillah," he added, as a signal for us to commence operations, and his fingers were in the dish in a moment, and in another, the tenderly boiled fowl was dissected limb by limb. "By the mouth of Muhammed, this dish is a savoury meal!" To this I perfectly agreed, for the pilau was capital; and to do the Persians justice, it must be said, they excel in this dish; in truth, Persia is the only country where it is cooked to perfection. While we were discussing the fowls, I perceived several damsels looking at us through the crevices of the harem door; and if I may judge from a few hasty glances, I should say, that my host had a good taste in women. In presenting me a kaleún, I was surprised to see him produce a bottle of wine from a curtained recess, which appeared well filled with jars; and after taking a few copious draughts, I could easily observe that he was getting fuddled, so I knocked the ashes from the top of his pipe, which he finished with as much satisfaction as if he had only begun it. He then stretched himself out on the floor, and fell asleep.

Bináb is encircled by vineyards to a considerable extent, which yield a grape celebrated throughout Persia for the good wine it produces. No one was abroad, although it was early day when we departed for Meándáb, distant twenty-five miles, over a wearisome country. After toiling over a succession of hills that separated the plains, and looking upon the country below, the eye wandered unreposed over a boundless brown expanse. The hamlets which were spread over the plain, appeared like spots upon the surface of the ocean. As we journeyed on, we saw the cultivators on the ground: their agricultural implements were of the simplest description. The plough, for instance, was formed of two wooden beams, one of which was placed athwart-ways, to yoke the buffaloes or oxen together, and at the extreme end, a shapeless wedge of iron was affixed to turn up the earth: thus  About noon we reached the banks of the river Jakantú, and found a rude kind of raft constructed of beams placed across inflated sheep-skins, which was to convey us to the opposite shore. This raft closely resembled the *kellek* of Assyria, a description of which

is given in my work on Chaldæa, published in 1829, by Colburn. The stream appeared about thirty yards wide; its waters were rapid, and occasioned great difficulty, and no short time in getting the mules over. On embarking, the ferrymen pushed off the raft, and rowed it with sufficient ease, till they got into mid channel; when we were carried with the greatest rapidity along with the stream to a considerable distance. During the whole time the boatmen were shouting, "God preserve us," and one of them, who was very alert, managed to bring us to a shoal near the bank, when he leaped into the river, and contrived to stay our course, to admit of our casting the horses and mules adrift, and so lightened the boat, as to disembark us on the bank. They then re-crossed the stream, after towing the raft to a certain height, up the southern bank, and far beyond the point of embarkation on the opposite shore. Two miles below this ferry, the stream is generally fordable, as the waters have become shallow by expansion; and I was told, that in the depth of winter, it freezes so hard, as to admit large káfilahs to cross its surface, though from the apparent rapidity of its course, I should be inclined to doubt this information.

The Jakantu flows into the sea of Sháhí, and is a branch of the Kizil Uzán\*, the banks of which river became the scene, a few years ago, of the mysterious murder of the celebrated traveller BROWNE; and although His Britannic Majesty's Ambassador, Sir GORE OUSELEY, was in the country, and in fact, very close to the neighbourhood of this sad catastrophe at the time it occurred, yet (strange to relate) no resolute and determined measures were taken for the apprehension of the perpetrators. I have not the least hesitation in saying; that his Majesty of Persia was accessory to this murder; indeed, it was the current opinion in the country at the time: but unfortunately, our character was not then in very high estimation at court. Mr. BROWNE's ultimate object was to investigate that magnificent country, Khorasan. The present Sháh appears determined that no traveller shall have his *real* protection, if their journey is in that direction. Although Mr. FRASER has presented us with a very valuable account of some parts of it, yet his sufferings were great, his obstacles almost insurmountable, and his treatment infamous. For this our travellers have to thank

\* This river is the Amardus of Ptolemy, and is supposed to have been the Gozen of Scripture. Its present appellative is descriptive of the yellow hue of its waters. Its course is both tortuous and rapid, and being augmented by several streams from the neighbourhood of the village of Banna, which is seated in the north-eastern branch of the Kurdistán mountains, it sweeps along through an Alpine country, till it enters Ghilán; where rushing onwards through a beautifully wooded country, discharges itself into the Caspian Sea, a little to the eastward of Resht.



their protector and friend FATTĒH ALI SHA'H. His Majesty dislikes to hear of any British travellers penetrating into Khorasán, and he seldom fails to use his best endeavours to make them adorn a tale, in stead of telling one.

His Majesty is the most accomplished liar in the kingdom, (in Persia, lying is considered one of the "*most fashionable accomplishments.*") Whoever doubts the authenticity of this assertion, had better close my pages, and consult those travellers of the last, as well as the present, century; he then can judge for himself. For gain, a Persian will commit the most heinous crime under heaven, and falsehoods flow spontaneously from his lips, even when no apparent motives exist. In speaking of the Persian character, it will be found to be the natural result of the circumstances in which he is placed. A Persian is more apt to defend himself by cunning than courage, and is so dependent on the help of others, that he knows not when to trust to himself: he calls on "Khúda" when he ought to exert himself, and sheds tears when he should show spirit. He makes splendid professions when he knows his sincerity will not be tried, and is at once mean and ostentatious. In a word, his character is made up of selfishness, avarice, treachery, deceit, and cruelty. Lord HEYTESBURY once asked me to tell him their *real* character. My reply was this, "They surround you like the flies with the sunshine, to disappear when you are under a cloud. It is impossible to avoid their buzzing; but God help the man that does not know how to appreciate the value of their lip-deep friendship."

(To be continued.)

#### VII.—*Proceedings of the Asiatic Society.*

*Wednesday Evening, the 3d December, 1834.*

W. H. MACNAGHTEN, Esq. Vice-President, in the chair.

SIR JOHN PETER GRANT, Kt., and WILLIAM GRANT, Esq. proposed at the last Meeting, were balloted for, and duly elected Members of the Society.

Read a letter from HENRY ASHTON, Esq. President of the Athenæum at Liverpool, acknowledging the receipt of the 2nd part of the 18th volume of the Asiatic Researches.

#### *Library.*

The Secretary apprized the Meeting of the arrival of the paintings, &c. presented to the Museum at the last Meeting, by Captain R. HOME; he also laid the minutes of the Committee of Papers, regarding the necessary preparations requisite for their reception, which were confirmed.

The extensive library also presented by Captain HOME, consisting of 300 volumes, principally of valuable works on architecture and painting, were laid out for inspection on the table.

Read a letter from Professor H. H. WILSON, enclosing statements of account with the Society's booksellers, MURRAY and Co., and PARBURY and Co. by which it appeared that a trifling balance remained in the hands of the latter. Professor WILSON enclosed a letter from Mr. J. MURRAY, regarding the publication of MOORCROFT'S Journal, about which no definitive arrangement had as yet been concluded.

Read a letter (in Latin) from the Hungarian Society, at Pest, stating the objects of its recent institution, and desiring an interchange of publications. The first volume of the Transactions of this new Society, in the Hungarian language, with the statutes in Latin, and various miscellaneous pamphlets, were presented.

The following books were also presented.

Lea's Contributions to Geology,—*by the author.*

The Indian Journal of Medical Science, No. 12,—*by the Editors.*

Illustrations of the Botany and Natural History of the Himálayan mountains, &c. Part 3. By F. J. ROYLE, Esq. F. L. S. and G. S. M. R. A. S.

Meteorological Register for October, 1834—*by the Surveyor General.*

*Museum and antiquities.*

Read a letter from W. H. MACNAGHTEN, Esq. presenting various weapons, consisting of a bow and arrows and two swords, richly mounted in silver and gold, used among the Coorgs.

The sword, without a scabbard, is slung in a curious belt, fitting to the middle of the back. A short knife is also worn in front with a silver chain, and paraphernalia for the matchlock. The weapons were accompanied with five native drawings, shewing the mode of exercise adopted by the Coorg troops.

