JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

VOL. XLIX.

PART I. (HISTORY, ANTIQUITIES, &c.)

(Nos. I TO IV.—1880: with 22 Plates and 2 Maps.)

EDITED BY

THE PHILOLOGICAL SECRETARY.

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

CALCUTTA:

PRINTED BY J. W. THOMAS, AT THE BAPTIST MISSION PRESS,

AND PUBLISHED BY THE

ASIATIC SOCIETY, 57, PARK STREET.

1880.

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JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part I.—HISTORY, LITERATURE, &c.

No. I.—1880.

Description of the Great Śiva Temple of Gangai Kondapuram and of some other places in the Trichinopoli District.—

By Lieut.-Col. B. R. Branfill. (With a Plate.)

During the past season I visited and examined the great Śiva temple of Gangaikonḍa (-Shola-)puram (Gangacondapuram of A. S. 79), situate in the extreme E. N. E. part of the Trichinopoly District, 20 miles S. W. from Chidambaram.

As this is the largest* and best specimen of a South Indian temple proper I have ever met with, I venture to offer a short description of it. Roughly speaking it is a facsimile of the great Tanjore Temple, possibly its prototype, or perhaps more probably a copy; but never having been "restored," as the Tanjore example has, and being built throughout in a very hard kind of stone, it retains much of its pristine appearance and purity of design, which has been lost there.

I made notes of my observations on the spot and took measurements, sketches and some impressions of the inscriptions with which its base is covered, as specimens of the character, which is mostly old Tamil, very similar to that at Tanjore.

Gangaikonḍapuram is the site of a deserted town supposed to have been the city or chief town of Gangaikonḍa Chóla.

* The largest Indian sanctuary towers mentioned by Fergusson (Hist. of Arch. Vol. III.) are those of Jagannáth at Puri and the great Tanjore Pagoda, which are 80 and 82 feet square at base respectively.

Most of the inscriptions appeared to be mere statements of gifts made to the temple by private persons. The western and southern (side) inscriptions appeared to be mostly in the Tamil character and language with occasional Sanskrit formulæ to begin and end with. Those on the northern side were said to be chiefly in Grantha and Telugu or other (than Tamil) characters.

The temple consists of a grand stone "stubi" (as they called it), a sanctuary *steeple* or Vimánam on a raised basement or terrace, decorated by a rail ornament below, having the upright posts engraved with griffins (or *Yáli*), and an elaborate scroll-enveloped animal or figure on every third or fourth post, but no cross-bars or horizontal rails between.

The *Állóḍai* or terrace-path is 3½ feet wide, surrounding the entire temple, including the great Veli-mandapam or Outer court, at a height of about 5 feet above the (original) ground level.

The great pyramidal Vimána is 100 feet square* at base and about 165 feet high. The double story below the pyramid and immediately above the terrace basement is vertical, with five compartments or towers on each face (north, west and south) of the temple, separated by four deep recesses, with a handsome sculptured ornament (*puráṇa kumbam*) in each recess. Each projecting compartment has a fine sculptured figure, chiefly Śaiva but not without important Vaishnava figures, and the plain intervals of flat wall are covered with (?) historical scenes of rishis, kings, worshippers and attendants, celestial as well as terrestrial, in low relief.

Above the double vertical story rises the pyramidal *stubi* in seven stories to the neck which is spacious and supports four bulls (as at Tanjore) below the dome or semi-dome.

The whole temple is of stone throughout, and the domed top is apparently carved to represent a copper tile or leaf-pattern covering, like that of the five halls (*sabha*) at Chidambaram.

The only or chief ornament of the pyramidal portion of the tower is the square and oblong cells of "Rath" (= car) or Gópuram (= spire-roofed) pattern, with their elaborate fan-shaped windows, like spread peacocks' tails.

There is little if any stucco to be seen, the whole being of pure stone.

On the east side and attached to the great *stubi* is the Méle-Mandapam (= a high court or west court), a three-storied portico or transept covering the cross aisle between the north and south entrances to the Temple; this is built to match the Vimána, as at Tanjore.

To its east again and attached to it, is the west wall and end of the great Outer court (Veli-mandapam), begun in the same magnificent scale

* See note above.

and style, but never completed: for it is broken down or left off rather abruptly, and finished by a plain large hall, completely enclosed by its four walls and flat roof, only half the height originally designed.

It measures 80 feet wide, North and South, and 163 feet long, West to East, with a plain doorway in the middle of the east end, having huge stone warders (*dwárapál*), but otherwise devoid of any fine ornamentation. It is 18 or 20 feet in height, and the roof is supported by four rows of plain stone pillars.

There is a large uncovered and incomplete portico in front (East) of the Veli-mandapam, approached by a double flight of steps from North and South and 10 or 12 feet above ground level, which is the level of the interior of the mandap and temple.

The court-yard of the temple is about 610 feet East and West, by 350 feet North and South, with a fine gópuram or entrance tower built entirely of stone (fast falling down) on the East, of grand but suitable proportions, not half the height of the temple itself. Usually the gópuram is 8 or 10 times as high as the temple sanctuary.

The court-yard or quadrangle was once surrounded by a double-storied open cloister of plain but solid stone work, said to have contained 365 cells (in the two stories), but only a few of these remain in the centre of the north wall there is a small plain doorway.

The surrounding wall was of stone and must have been about 25 feet high.

The sculptures round the base of the temple are very good in design and execution.

The architecture struck me as grand, simple and pure, with many traces of the wooden construction of which it is, in many respects, a copy; especially in the projecting beam-heads at the angles, each of which is surmounted by a rude lump roughly resembling a flattened spiral (conch-) shell, perhaps intended for the sálagrám (black ammonite or serpent-stone); only this is a Śaiva temple.

I did not notice the Nága, but saw traces of trees with umbrellas over them.

The (proper) right hand Dwárapál has the right foot raised and resting on a stump (of a tree), encircled by a serpent with a half-swallowed elephant in its mouth, at all three doorways alike.

The projecting stone cornice of single convex flexure is massive, but does not stand out so far as in many more modern cases I have noticed elsewhere, but is, I should say, more free and prominent than some to be seen at Chidambaram.

I did not see the imitation of wooden rafters and laths, with nail heads &c., to be seen at Tinnevelly.

The usual Bull (*Nandi*) in front of the temple is a poor one, compared with that at Tanjore.

The minor temples and shrines in the court-yard are inferior and mostly in ruins.

One of the more conspicuous of the sculptures represents Śiva coming out of an opening (*yóni* or split) in a cylindrical stone column (or *lingam*).

This figure is represented at Tanjore and elsewhere, and is to be seen repeated here several times in various parts of the Gangaikonḍa Sholapuram temples.

A figure of a rishi (Márkaṇḍa) on his knees, with forehead on the ground, is below.

The pillars and pilasters are very plain, square in the four towers (or *rath*-like portions), forming the four corners of the *stábi*, ornamented by pointed leaves below the capitals, which are very fine large tabular slabs.

The square pillars or pilasters are not cut away to the octagon form leaving square blocks, as is common. The pillars and pilasters of the next, intermediate, partitions or towers are octagon throughout, with similar lanceolate ornamentation and (octagonal) capitals.

The central partitions or towers have 16-gonal pillars and pilasters with similar ornaments and capitals.

The plinth moulding is very grand, bold and chaste. It re-called to my mind the pattern of the plinth moulding of an unfinished temple at Kuttálam (*Courtallam*) in Tinnevelly.

The flat portions of the walls are covered with (?) historical scenes in which rishis and country folk, herdsmen &c., figure largely.

There are three or four wells in the Temple court, one of which (the Sin(g)ha Tírtham) is connected with the legend of the founding of the temple and possesses a never-failing supply of very good water.

I noticed that the name on the Tamil inscriptions was Gangaikonḍa Sholapuram and Gangaikonḍapuram. The inhabitants now call it Gangaikaṇḍapuram. They told me that the Stalapuráṇa or local historical record of Gangaikonḍapuram had been taken to Tanjore and a copy placed in the Rajah's library there, whilst a copy (or the original) was taken and kept by the copyist who now resides at Nachaiyárkóvil (or at Tirichirai) near Kumbakónam.