Read a letter from Captain JAMES LOW, M. A. S. C., dated Province Wellesley, 16th October, announcing that he had forwarded under charge of Major SUTHERLAND, the facsimile of an inscription on a stone slab in his possession, which was discovered by him near the ruins of an old Buddhist temple in Province Wellesley.

The inscription is stated to be in some ancient form of the *Bali*, or *Pali*, character. It is not yet arrived.

The Secretary exhibited to the members present some selected specimens from the rich collection of Gen. VENTURA'S coins brought down by the Chevalier ALLARD; to which allusion was made at the last meeting.

On a cursory examination of these coins, the following classification was readily made on account of their very excellent state of preservation. They comprise many names altogether new, and many very valuable and curious medals of pure Bactrian workmanship, along with a number of the Indo-Scythic coins, and several of the peculiar gold ones, of *Rao Nano Rao*, &c. with the inscriptions clear and distinct.

*Catalogue of General Ventura's Bactrian Coins.*

Of DEMETRIOS, one beautiful small silver coin.

Of EUKRATIDES, one large and one small ditto; and three copper.

Of AGATHOCLES, one fine silver didrachma.

Of PHILOXENOS, one large silver, one square and one round copper.

Of APOLLODOTOS, 11 small circular, and one ditto square silver coins, quite perfect; and eight copper square coins, one round ditto.

- Of MENANDER, two small silver, and one copper square.  
 Of ANTIMACHOS, one small silver coin.  
 Of NŌNOS, three small silver coins.  
 Of AZILISOS, one silver drachma, and two copper pieces.  
 Of ERMAIOS, nine copper coins.  
 Of MAYOS, two very singular copper medals.  
 Of NICEPHOROS ANTILAKIDOS, seven small square coins.  
 Of AUSIOS, one square ditto.  
 Of AZOS, one large and 11 small silver coins; also 66 fine copper coins of the same prince, with seven distinct devices, none having the Sovereign's head, but generally exhibiting the figures of animals.  
 Of EOS? (the name only well defined on a few), 22 copper coins.  
 Of KADAPHES CHORANOS, six small copper pieces.  
 Of UNAD PHERROS, 23 copper coins.  
 Of KADPHISES, large copper 18, small ditto 68 coins.  
 Of KANERKOS, the Raja and Mithra form, copper, .. .. 45  
     Ditto, a elephant, .. .. 34  
     Ditto, the sitting figure, leg up, .. .. 32  
     Ditto, the running figure, .. .. 4  
 Gold coins of the *Rao Nano Rao* group, .. .. 10  
     of the Kanouj group, .. .. 3  
 One silver coin of the Behut type.  
 Besides Arsacian, Sassanian, Cufic, and modern Persian coins, and a number of decayed and illegible coins.

#### *Physical.*

Read a letter from Lieut. W. E. BAKER, Engineers, forwarding a drawing of the fossil elephant's tooth presented to him by the Nahun Raja, in whose country it was found, as mentioned in Captain CAUTLEY's note read at the last meeting.

\* [This will be published in our next number.]

On the subject of fossil discoveries, the following report of further progress from Captain CAUTLEY, dated 22d November, was read with much interest:—

“ I am glad to say that Dr. FALCONER's idea of the fossil remains of the larger class of animals, existing in the lower range of mountains, has at length been most satisfactorily realized!! Lieut. BAKER in a late visit to a pass near the Jumna, opposite the village of Rayawalla on the *west* bank of the river, found a fragment of what appeared to me the leg bone of an elephant, but the specimen was small and much worn by weather. I crossed the river some days afterwards, and in company with Lieuts. BAKER and DURAND, took a careful examination of the ravine and slip near which the fragment had been found. We brought away with us a number of fossil bones, two of which were beautifully perfect; one of a leg bone of an elephant, and the other of some large animal, perhaps a camel. I write, however, in perfect ignorance of any classification, having no books of reference, and having been disappointed in my endeavours to obtain CUVIER's *Ossemens fossiles*. These fossils are found in the upper sandstone strata, in the stratum apparently superior to all the others, inclined at the angle which is usual in these hills, viz. from 20 to 35° to the horizon. Since my return to this place, I hear from Lt. BAKER, that a party of work people sent by him to the Ambwalla and Tetrahindi passes, opposite Rayawalla, has returned, laden with similar fossils.

I must also tell you that in the same pass, viz. the Ambwalla, in which the first large fossil was found, Lieut. BAKER discovered some thin strata of blue clay or marle full of fresh water shells, amongst which I recognise a variety of *Helix*, *Planorbis*, and an univalve; the shells are in texture and appearance similar to those found in the kankars of the plains, but very fragile and much broken. There appear to be two strata, each of about 12 inches thick, separated by the sandstone rock. The upper stratum has a superincumbent mass of sandstone of from 60 to 80 feet thick, the inclination may be about 35° to the horizon. In these interesting discoveries now going on, we have already got possession (I imagine) of *three* distinct fossil deposits, and in all probability three as distinct æras.

The 1st or lowest being that with the lignite; consisting of a clay conglomerate or coarse marle, full of remains highly impregnated with hydrate of iron, the leading ones being Saurian and Chelonian, but abounding in bones and teeth of Mammalia, fishes teeth and vertebra, and some few shells; but the latter very imperfect and much broken, probably fresh water from their thinness.

2nd.—The blue marle or clay filled with the fresh water shells above-mentioned.

3rd.—The upper or grand deposit of the remains of the larger Mammalia now found by Lieut. BAKER, their remains being perfectly fossilized, and existing in abundance in the superior strata of sandstone; the general inclination of all these strata varying from 20 to 35° to the horizon.

“ Nov. 25th. The parties detached to Sumrota near the Pinjore Valley, and another spot near Nahun, have brought back a great number of fossils, remains of the larger mammalia. We await your answer to decide on measures for providing the Society with specimens, unless there be objection to *separating* a collection, which will undoubtedly be of the most extensive description; for by keeping them together, there will be a greater chance of a final classification. Ignorant as I am in fossil osteology, I cannot even propose the animals to which our enormous bones belong: the teeth alone prove some of them to be *elephants*'. My friend Lt. BAKER has sent you a drawing of the tooth given to him by the Nahun Rájá. —I have now a similar one brought from Sumrota—and what is rather provoking, a splendid specimen of a head, or as the Chaprassi terms it a '*Deo ka Sir*,' which was found, was carried off by a hill man of the party, who absconded, and bore off the head in triumph to the Nahun Rájá. This head has been applied for; but as it is called a *Deo ka Sir*, the Rájá may perhaps not be inclined to give it up.—There is no doubt of our finding many more, as the fossils are in abundance: all those as yet found are *Westward of the Jumna*.—I have one party in the Sewálik line, eastward of that river, on the search, and when the jungle gets burned a month hence, will have other parties in all directions.

“ I have just received a letter from Lieut. BAKER, mentioning *three* other places where these huge fossil bones have been found; in fact, proving that from the Jumna to the Pinjore Valley, these mountains abound in them.—I hope ere long to report on the Sewáliks, or the line between the Jumna and Ganges.”

Lieut. J. S. NEWBOLD transmitted a Memoir on the Naning territory in the Malay Peninsula, drawn up from memoranda made during a six months residence in its jungles, in 1832. The author proposes also to favor the Society with his notes made on various occasions of visits to the independent chiefs of the interior of Malacca, till lately feudatory to the decayed Malay empire of Menangcobowe in Sumatra.

Read a letter from Sergeant DEAN, stating that he had despatched for the Society, a further assortment of the Jumna fossil bones, and promising a series of specimens of the Volcanic minerals from the neighbourhood of Samur lake.

Specimens of the land shells of Chili were presented by M. DURAND.