Another place of interest I visited may be worth mentioning though quite modern, and that is Rámalinga-pillai-sálai, a remarkable church or college building, called variously *Pardésimaḍam, and Sanmárga-Sabai*, situate on the high road from "Cuddalore" to Vriddháchalam, a mile or

so west of the point where the high road from Madras (viâ Panrutti) to Kumbakónam crosses it.

A few years since, one Rámalingapillai collected followers and money and attempted to establish a new religion. He appears to have taught the ethics of Christianity without its theology. But I could not get at any precise particulars. Having collected some hundreds of followers (2000 was stated) and built his college, Rámalingapillai retired with some ceremony into concealment in a house, now styled "*Tirumâligai*," in the village of Moṭṭukuppam, a few miles distant from the College.

He is said, by his followers who now await his re-appearance at "the last day," to have never come forth from the room in which he disappeared, or to have been seen again.

I think the true facts of the case are worth eliciting and putting on record. The building is a remarkable one of brick and *chunam* in the modern Eurasian composite style, and the domed part of the roof or cupola appears to be covered with sheet metal.

I also visited Chenji or Sanji-Kóṭṭai (Anglice *Gingee*), a remarkable precipitous bluff rock, covered with and surrounded by fortifications of no very ancient date apparently. It is just the kind of stronghold that was likely to be seized on and held as a citadel by the successive conquering armies that have overrun the Carnátik for some centuries past.

The most interesting thing I observed here, beside the natural fastness (a notice of which is to be found in the *South Arcot Gazetteer*), was a very rudely carved stone lying in front of a small shrine halfway up the rock on the south side, dedicated to a local goddess called Kamala-kanni-y-amman to whom human sacrifices were formerly offered. Plate I shows copy of a rough pencil sketch taken hurriedly on the spot. Four human heads occupy a square raised shield, with two parallel bars in the centre like a pair of dumbells with small knobs, which might stand for footprints. Each pair of heads is separated by a *triṣul*-like mark immediately above and below the pair of bars in the centre. Above these in the centre at top is a pair of ram's (?) horns, surmounted by a short transverse bar and appendage which I could not make out, and in the centre below, a corresponding pair of buffalo (? *kulgá*), horns and head. A bow to the right and five arrows to the left on the lower part of the stone, at each side of the raised part, complete the carving. The arrows are club-headed and feathered, and one of them is furnished with a hole at one end, as if to hold a line. The entire stone is an oblate circle about 3½ feet high and 4½ feet wide, and not very thick, lying flat on the ground. Close to it is an upright figure of "Minudaiyan Vírappan," with hands together in the attitude of respect or supplication, and a sacrificial post stood near.

The *grám-munsif* said that this "kóvil" or chapel was held in great respect by the country-folk and was originally there before the present fortifications were built. Sacrifices are still made in times of drought and dearth and are supposed to be very efficacious.

The temples at the base of Chenji and some of the sculptures and remains are very interesting, extensive and well wrought, but apparently modern, though quite deserted and going to ruin. The monkey god Hanumán is to be seen in several places sculptured on the rocks.

Since the road was made which passes through part of the Chenji fortress, it has been frequently visited and despoiled of its sculptured treasures. I was informed that the fine columns which adorn the "*Place*" at Pondicherry were removed hence by stealth, by an enterprizing Frenchman. But we need not grudge them, for they are appreciated highly where they are, instead of being neglected and lost sight of in the spot where they formerly lay.

Some very handsome sculptures have been removed and set up at Chittámúr, a few miles distant to the eastward, near a new temple built by a neighbouring chief.

The traditional founder of the fortress is said to be one Supálaka (or perhaps rather *Tupákala*) Náyak.

I may here mention that the Stalapuráṇa of Senji-Kóṭṭai was stated to have been taken away by the Collector of the District (S. Arcot), a few years ago, and never returned.

At Mailam (=*Mayúrastalam*) near Tindivanam, the Tamburán (or abbot) informed me that his temple was founded by King Jayamba or Jayambaga Mahárája, from the north, who also founded or built Senji-Kóṭṭai. This old fellow is a very fine specimen of a man who never touches flesh or any cooked food, but lives on fruit and milk only. He has repaired and restored his temple and is now building a fine stone gópuram on which I was shown a sculpture of himself in the style of an old bearded Rishi. He reminded me of the Tamburán (or abbot) of Tiru(p)panandál near Kumbakónam.