Two bottles of water from the hot springs in the Mahadeo hills, and a fragment of stalactite (at first supposed to have been fossil wood) from the cave of the same name, were received from Dr. G. G. SPILSBURY.

### VIII.—Miscellaneous.

#### 1.—Influence of Colour on the Absorption and Exhalation of Odorous Principles.

The *Philosophical Transactions*, for 1833, contains an account of Dr. STARK'S very curious experiments on this novel subject. He had observed that when wearing a dark coloured dress he always brought away from the dissecting room an intolerable smell, which was never remarked to the same extent in light-coloured clothes. This circumstance led him to examine the subject much after the simple and successful plan of Doctor WELL'S experiments on dew and radiation: and indeed the results follow precisely in the same order, and shew an analogy between light, heat, and odour, in their reception and discharge by coloured substances, which may hereafter furnish an argument for the materiality of the two former.

Equal weights of black, blue, green, red, yellow, and white wool, cotton, and silk were severally and collectively exposed to an atmosphere of asafoetida, or of camphor, and were invariably found to the sense impregnated with odour in the order set down: as however no perceptible gain of weight was acquired, it was desirable to devise some means of confirming the evidence of smell.

For this purpose, a vessel of tin was prepared, in the upper part of which the several substances were freely suspended, while camphor was gently heated and volatilized from an iron plate below. Pieces of card of the same weight and size, and painted of the colours mentioned, were also employed, and the results were very uniform; thus, the gain of weight in several experiments was as follows, on an original weight of 10 grains.

	Exp. 1.	Exp. 2.	Exp. 3.	Exp. 4.	Exp. 5.
Black gained	0. 3 gr.	1. 2 gr.	—gr.	1. 0 gr.	0. 9 gr.
Dark blue	—	1. 2	—	—	0. 8
Red	0, 2	1. 0	1. 0	0, 9	—
Green	0. 25	1. 0	—	—	—
Brown	—	—	0. 9	0. 7	0. 4
Yellow	—	—	0, 5	0. 5	0. 3
White	0. 1	0. 7	0. 02	0. 4	0. 1

In all these experiments the black attracted most, the blue next; then followed the red and green; and after these the yellow and white. Dr. STARK next directed his attention to the comparative attraction of animal and vegetable substances, the results of which may be thus summed up:

	Exp. 1.	Exp. 2.	Exp. 3.	Exp. 4.
Silk gained	3,5 gr.	1,4 gr.	0,2 gr.	1,9 gr.
Wool	2,4	0,5	0,1	1,5
Cotton	2,2	0,4	0,05	1,0
	—	—	—	0,4

Every one must have remarked, that silk dresses imbibe a powerful odour, from which cotton ones are comparatively free:—woollen cloth appears to be intermediate. The intensity of the smell however must evidently depend on the celerity with which adours are *given out*, not imbibed: to this third point therefore the author gave his last attention, and it was satisfactory to find that the *radiation*, if it may be so termed, of odours obeyed exactly the same law as its absorption. Thus, the sets of cards, after having been exposed as above to the vapour of camphor and weighed, were left in an open apartment for 24 hours; the losses sustained were in the following ratio.

	Exp. 1.		Experiment 2.		
Black lost	1,0				
Dark-blue	1,0	0,9	remained af- ter 24 hours	0,03	whence the loss in equal times was
Dark-brown	0,9	0,8		0,1.	0,70
Orange red	0,8	0,6		0,2.	0,40
Yellow	—	0,5		0,1,	0,40
White	0,5..	0,4		0,3.	0,10

The practical conclusions to be derived from this valuable train of observations are numerous. The use of airing clothes and linen:—the advantages of wearing light-coloured and especially white dresses in all countries where contagion is rife;—the danger of close assemblies of sombre costumes; such as courts of justice, funerals, &c.:—the advantages of white-washing walls; are all too palpable to need comment. Dr. STARK gives instances of the baneful effect of black dress in absorbing the hurtful emanations of fever patients in a public hospital: and he cites the sessions of Oxford in 1577, where the smell of the jail imbibed from the numerous prisoners caused the death of the judges and several of the black-robed counsellors. At the Old Bailey, in 1750, four judges, three or four counsel, the under sheriff, several of the jury, in all forty persons were attacked and died of jail fever, imbibed in a similar way. May it not be from an experience of the unfitness of dark dresses for hot climates that they are so seldom seen among the natives, and may not their healthiness and freedom from plague be attributable in part to this cause, as well as to the cleanliness wisely prescribed by their lawgivers? Certainly it would be highly agreeable to the temperament of Europeans in this country were some wholesome regulation promulgated, dispensing with sable habiliments under all circumstances. The offensive odour they exhale, as well as imbibe—the impossibility of washing them—their imparting a stain to other clothes, and to the body, when in a state of moisture, render them disagreeable alike to the spectator and to the wearer. The disciples of Hygeia in this country have long since lain aside their European livery, and there seems no reason why the other twain of the “three black sisters, law, physic, and divinity,” should not extend the same indulgence to their votaries of the cloth and of the gown, whose occupations peculiarly expose them to the pernicious influences of bad air and crowded assemblies.

#### 2.—Chinese Method of making Gongs and Cymbals.

[Extracted from the Chinese Encyclopedia called *Tian-kong-kai-we*, by STANISLAS JULIEN. *Annales de Chimie*, Nov. 1833.]

Copper, for musical instruments, must be alloyed with pure mountain tin, perfectly devoid of lead. The proportion for gongs\* (*lo*) is eight lbs. of copper and two

\* The French word is *tam-tam*, but in India we understand by that expression a native drum.—ED.

lbs. of tin. For small bells and cymbals, the two metals must be purer than for gongs.

The gong must not be cast of the necessary form, and afterwards forged under the hammer: but first a thick disc must be cast, then cut round and forged. If large, the instrument must be laid on the ground, and four or five workmen employed to hammer it. By degrees it spreads and rises on the edges, when it begins to give out sounds like those of a musical cord from the points struck by the cold hammers.

In the centre of the plate a boss or knob is left, on which the blow is to be given:—two sorts of sound are recognised, the male and female, depending on the form and projection of the boss.

On doubling the blows of the hammer, the instrument gives out a grave tone.\*

To this unsatisfactory extract M. DARCEY has appended a note, of which the following is the purport.

The analysis of seven *tam-tams* and 22 Chinese cymbals confirmed the composition stated of 80 copper + 20 tin\*: it contains no bismuth. This compound metal is well known to be as brittle as glass, and far from submitting to the hammer after being cast it would hardly bear the blow of a striker. Moreover it is more brittle when heated, and may then be pulverised. This alloy is also dense, the fracture a fine grain like bell-metal, whereas the gongs and cymbals are of less specific gravity, a fibrous structure, and a colour similar to that of an alloy of 90 C. + 10 T, or gun metal: they may be hammered out and bent with ease.

It is evident, therefore, that there must be some secret in the fabrication of these instruments, and this M. DARCEY supposes to be the mode of tempering. In fact he finds that the alloy in question raised to a cherry-red heat, and then plunged into cold water, assumes all the properties of the *tam-tam* and cymbal metal:—This skilful chemist has constructed more than 60 pair of cymbals thus, and always found the simple expedient successful. The Chinese account is entirely silent as to any such treatment of the alloy.

After tempering, however, the alloy is still much too brittle to be worked under the hammer:—the Chinese workmen must therefore have deceived the author of the article; and the translator is also at fault in supposing that it is more easily forged hot.

The method followed in China is thus conjectured by M. DARCEY: An exact model of the instrument required in lead or pewter is first made†, over which a mould of sand or clay is made. The alloy is fused, cast into an ingot, remelted and cast into the mould‡.

The cast is then dressed (*ébarbée*) and tempered like steel. The tone may be regulated by the higher or lower temper given, or by gentle blows over the surface to shape and finish it. France now rivals China in the excellence of her cymbals and *tam-tams*.