Another very interesting place I visited near Tindivanam is Perumukkal ("*Permacoil*" of Orme and of the Indian Atlas, sheet No. 78). Perumukkal is the common pronunciation in the district. At the place itself it is called, and written also, Perumukkúl.

Like Senji-Kóṭṭai it has been a fortified stronghold for some centuries. It has a fine large stone mandap on the summit and some small temples or shrines, but the ruins of some larger ones strew the summit, sides and base.

The rock is an isolated one of dark granitic boulders, very precipitous in most places. It is the last to the S. S. Eastward of the rocky masses that stud the plain of the Karnatik to the south-west of Madras.

I noticed stone circles at its eastern base, as well as at other stony places to the west and south-west, on both banks of the Ponniyár (S. Pennár or Pinákini.)

Mr. Garstin in the S. Arcot District Manual gives Peru-múkal (=great travail), from a legend of Sítadévi having here given birth to twins. There are two villages near, called Nalmukkúl (or Nanmukkúl) and Palamukkúl, names having reference to the same legend. Mr. Garstin also mentions Jánikipéṭṭai, and I may add Rámanáthapuram, all in the immediate vicinity. But the old Sanniyási or hermit sent for the stalapuráṇa (kept by an artizan in the neighbourhood) and wished to show me from it that the proper name of the hill is Mukkiyáchalam, and that it is therein styled Madhyakási (Middle Kasi) and is the scene of Rishi Válmíki's penance, death and burial. A ruined shrine attached to the mandap is pointed out as the spot where he was interred.

There are the remains of many fine sculptures here, destroyed by the Muslím, and many inscriptions on the base of the temples.

The fort was held and besieged repeatedly in the wars of the Karnátik in which much damage was done by the roundshot.

The following observation may be worthy of record.

At Gangaikoṇḍapuram the wells are said to have a perennial supply of good water near the surface, that fails not in the driest seasons ; and at Chidambaram the same is said of the great tank in the temple enclosure. At Tiruvaḍi (A S. 79), close to Panrutti, I noticed in the bed of the Geḍilam or Garuḍanadi (the "*Cuddalore*" river) a natural spring or fountain of clear water, welling up with some violence in the midst of the muddy river-water. It is said to be perennial and to be as good as Kávéri water, whence it is locally called *Kolladattumálai* = *Kolladam* or "water-spring".

In connection with these I may mention the artesian wells that have recently been opened at Pondicherry and suggest that the perennial supply at Gangaikoṇḍapuram, Chidambaram and Tiruvaḍi may be explained by there being at those places a connection with the water-bearing stratum which is the source of the artesian wells, underlying the extensive laterite beds of the *Cuddalore* or S. Arcot district. I have heard of other places, particularly near Villapuram on the South Indian Railway, where the subjacent springs have been tapped by the natives and the outflowing water long since utilized for irrigating their fields.

Rude Megalithic Monuments in North Arcot.—

By Lieut.-Colonel R. B. Branfill. (With a Plate.)

I have just had an opportunity of visiting the disused *tomb-field* at Iralabanda Bápanattam, in the Palmanér taluk of North Arcot.

The tombs here are of unusual interest from the size, shape and arrangement of the slabs of which they are composed, and the rarity of their chief characteristic.

The usual kistvaen or megalithic sepulchral cell is enclosed by three concentric rings of upright stone slabs, each slab having its top rudely worked (chipped or hammer-dressed) into a semicircular or a rectangular shape, and set closely side by side alternately, the round-heads standing higher than the intermediate flat-heads by the amount of their semi-diameter, *i. e.*, the height of the rounded portion, so as to form a parapeted wall of rounded *merlons* with flat silled *embrasures*.

These walls or parapets rise in three concentric tiers on a slight mound or cairn, a foot or so above the general ground level.

The outer circle or tier consists of some 24 slabs, nearly 3 feet wide, half of them being semicircular at top and standing about 3 feet high, the whole forming a ring fence or enclosing wall about 30 feet in diameter.