\* This is also the composition of the Japanese mirrors. See *Journal As. Soc.* vol. i. p. 243.—ED.

† This is a very common practice in India.—ED.

‡ Probably the Indian mode of attaching the mould to the top of the crucible is followed, as by this means it is warmed and receives the metal freely.—ED.

IX.—Catalogue of Birds (systematically arranged) of the Rasorial, Grallatorial, and Natatorial Orders, observed in the Dukhun by Lieut.-Colonel W. H. SYKES, Bombay Army, F. L. S., F. Z. S., &c. &c.

[Continued from p. 543.]

ORDER III. RASORES, III.

Fam. Columbidae, Leach.—Genus *Ptilinopus*, Swains.

138. *PTILINOPUS ELPHINSTONII*. *Ptil. supra fusco-brunneus; corpore infra, capite, coloco cinereis; cervice nigro, plumis ad apices guttâ albâ nolatis; interscapulio rubineo; collo pectoreque smaragdino, uropygio cinereo, nitentibus; remigum 2dæ, 3tæ, 4tæ et 5tæ pogoniis externis excavatis.*

*Irides ochraceo-flavæ. Longitudo corporis 10.3 unc., caudæ 5.5.*

This very fine bird, forming a link between the Pigeons proper and *Vinago*, has quite the figure and air of *Ptilinopus porphyreus*, figured in Stephens, vol. 14. (*Columba porphyrea*, REINW., TEMM., Pl. Col. 106;) but is much larger: it is a rare bird in Dukhun, and met with only in the dense woods of the Ghauts. Not gregarious. Stony fruit found in the stomach. Sexes alike. Flight very rapid. The lateral skin of the toes is very much developed.

Genus *Columba*, Auct. Pigeon.

139. *COLUMBA MEENA*. *Col. capite, collo, interscapulio, gastræoque saturatè vinaceis, ventre dilutiore; crisso, caudæque tegminibus inferioribus apiceque albis; tergo uropygioque ardosiaceis; tegminibus caudæ superioribus ad apices vinaceis; scapularibus alarumque tegminibus nigris, castaneo latè marginatis; remigibus caudæque fusco-brunneis, illis castaneo marginatis; tegminibus alarum inferioribus cinereis; collo utrinque nigro maculato, plumis cærulescenti-albido ad apices marginatis.*

*Fœm. Crisso dilutè vinaceo; tegminibus caudæ inferioribus pallidè cinereis; rectricibus 4 intermediis albo haud terminatis.*

*Irides aurantiacæ. Rostrum pedesque flavescentes. Longitudo corporis 8 unc. caudæ 5.2.*

*Brown and Chestnut Dove. Hhulgah of the Mahrattas.*

This species might be mistaken for the European *Col. Turtur*, but on comparison, is found to differ in the whole head, neck, shoulders, breast, and belly, being richer vinaceous; in the back and rump being ash, and vent and under tail-coverts in the female light cinereous; in the four upper tail-feathers in the female being red brown without white tips; in the upper tail-coverts being tipped with faint chestnut; in the forehead and chin not being dull white; in orange *irides* instead of yellow; and finally in its greater size. Gregarious. Found only in the woods of the Ghauts. Webs of 2nd and 3rd quills narrowed as in the *Ptilinopus*.

140. *Columba tigrina*, Temm., Fig. Pl. 43. *Surat Turtle.*

M. TEMMINCK's figure does not sufficiently develop the dove-coloured or ochrey tips to the feathers of the back and wing-coverts, and the tips of the centre feathers of the tail are coloured reddish instead of being white. A remarkable feature in this bird is unnoticed in the description of it, namely, the elongated and subulated tail; unlike the last or most other species of *Dove*, instead of widening towards the tip, it is widest at the base when closed, and gradually narrows to the extremity; in fact, each feather is subulate. *Irides* lake colour or pinkish red. Sexes exactly alike. Found on the skirts of the woods in the Ghauts. Length, inclusive of tail, 12 inches: tail, 5 inches.

141. *Columba humilis*, Temm., Pl. Col. 258 et 259. *Columbe terrestre.*

M. TEMMINCK says that this bird "vit habituellement à terre," but from long observation, Colonel SYKES can testify that this supposed habit is no more characteristic of this species than of any other *Dove* in his possession. Gregarious. Not an inhabitant of the woods, but affecting mango-tree groves in the neighbourhood of cultivation. Length, inclusive of tail, 9.4 inches; tail 3.4. Tail, as in the last species, narrower at the extremity than at the base when closed.

142. *Columba risoria*, Linn. *La Tourterelle à collier du Sénégal*, Buff. Ois. 2, 550 and 553. pl. 26. Pl. Enl. 161 & 244. Le Vail., Ois, d'Afr. 6. pl. 268.

Length, inclusive of tail, 13.5 inches: tail 5 inches. Gregarious, and common in the open country. Sexes alike. In spite of the proverbial gentleness of the Dove, Colonel SYKES has seen these birds fighting with the most inveterate hostility; seizing each other by the bill, and rolling upon the ground together. Outer webs of 2nd, 3rd, and 4th quillfeathers hollowed.

143. *Columba Cambayensis*, Lath. Ind. Orn. 2. sp. 56. Temm., Fig. pl. 45.

Colonel SYKES's bird is identical with the species figured in M. TEMMINCK's plate, but it does not correspond with the description of the *Col. Cambayensis* of SHAW, vol. ii. p. 79. This species is distinguished from all other *Doves* with which



Colonel SYKES has met, by the square red spots on the black patches on the side of the neck. Sexes alike. Frequents gardens and stable-yards. Length, inclusive of tail, 11.8 inches : tail 5.5 inches.

144. *Columba Œnas*, Linn. *Stock Pigeon*. *Parwa* of the Mahrattas.

The most common bird in the Dukhun, congregating in flocks of scores, and a constant inhabitant of every old dilapidated building. Colonel SYKES saw the same species on board ship on the voyage to England, brought from China. Irides, orange. Sexes alike. Length, inclusive of tail, 14.3 inches : tail 4.3 inches.

The Dukhun bird differs from the European species in the bill being black instead of pale red, in the utter want of white or black in the quills, the want of white in the tail-feathers, and in the legs being brown instead of black. As these differences are permanent, they might justify a specific name being applied to the *Dukhun Pigeon*.

Fam. *Phasianidæ*, Vigors.—Genus *Meleagris*, Linn. *Turkey*.

145. *Meleagris Gallopavo*, Linn.

The *Turkey* is met with only in the domestic state : it is reared in great numbers by the Portuguese.

Genus *Pavo*, Auct.

146. *Pavo cristatus*, Linn. *Pea-fowl*. *Mohr* of the Mahrattas.

The wild *Pea-fowl* is abundant in the dense woods of the Ghauts : it is readily domesticated, and many Hindoo temples in the Dukhun have considerable flocks of them. On a comparison with the bird as domesticated in Europe, the latter is found, both male and female, to be absolutely identical with the wild bird of India. Irides, intense red brown.

Genus *Gallus*, Briss.

147. *Gallus giganteus*, Temm., Gall. Ind. 633.

Known by the name of the *Kulm Cock* by Europeans in India. Met with only as a domestic bird ; and Colonel SYKES has reason to believe that it is not a native of India, but has been introduced by the Mussulmans from Sumatra or Java. The iris of the real game bird should be whitish, or straw-yellow. Colonel Sykes landed two cocks and a hen in England in June, 1831 : they bore the winter well. The hen laid freely, and has reared two broods of chickens. The cock has not the shrill clear pipe of the domestic bird, and his scale of notes appears more limited. A cock in the possession of Colonel SYKES stood 26 inches high to the crown of the head, but they attain a greater height. Length from the tip of the bill to the insertion of the tail 23 inches. Hen, one third smaller than the male. SHAW very justly describes the habit of the cock, of resting, when tired, on the first joint of the leg.