The second tier has 16 slabs, 8 of them round-headed, rising to a height of 5 or 6 feet above the cairn or mound; the whole forming an intermediate ring-wall about 22 feet in diameter.

The third or inner wall is composed of four prominent round-topped slabs, 8 to 10 feet wide, and 12 or 15 feet high above the cairn, and 4 or 5 feet higher than the other four flat-headed slabs that stand between them and complete the inner ring, an octagon of some 16 feet in diameter, or rather a square of 12 to 15 feet, with the corners cut off.

The kistvaen or sepulchral chamber nearly fills up the internal space, the capstone or covering slab of which sometimes projects horizontally beyond the chamber below it, so as to fit closely to the four great round-headed slabs that enclose it, the 4 flat-headed corner stones being only about the same height as the capstone, and narrower than the others.

The only entrance to the interior was apparently intended to be solely by small holes broken in the two or three central slabs on the east front, and nearly opposite to the similar hole in the eastern wall-slab of the kist. There is a kind of antechamber or closed portico between the inner chamber and the inner enclosing wall, provided with a moveable shutter stone or slab.

The stone slabs used throughout are comparatively very thin, being usually about 3 inches thick, and even the great capstones seldom exceed 6 inches.

The whole forms an imposing structure, and recalls the idea of a small citadel or fortification.

There are many examples, perhaps a score or more of this pattern, still partly standing, and about as many more of a very similar kind, only without the round-headed projections, all the slabs in each ring or tier being of the same height, about 7 feet above ground level, and completely hiding the enclosed kistvaen.

Dividing the tombs into three classes according to size, and counting the fallen and half buried, as well as those standing, there are 170 of the 1st or biggest, 210 of the 2nd, and 200 of the 3rd or smallest sort, a simple kist composed of slabs from 2 feet square and upwards, more or less buried in the earth, and without any enclosing walls or circle of stones remaining.

Most of the tombs in this *nekropolis* are much ruined and overgrown by jungle so that I suppose there may well have been many more than 600 tombs here, within a space 500 yards long and 300 wide. The interments have but a shallow covering of soil, sometimes less than one foot.

On excavating they were found to yield the usual sepulchral relics, except that iron weapons were very scarce or entirely absent, whilst the terra-cotta coffers were more abundant than in the similar tombs of Mysore. In one, a few ornamental beads, similar to some taken out of the Coorg tombs, were found lying near the remains of a human skull.

Some of the coffers, sepulchral troughs or trays, were ornamented with a chain ornament in festoons and furnished with projecting rings or loops and prominent hooks, as if to hang garlands on. Some were mere small flat oval troughs, whilst others ranged up to 4 feet long, 2 feet wide and high, and were furnished with four or five pairs of legs.

Perhaps however I need only further mention the chief novelty that struck me, and this may be no novelty to others.

Two or three Tamil letters were found scratched on a fragment of a little bowl. They seem to spell the words *saduma* or *chathum* or *chadud*; the final letter (? *m)* is very doubtful and may be intended for a terminal *d* or *t*, if that were admissible.

I have some rough notes and sketches of a few of the monuments, but had no leisure to explore further. A careful collection and close scrutiny of every fragment of the pottery (which is abundant and of the rude but antique and polished kind) would probably yield some valuable and curious information as to the habits, &c. of the tomb builders.

The locality has a bad character for being feverish and is in a very retired part of the country just above the Eastern Ghats.

The way to it lies through Chittúr and Palmanéri whence there is a good road for 15 miles to the S. W. to Baireddipalle, and thence a bridle path for 6 miles *viâ* Neilipatla to Bápanattam. The nearest name marked

on the old Indian Atlas, Sheet No. 78, is "Yerlabundah" (? Irala-rock). The Irala are the wild folk who roam the jungle in search of forest products and a free silvan life. During the rainy season some of them are said to dwell in these tombs, many of which would afford them perfect dwelling-houses, and the marks and relics of their recent occupation are to be seen frequently and unmistakeably.

I know of but three or four other places where these peculiar rounded slabs are to be seen, but they will probably be found to be more common when looked for.

The Coins of the Mahárájahs of Kángṛa.—*By* C. J. Rodgers.