148. *Gallus Sonneratii*, Temm. Gall. Ind. 659. *Jungle Cock*. *Rahn Komrah* of the Mahrattas.

Very abundant in the woods of the western Ghauts, where there are either two species or two very strongly marked varieties: In the valleys at 2000 feet above the sea, *Sonnerat's* species is found, slender, standing high on the legs, and with the yellow cartilaginous spots on the feathers even in the female. In the belts of wood on the sides of the mountains, at 4000 feet above the sea, there is a short-legged variety ; the male has a great deal of red in his plumage, which *Sonnerat's* has not ; the female is of a reddish brown colour, and is without cartilaginous spots at all : in fact, the female of this variety is the *Gall. Stanleyii* of Mr. GRAY'S 'Illustrations.' Eggs exactly like those of the domestic fowl in form and colour, but less in size. The wild hen would appear to sit on a much smaller number of eggs than the domestic, as Colonel SYKES shot a hen upon her nest in which were only three eggs, and the process of incubation had evidently commenced some days. In the craw and stomach of many birds nothing whatever was found, excepting the seeds of a stone-like hardness called *Job's tears* (*Coix barbata*.) Irides, brownish deep orange. The crow or call of this species is like that of the *Bantam Cock*.

149. *Gallus domesticus*, Ray. *Phasianus Gallus cristatus*, Linn.

The *domestic fowl* is so abundant in the Dukhun, that in parts of the country not much frequented by Europeans, Colonel SYKES has bought from eight to twelve full-grown fowls for two shillings. Many of the hens, particularly of the villages in the Ghauts, are not to be distinguished from the wild bird ; excepting only in the want of the cartilaginous spot on the wing-coverts.

150. *Gallus Morio*, Temm., Gall. Ind. 660. Briss., Orn. 1. 174.

This supposed species very frequently occurs accidentally in the Dukhun. Although unsightly, the black fowl is very sweet eating.

151. *Gallus crispus*, Temm., Gall. Ind. 661. Briss. Orn. 1. 173. pl. 17.

Occurs accidentally like the last variety.

Genus *Numida*, Linn. *Pinlado*.152. *Numida Meleagris*, Linn. *Guinea Fowl*.

Met with only in the domestic state, and bred almost exclusively by European gentlemen. Thrives as well as in its native country.

Fam. *Tetraonidæ*, Leach.—Genus *Coturnix*, Cuv.

153. *Coturnix dactylisonans*, Temm., Gall. Ind. 740. *Tetrao Coturnix*, Linn., Syst. Nat. 1. 278, 20. *Lohah* of the Mahrattas. *Large Grey Quail*.

Rare in the Dukhun, and found only in pairs in tufts of grass near water-courses and ponds. Resembles the *Quail* of Europe in size and plumage: the *irides* are dusky red or reddish brown, like those of the European bird, which by mistake are described in SHAW as yellow. Female a little larger than male: one female measured 8 inches, inclusive of tail of 2 inches, but this was a large bird. Period of incubation in the monsoon.

154. *Coturnix textilis*, Steph., 11. 365. *Perdix textilis*, Temm., Pl. 35. *Perdix Comandelicæ*, Lath., Ind. Orn. 2. 654. 38. *Black speckled-breasted Quail*.

*Irides*, dusky red. Length 6.1 inches, inclusive of tail of 1.5 inch. In pairs in the monsoon; gregarious the rest of the year. Very abundant in *Jowaree* fields, (*Andropogon Sorghum*.)

155. COTURNIX ARGOONDAH. *Cot. supra rufescenti-brunnea, fasciis angustis dilutè ferrugineis notata; infra sordidè alba, fasciis equidistantibus nigris; fronte mentoque ferrugineis; strigâ superciliari rufescenti-albidâ.*

Fœm. *Fasciis magis obscuris.*

*Irides* fusco-rubrae. *Rostrum* nigrum. *Longitudo corporis* 5 unc., *caudæ* 1.5.

Always gregarious; frequenting only rocky places, or amidst low bushes. The covey rises with a startling whirl. Flight very short. Pugnacious, and used by the natives for combat.

156. COTURNIX PENTAH. *Cot. supra saturatè brunnea; infra rufescenti-albidâ nigro fasciata; ventre crissoque albido-ferrugineis; interscapullio scapularibusque nigro maculatis, plumarum rhachibus dilutè flavis; remigibus brunneis pallidè ferrugineo maculatis; strigâ superciliari sordidè albâ; mento rufescente.*

Fœm. *Infra rufescens, haud fasciata; plumarum rhachibus albis.*

*Irides* ochraceo-brunnæ. *Rostrum* rufescenti-brunnæ. *Pedes* flavescentes. *Longitudo corporis* 5.3 unc., *caudæ* 1.7.

Has the habits and somewhat the appearance of the last species, but is found only on the most elevated table-lands and slopes of the mountains, amidst reeds and grass. Colonel SYKES's specimens were shot at 4000 feet above the sea.

157. COTURNIX ERYTHORHYNCHIA. *Cot. supra saturatè brunnea, infra dilutè castanea, nigro (præter ventrem medium) undequaque guttata maculataque, scapularium maculis maximis, pectoris guttis minimis; scapularium tegminumque alarum superiorum albo fasciatarum rhachibus albis, crucem efformantibus; remigum pogniis externis rufescenti fasciatis maculatisque; fronte nigro; strigâ frontali utrinque supra oculum productâ gulâque albis.*

Fœm. *Fronte, strigâ inde ad utrumque latus ductâ, gulâque dilutè castaneis.*

*Irides* obscurè flavo-ochraceæ. *Rostrum* rubrum. *Longitudo corporis* 5 unc., *caudæ* 1.5.

Colonel SYKES has found this very handsome bird only in the valley of Karleh, where it frequents the same ground as the *black Partridge* (*Perdix picta*). Gregarious and abundant. In closing his notices of the *Quails*, Colonel SYKES mentioned that grass seeds constitute their principal food.

Genus *Perdix*, Biss. *Partridge*.

158. *Perdix picta*, Jard. & Selby, Pl. 150.

This is called the *black partridge* in Dukhun, by Europeans. It affects uncultivated tracts in the country, covered with tufts of rank grass and low bushes, where it is abundant. Colonel SYKES has never met with it in gardens. The call of the male is a kind of broken crow. Sexes exactly alike. *Irides*, reddish dark-brown. Length, inclusive of tail, 10 inches: tail 2.5 inches. Does not roost on trees.

Genus *Francolinus*, Steph. *Francolin*.

159. *Francolinus Ponticerianus*, Steph. 11. 321. *Perdix Ponticeriana*, Lath., Ind. Orn. 2. 649. 18. Temm., Pl. Col. 213. *Ferruginous and Grey Francolin*. *Tectur* of the Mahrattas.

Called a partridge in the Dukhun, where it is one of the most common birds, frequenting gardens and cultivated lands. *Irides* intense red brown. Length, inclusive of tail, 14 inches: tail 3.6 inches. Not met with in the Ghauts, unless in well cultivated valleys, and not at all on the mountains. Roosts on trees; and Colonel SYKES has on more than one occasion shot them on trees during the daytime; but this is a rare occurrence.

[To be continued.]