(With a plate.)

Kángṛa is the name of a fort and town situated at the junction of two mountain streams which form a tributary of the Bías on its right bank ere it leaves the hills. The coins in the accompanying Plate II go by the name of Kángṛa coins now-a-days. But the rájahs whose coins they are were known in history by the name of the Rájahs of Trigartta, the country of the three rivers, the Rávi, Bías and Sutlej. The family of these Rájahs claims its descent from Susarma Chandra, governor of Multán at the time of the Mahábhárata. After the war was over they went to the hills for refuge and erected the fort of Kángṛa for their protection. The district under the Rájahs of Kángṛa seems to have been like all districts governed by such Rájahs in old unsettled times. Kángṛa was their mountain stronghold. The neighbouring district of Jalandhar was subject to them, and must have furnished a considerable portion of their revenue. So the Rájahs of Kángṛa would be known at that time as Rájahs of Jalandhar. Being of the lunar race they kept the title *Chandra* after their names.

The Indo-Scythians conquered the fort of Kángṛa. When Mahmúd conquered it "the genealogical roll of the Indo-Scythian princes of Kabul for sixty generations was found in the fortress of Nagarkoṭ by Mahmúd's soldiers"* (Kángṛa is known in the history of India by the name of *Nagarkoṭ*). From this fact, and from the immense amount of wealth taken from Kángṛa by Mahmúd, General Cunningham infers that "Kángṛa must have belonged to the Rájahs of Kabul for several generations, and

* General Cunningham's Archæological Report, Vol. V, for 1872-3, p. 155. The General quotes Abu Rihán's statement as contained in Al Biruni. I may here state that I am indebted to this report for nearly all my facts concerning the Mahárájahs of Kángṛa and to General Cunningham for much valuable aid generously given when I began to collect the coins drawn in the plate.

that it was their chief stronghold in which they deposited their treasures."* Not only this, but General Cunningham thinks that the wealth accumulated in Kángra at that time consisted of the silver pieces of the Hindu Rájahs of Kabul which are even now found so plentifully throughout the Panjáb—the coins of Samanta Deva, Syalapati Deva, Bhim Deva and Khadavaya Deva.†

One fact bearing strongly on this view the General seems to have overlooked. All the coins of the Kángra Rájahs with some few rare exceptions are of the horseman type. Some are of the bull and horseman type with the names of the Rájahs over the bulls. Nay more than this, the earliest Kángra coins bear the name of Samanta Deva over the bull. That they were coined in Kángra no one will doubt who will cast his eye over the coins of the Rájahs in the plate. I once attributed the first two coins to Susarma Chandra. But a careful examination of the letters together with the results of a comparison of the letters of other coins with these, has convinced me that they are the coins of Samanta Deva.

The list of names of the Rájahs of Kángra from Susarma Chandra down to the last Rájahs is of course obtainable. There is no reason for doubting its correctness. But as yet no coins have been found going further back than Prithví or Pithama to whom General Cunningham assigns the year 1330 A. D. This is an approximation only, but based on fair reasoning. Judging by the number of coins obtainable of any prince we may I think fairly infer the length of his reign. The fewness of the coins argues that the reign was short. Before Pithama I believe the coins of Samanta Deva were coined and used at Kángra. There are immense numbers of these coins found yearly in the Panjáb. Some of them have the horseman after the usual type, horse well shown and the whole body of the rider with letters on either side his head. The bull is well developed too and the name above it is generally legible. But the Kángra type of Samanta Deva, which the die-cutters of the mints of the Rájahs of Kángra seem to have slavishly adhered to, is unmistakeable, after it is once studied and known. The other well drawn coins are probably those of the Kabul or some other mint.

We must not be surprised if the coins of all the Rájahs are not obtainable. The coins of Kashmír, though very abundant, have many kings unrepresented. The coins of Chumba a neighbouring state to Kángra bear only the names of a few Rájahs, although the list of kings numbers no less than 170 sovereigns. Coining seems to have always been considered the peculiar privilege of paramount sovereigns or of independent rulers. Bearing this in mind, we need not wonder if any hiatus occurs in the lists of

* Ibid, p. 156.