Meteorological Register, kept at the Assay Office, Calcutta, for the Month of November, 1851

Day of the Month.	Barometer reduced to 32° Fahr.				Thermometer in the Air.						Depression of Moist-bulb Thermometer.			Hair Hygrometer.		Rain. Inches.	Wind.			Weather.													
	At 4 A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	Minimum	At 4 A.M.	At 10 A.M.	Max. by Reg. Ther.	At 4 P.M.	At 10 P.M.	At 6 A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.	At 10 A.M.		At 4 P.M.	Morning.	Noon.	Evening.													
																					At 4 A.M.	At 10 A.M.	At 4 P.M.	At 10 P.M.									
1	.934	.934	.926	.926	77.2	80.0	104	82.0	77.4	77.4	3.4	7.8	11.3	4.4	88	78	0	N.	0	0	rain.	clear.	rain.										
2	.916	.900	.908	.908	75.6	79.5	104	82.4	77.2	77.2	2.8	9.1	12.8	4.2	85	75	0	W.	0	0	do	do	do										
3	.936	.907	.936	.936	74.7	80.5	102	81.9	77.2	77.2	1.6	9.3	9.7	2.6	84	83	0	n	0	0	do	do	do										
4	.945	.906	.933	.933	74.5	80.8	103	81.7	78.5	78.5	1.5	7.0	9.9	3.4	89	84	0	n	0	0	do	do	do										
5	.912	.964	.935	.935	73.5	79.4	88.7	81.1	75.6	75.6	1.3	6.1	7.4	2.7	93	87	0	ne	0	0	do	do	do										
6	.886	.970	.906	.906	73.2	77.5	76.8	77.4	72.0	72.0	0.5	4.6	4.5	1.3	98	98	0	ne	0	0	rain.	showers.	rain.										
7	.873	.950	.930	.930	71.3	76.4	9	79.4	75.4	75.4	0.4	4.9	6.4	2.9	96	93	0	nw	0	0	clear.	fine.	clear.										
8	.910	.962	.914	.914	72.2	76.1	9.7	79.7	74.1	74.1	1.7	5.6	9.0	1.4	92	84	0	nw	0	0	do	do	do										
9	.935	.914	.935	.935	72.3	77.1	102	80.3	74.6	74.6	1.2	9.1	11.6	4.0	92	78	0	w	0	0	do	do	do										
10	.949	.911	.919	.919	70.3	76.9	101	80.1	74.3	74.3	2.5	6.3	10.4	3.2	85	80	0	e. n.	0	0	do	do	do										
11	.924	.966	.916	.916	71.5	76.9	101	79.9	74.4	74.4	1.0	8.7	11.9	3.6	85	78	0	ne. w.	0	0	do	do	bright.										
12	.936	.984	.934	.934	70.4	75.4	104.1	80.2	73.2	73.2	2.1	7.9	10.3	3.4	83	80	0	nw	0	0	do	do	hazy.										
13	.963	.910	.940	.940	70.4	75.9	105	79.5	72.0	72.0	2.8	8.8	12.4	2.0	85	75	0	.	0	0	do	do	clear.										
14	.958	.930	.976	.976	68.6	76.3	102	78.7	72.2	72.2	2.9	9.8	11.3	1.6	82	83	0	n	0	0	do	do	bright.										
15	.974	.950	.921	.921	69.4	76.7	101	78.7	73.2	73.2	1.5	8.5	10.2	2.0	86	82	0	w	0	0	do	do	fog.										
16	.908	.986	.904	.904	70.8	76.7	102	78.6	75.0	75.0	1.9	6.7	10.3	2.5	91	82	0	n	0	w.	do	do	cum. cirrus										
17	.909	.978	.932	.932	70.8	76.0	93	78.4	71.3	71.3	1.7	5.9	9.1	1.1	92	85	0	o	0	0	do	do	cum.										
18	.964	.970	.973	.973	70.1	76.0	99.8	79.3	73.2	73.2	2.1	5.9	9.6	1.6	92	84	0	nw	0	0	hazy.	do	do										
19	.912	.962	.974	.974	70.8	76.4	95	79.2	75.0	75.0	2.0	6.9	9.9	2.7	91	85	0	nw	0	0	clear.	do	do										
20	.915	.940	.960	.960	64.2	76.3	101	78.5	72.7	72.7	2.0	8.1	9.9	2.7	86	82	0	nw	0	0	cum. cir.	do	do										
21	.924	.946	.958	.958	69.7	75.5	92.5	78.6	71.2	71.2	2.3	6.7	9.9	1.9	91	85	0	n	0	0	clear.	do	do										
22	.924	.980	.950	.950	69	75.9	100	78.9	73.2	73.2	2.4	6.7	10.2	2.2	93	82	0	n	0	0	cum.	do	do										
23	.946	.954	.992	.992	70	76.5	100	77.5	73.2	73.2	2.3	6.7	10.4	2.0	93	82	0	n	0	0	clear.	do	do										
24	.902	.968	.900	.900	70	74.8	94	77.5	71.5	71.5	2.5	7.3	10.4	3.7	90	81	0	n	0	nw.	do	do	cloudy.										
25	.936	.922	.920	.920	70.6	75.3	97.8	78.1	71.1	71.1	2.6	7.5	11.1	2.0	89	78	0	n	0	nw.	cloudy.	clear.	clear.										
26	.982	.978	.967	.967	68.7	74.8	94	77.6	72.3	72.3	1.7	8.5	10.0	4.3	86	84	0	ne	0	0	do	do	do										
27	.972	.929	.914	.914	67.8	74.3	98.4	77.4	71.1	71.1	2.6	6.4	11.1	7.7	83	80	0	ne	0	0	do	do	do										
28	.932	.914	.900	.900	68.2	74.1	101	77.4	71.2	71.2	3.1	7.7	10.6	4.4	89	79	0	ne	0	0	do	dull.	do										
29	.954	.938	.938	.938	69.8	74.9	95	77.5	71.1	71.1	4.8	7.0	11.1	6.0	89	80	0	ne	0	0	clear.	do	do										
30	.994	.970	.965	.965	65.7	74.5	92	77.0	70.4	70.4	4.3	6.5	11.0	6.4	88	78	0	n	0	0	do	do	clear.										
Mean	.953	.921	.931	.931	71.2	79.2	98.1	79.4	74.1	74.1	2.2	7.5	10.1	3.1	88.7	82.1																	Fine and reasonable.

The instruments and localities as usual. The Barometer has been compared with Captain HENNING'S Marine Barometer from England (which had been adjusted with the Royal Society's Standard instrument,) and found just 0.008 inch lower than the Roy. Soc. Bar. The maximum thermometer is found to be exposed to the sun's rays at this season. On the 5th and 6th there was a severe storm in the Bay, by which the Spheria was damaged.

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I.—*Some Account of the Territory and Inhabitants of Naning, in the Malayan Peninsula. By Lieut. J. T. NEWBOLD, 23rd Regiment, Madras Native Infantry.*

*Topography.*—Naning is an inland territory; its mean length north and south, about forty miles, by an average of ten in breadth, giving 400 square miles. The boundary to the northward was never clearly defined till the 9th of January, 1833, when Mr. WESTERHOUT, the Superintendent of Naning, came up to Sunjie Seepoot, a village near the frontier, to meet the Rumbowe chiefs, with a view of determining the respective boundaries of the two territories.

An agreement was here drawn up, and signed by the Raja MUDA, the Panghulu of Rumbowe, Maharaja LILAH, and the eight Sukes, and by Mr. WESTERHOUT and two witnesses on the part of Government.

The boundary line agreed on, commences at Qualla Sunjie Gernee, thence to Bukit Bertram, thence to Bukit Jelatang to Bukit Puttoos, thence to Jeerat Gunjie, Lubo Talan, Duson Feringie, Duson Kapar, and Coloo Songa, to Bukit Puttoos\*. By this arrangement a spot fertile in tin, and a small access of territory, have been gained to Government.

\* The boundaries of Naning with Johore and Malacca have been fixed, since the writing of this memoir—with the former, the line extends from Bukit Puttoos to Bukit Battang Malacca, and terminates at Mount Ophir. The Malacca line commences at Mount Ophir, and thence taking a south-westerly direction, passes through Rambotan Gading, Battle Bakawat, Bukit Lansat, Bukit Badorie, Bukit Panchoor, Pankalan Sompit, Qualla Sunglepattye, Campong Kodia Pacho, Pondo Sassam, Pondo Panjang, Pondo Battu, Bukit Kaya Arang, Bukit Pembagian, Ramoun Chino Kechil, and Tebbing Tingih. From Tebbing Tingih to Qualla Londoo, the Rumbowe river is the boundary between Naning and Rumbowe to Qualla Surgie Gernee.

This line with part of Johole and Mount Ophir forms the eastern and northern boundary ; to the southward, Naning is bounded by the Malacca and Assahan territory ; on the west by Malacca, and the left branch of the Lingie or Rumbowe river.

The face of the country presents an undulating extent, interspersed with high knolls thickly clothed with jungles ; the hollows, or rather flats between these undulations, where the water lodges in the rainy season, average 70 or 80 yards in width, and either form a swamp or paddy-ground, according to the industry or otherwise of the natives in the vicinity.

The soil on the high grounds is red and gravelly generally ; on the flats, soft and whitish. Pipe-clay is found in some parts, as also a rich black soil.

Naning has only three streams, scarcely to be called rivers—Sungie Rumbowe, Sungie Malacca, and Sungie Londoo ; of these, the Rumbowe stream is much the largest. It enters Naning from Rumbowe near Qualla Maraboo, whence it makes its exit into the Malacca territory, a little below the place where it receives the waters of Sungie Londoo. It is here nearly 16 yards broad, and passable for troops in dry weather. In the rains it is not fordable.

Trees thrown across here and there constitute the only bridges : boats come up, but their supply is precarious.

This and the Lingie river unite below Sempong, a tongue of land belonging to Rumbowe, which is formed by the division of the two streams, about six miles below the north-western extremity of Naning, and nearly midway between it and the sea, where it empties itself, dividing the Malacca and Salengore territories about 24 miles to the northward of Malacca. Up to Sempong its mean breadth is 180 fathoms : soundings at the mouth (high-water and spring-tides) seven and eight fathoms. The tide barely reaches to the Naning territory.

Sungie Londoo is a small stream taking its rise at Bukit Kayu Arang, or the Ebony Hills in the Malacca territory. It enters Naning near Cahow, taking an almost northerly course, and emptying itself into the Rumbowe river below Si Maraboo.

Sungie Malacca is formed of two branches, taking their rise, the one in the hills of Rumbowe, the other near Battang Malacca, in Naning ; they unite near Sabang, taking a westerly direction, and quitting Naning near Sungiepattye, fall into the sea at Malacca, having an embouchure of about 16 yards wide. In the wet season it is navigable for provision and baggage boats to Ching in Malacca, and thence by Malayan canoes (sampan) to Sabang in Naning.

Throughout Naning it is fordable in dry weather, but not in the rains; it is crossed at short distances by the usual Malay rude foot bridges.

Its bed is generally sand and gravel; the banks grassy and sandy; in some parts steep. Besides these streams, there are many small rivulets not worthy of notice.

The native roads are merely foot-paths, cut and cleared constantly by the Malays as they pass along with their Parangs, which a Malay is seldom or never without.

There are vestiges of a road here cut by Colonel FARQUHAR, from Malacca to Sabang in Naning, which it enters near Malacca Sinda; but from neglect it is little better than the native foot-paths.

The Malay roads run over the bunds of the paddy-fields, which frequently break down, leaving a deep puddle, over which they throw a bamboo or two as a bridge; their streams and rivulets boast of nothing better than a couple of trees felled carelessly across their course, with sometimes a slight bamboo as a hand-rail.

These paths if little travelled on by the Malays are liable to serious obstruction, particularly in a military point of view, from the numerous forest trees blown down by the wind, or falling through the decay of age.

I have seen in a remote part of this country, the path as effectually barricaded by this accidental obstruction, as if a body of Malays had been at work to cut off our communications.

A military road of communication between Taboo (the wretched capital of ABDUL SYED, situated nearly on the frontier of Naning), was opened during the operations in 1832, following in parts the old Malay foot-path. It enters Naning at Sungiepattye, passes through Alor Gajah (now FORT SISMORE, our chief military post), over the shoulder of the hill of Bukit sa Booseh to Taboo, where it terminates about three and a half miles from "Kubur Feringie," (the ancient tomb of a Portuguese in the jungle,) on the Rumbowe frontier, to which territory a path through a dense forest leads.

The Taboo road was constructed on excellent principles, for the service for which it was intended; a thick and lofty forest has been cleared to the extent of from 70 to 100 paces on either side, precluding the possibility of trees falling or being felled across. The low underwood in the intermediate space was burnt so as to afford the lurking Malay no shelter. Brushwood and branches of trees, secured on either side, by strong piles, and layers of gravel thrown over the whole, enable the guns and provision carts to pass with ease the numerous Sawahs and marshes.

From the Naning road, at its entrance into the Naning territory at Sungiepattye, branches another nearly due west, leading to Sungie Baru, a cultivated district, distant about nine miles. This has been constructed since the cessation of hostilities. Another road to Sabang, (one of the most populous places in Naning, and a military post, about four miles from Alor Gajah,) branches off in an easterly direction. From Sabang there is a bullock road to Taboong, the most easterly of the Naning outposts, eight miles distant from Sabang; also a bandy road to Taboo, which joins the road from Alor Gajah, shortly after entering the Taboo lines. From Sabang are also roads to the outpost of Qualla Fena and Pellowe, three or four miles distance from thence.

Water is plentiful, and may easily be got, two or three feet below the surface, on the slope of the rising grounds. It is often of an acidulous mineral taste, but is not accounted unhealthy by Europeans.

There is a hot sulphurous mineral spring near Sabang, the water of which is esteemed by the Malays as very beneficial in cutaneous diseases. I have rarely passed without seeing some diseased native laving his contaminated person in the steaming liquid. There is also a hot-spring in the jungle near Taboo: the natives say that the temperature of this is much greater than that of the Sabang spring. I have not been able to discover that a volcano has ever existed in Naning, nor are there any volcanic remains visible.

A small portion of gold is, I understand, to be found in Naning, and tin in considerable quantities; but it wants a more industrious and energetic population to turn these advantages to account. Mr. WESTERHOUT, Superintendent of Naning, has established a tin mine at Londie, about two and a quarter miles from Taboo; of the produce of which and the ore I possess very favorable specimens. The charcoal used by the Malays for roasting and smelting the ore is that of the Compas and Kamounin wood. The following is a translation of the simple Malaymining process, given me by a Malay miner:—"Excavate the ground to the depth of a man; if there be ore, you will find it like small dark stones; then make a channel to drain off the water. This done, construct a furnace, like the one used in burning lime, with a funnel beneath, to allow the fused metal to escape: heap it with the ore and Compas or Kamounin charcoal, set fire to and blow it, and the metal is produced." Straits tin is now selling at  $13\frac{1}{2}$  dollars to  $14\frac{3}{4}$ , and Banca, from 15 to  $15\frac{1}{2}$ , per picul. The natives' mines are very superficial, seldom more than from six to twelve feet deep, and as many in length and width. The process will be more fully described hereafter.

*Produce and Trade.*—The chief produce of Naning is rice, timber, and fruits; of the former, the produce averages 70 gantams to one

sown. There is one crop a year. The inhabitants carry on a trade with Malacca, in timber for house-building, and in fruit; the rice is generally used in home consumption.

Gambier, ratans, 21 varieties of Kaladi, jaggery, dammer, together with a small quantity of pepper, pân and betel, marabow, compas, ebony, and kamounin wood, with wood-oil, and a little inferior coffee are likewise found; pepper and gambier were much more cultivated than at present, the diminution is to be ascribed to the present low prices these two articles bear in the market.

Pepper to pay well ought to fetch seven dollars per picul, the price now varies between five and six. Gambier sells at 3 and  $3\frac{1}{2}$  dollars; it has been stated that Nanning produces annually three hundred piculs of tin, sixteen thousand gantams of paddy, and a quantity of coir-ropes,

Sago, Nibang, Ranjow, Areca, and Jack trees are plentiful.

I possess lists of ten different varieties of cocoanut trees, of which the "Klapa Logie," a sweet cocoanut, is most esteemed.

Also thirty-nine varieties of plantain, of which the "Pisang Berangan" and "Pisang Raja" are the best; the odoriferous Dorian is accounted by Malays the first fruit in the world. There are two or three varieties of it in Nanning, of which the "Dorian Tambago," and the "Kapatah Gajah," or the "Elephant's Head," are held the greatest delicacies. The Mangis or Mangosteen grows in Nanning, an excellent fruit, of which I do not hear that there is more than one variety; Pine-apple, Rambotan, (two varieties) the Duku, the Fampony, the Sangoeh, (three varieties,) the Dalimah, and about fifty others, of which I have lists, as well as most of the jungle trees, with the native mode of cultivation, which for the sake of brevity are omitted.

There are forty-five species of trees in the jungle, of which the fruit is edible, and of which the Nanningites availed themselves during the late disturbances. There are fourteen varieties of oranges and lemons, and sixteen varieties of yam, and twenty three of culinary vegetables.

Nanning produces most of the animals to be met with on the Malay Peninsula; amongst the principal of which are the elephant, rhinoceros, and tapir, (rare) a variety of tigers, tiger cats, leopards, monkeys, bears, aligators, and guianas, and an endless variety of birds—the Argus pheasant, the peacock pheasant, rhinoceros-hornbill, humming birds, and a large vampyre bat called the Kaluwang. Snipes are common; but the hare and common partridge are not to be met with. There are a great variety of snakes, and one or two of deer; two varieties exceedingly minute, termed by the Malays the "Plandok" and Napu, the flesh of which is dried and eaten.



The Malays in Naning do not cultivate more rice than is absolutely necessary for their private wants, and the portion annually given up to the Panghulu: this is generally cut in February and March. The principal grain districts are Sabang and Malikie. The Panghulu depended on these places in a good measure for his supplies. Fire-arms and gun-powder are scarce.

Carriage is got with difficulty and expense in Naning. Coolies are the best means of transporting baggage.

The Malays are despicable as an enemy in open ground, or at close quarters, (except the rare Amok,) seldom or never trusting their persons from the protection of a breast-work or trees; when they retreat, they plant Rangows (a sort of wooden caltrop) in their rear. During a war which lasted two months, behind breast-works, between the chief of Rumbowc and a confederacy of minor chiefs against him, after a large expenditure of powder and a disastrous list of bur-ten Lilahs, the bills of mortality actually amounted to two casualties. In short, their plan is one of incessantly harassing the line of communication, stockading and retreating: the best, in fact, they could adopt in a country covered with forest, and where every tree is a strong-hold, and every road a defile.

Taboo is the only decidedly unhealthy post to Europeans; of the officers who remained there, any length of time, one alone escaped fever.

It is situated, not low, but surrounded by lofty hills, covered with jungle, which, perhaps by impeding the free circulation of air, may contribute to its character for unhealthiness; which it also bears from the natives themselves.

The climate of the interior is not favorable to the long occupation of the country by Indian troops; at all events they would require frequent reliefs. Fever and an obstinate ulcer attacking the legs, are their principal enemies; a slight scratch without attention being difficult to heal.

The ulcer attacks the Malays also; they call it *توقق tokah*; they also have a species of leprosy called *كست kusta*, and a disease, like cholera, called *انگين طاعون angin táawan*, or the "Wind of Pestilence:" both of these last are deemed incurable in Naning, and the unfortunate sufferer is generally deserted by his friends in his greatest need, or driven into the jungle to perish, as an outcast. Katumbohan *كتمبوھان* or small-pox, is prevalent. I have not heard that inoculation or vaccination, is known to the natives; at all events, it is not practised; they use refrigerating medicines.

*Population and Revenue.*—The census of 1829, gives the population of Nanning at 3,458 souls, of whom 1,800 are capable of bearing arms, and 911 houses. The revenue is derived from its produce, and has been estimated before the war at 3,000 dollars per annum;—this is probably above the average.

The Panghulu levied an annual tribute, formerly, from every house of five gantams of rice, and two fowls, and two cocoanuts\*.

The principal villages are those of Sabang, Taboo, Chirara Pootih, Malikie, Battang, Malacca, Sungie Secpoot, and Brissoo Sabang, with the small campongs around, contain 148 houses; they present similar features to other Malay villages; the houses are situated near the edges of paddy fields, and invisible at a distance from the number of cocoanut and other fruit trees, by which, as well as a Paggah fence, they are usually surrounded; they are straggling, and one village runs into another, in a manner from which it is impossible for a mere observer to know where the one ends, and the other commences.

Taboo, the chief village and former place of residence of the expanghulu of Nanning, lies about seven miles from our principal post, Alor Gajah, through an undulating country of jungly hills and uncultivated rice-grounds.

About two and a half miles from camp (Alor Gajah), crowning a small eminence, seventy yards to the left of the road, stood the stockade of Bukit Sabooseh, taken by Captain POULTON'S detachment on the 25th May, 1832. This position commanded the Taboo river.

Below this hill, on the Taboo side, lies the village of Malikie, to which the expedition in 1831 penetrated. Farther on, about a mile, in a commanding position on the road, which gradually ascends to it, stood the stockade of Bukit Perling; thence towards Taboo, the descent of the hill is very steep, and as usual, terminates at the foot, in an uncultivated swampy rice-ground.

Perling was decidedly the strongest military position taken up by the enemy, and in some measure deserved the name "The Key of Taboo," bestowed on it, by the Panghulu.

From this up to the Taboo lines, the country on the left bears traces of a better cultivation, and a once numerous population.

The Taboo lines consist of a long mud wall, about eight feet high, and three or four thick, rivetted by stakes and branches of trees laid parallel to each other; this wall runs across the rice-grounds in the front, on the edges of the raised ground, on which grows a thick cocoanut tope, forming the rear, and containing a burial-ground, with several deserted houses; the lines are 840 feet long. There is a bastion-

\* He also possessed the privileges of Hu Dendin, Pengutan, and Kapala Ayer.

like projection in the centre, the idea of which does the Malayan "Vauban" credit.

The left of the lines terminates in an epaulment, flanked by a steep hill, whilst the right terminates with the tope in a deep swampy rice-ground. The rice-ground in front is traversed by a small rivulet, and flanked by jungle, in which were three small stockades; and on the left by steep wooded hills, on the bottom of which, near the edge of the rice-ground, runs the Alor Gajah road.

In front of the left of the lines rises Bukit Penialangan, or execution hill, (so called from the ex-panghulu's selecting this as his "place de grève,") commanding the lines from right to left: some distance in rear of the burial ground is a mosque, and the building where the *تابوه* Taboh or great drum, whence the place derives its name, was placed. The Taboh itself has been displaced, and now lies broken on the ground. The sacred baths of the ex-Panghulu, little sheds, are near this. Here the superstitious Malays were wont to seek a remedy for their maladies from the holy-water into which the sacred foot of the Panghulu had been dipped.

The house of the Panghulu was situated in the midst of an almost insulated cocoanut tope, and surrounded by a high stockade of bamboo, with an imperfect mud breast-work. It has been pulled down by order of Government, partly, I understand, to do away with any superstitious idea entertained by the natives of the Panghulu's future return to it, from the circumstance of its remaining standing.

The village of Taboo itself is a small collection of Malay houses, not amounting to 30, surrounded as usual by topes of fruit trees, and shut in by lofty hills, mostly covered with forest; it is considered unhealthy, as stated before; there are many idle superstitions connected with its environs.