† I have seen several hundreds of these coins this year.—C. J. R.

coins as compared with that of the Rájahs. Nor must we wonder if a small number of coins turns up bearing names of rulers to whom we cannot attribute any country. Jalandhar and Kángra must have been subject at different periods to Kashmír as well as Kabul and perhaps to Kanauj. General Cunningham gives the following list:—*

Accessions.	Name in list.	Name on Coins.	Remarks.
1330.	Prithvi.	Pithama.	
1345.	Purva.	Apurvva.	
1360.	Rupa.	Rúpa.	Contemporary of Fíroz.
1375.	Sringara.	Singára.	
1390.	Megha.	Megha.	
1405.	Hari.	Hari.	Brothers.
1420.	Karmma.	Karmma.	Brothers.
1435.	Sansára.	Sansára.	Contemporary of Muhammad Sayid of Delhi, A. D. 1433—1446.
1450.	Devanga.	Avatára.	There is *one* coin known of Devanga.
1465.	Narendra.	Narendra.	
1480.	Suvira.	.....	
1495.	Prayaga.	.....	
1510.	Ráma.	Ráma.	Died 1528, A. D.
1528.	Dharmma.	Dharmma.	
1563.	Manikya.	.....	
1570.	Jaya.	.....	
1585.	Vriddhi.	.....	
1610.	Triloka.	Triloka.	Rebelled against Jahángir, 1619 A. D. Triloka was the last king who coined. There are 12 more names given in the list.

A little study of Plate II will show that the coins are of several kinds. The commonest is that which has a bull on the obverse, with the name of Rájah above the bull. The reverse in every case except one has on it what is intended for an image of the horseman and horse. But as a rule there are only the legless hind-quarters together with the thigh and boot of the rider visible. The one mark on nearly all of them is the *spear* the horseman carries. First of all fixing this and remembering that the spear is carried close behind the man's thigh, to the right should come the horse's head and to the left the hind-quarters. But in reality only portions come on the coin. The die must have been as large as the silver coins of Samanta Deva which are a little broader than a four-anna piece. The boot is in some cases fully visible. But the head of the horseman is nowhere to be found. The spear has a notch on it near the bottom and a flag at the top. So it was a regular lance. Whether the man wore armour or not we can't say.

These coins are found in considerable numbers not in Kángra itself, but in Ludiána, Jalandhar and Umritsur. Vast quantities of them are how-

* Vol. V, Archæological Report, p. 152.

ever annually melted down and very soon there will be no more obtainable. Some of them may contain a very small amount of silver. It is very seldom I now meet with any in Umritsur. It is so with everything. I do not know what provision Government may be making to secure a cabinet of coins for the museums of the country. I believe no provision whatever is being made. A few private collectors are at work for their own cabinets which in the course of a few years will find their way to Europe. The coming generation will have to receive history on mere hearsay. The numismatic monuments are fast disappearing. The old Rájahs in many cases are known already only by name. No records are obtainable of them. One would think that before it is too late Government should interest itself in the matter. The British Museum is far richer in the coins of India than any Museum in India. This is a mistake. If India is to be for the Indians, it is a pity to export from the country all those mementoes of former things and dynasties. Patriotism and loyalty go hand in hand with us. It would surely be wise in our Government to create a love of country in the hearts of the people of India. We want something to displace the grasping and selfishness which everywhere show themselves. The historic remains which lie round about us are not understood, or are rather misunderstood and not valued. History is taught as a matter of dates and names and is useless. Museums are collections of odd things which are to the educated and uneducated alike voiceless. The teachers of history cannot read the coins which would add interest to their lessons.

Of all the provinces of India, the Panjáb has more historic associations than any other. From the time of Darius to that of the Empress of India, the Panjáb has been an arena on which great struggles have taken place. Yet the coin cabinet of the Lahore Museum is wretchedly poor. A few Græco-Bactrian coins, a few Indo-Scythian coins and a few odds and ends with the names attached to them of the persons who presented them (!) are all that are visible to the ordinary visitor. The curator, in whose charge are the valuable coins which are always kept under lock and key, is generally engaged during the day. So visitors passing through Lahore see next to nothing of what ought to be visible at all times. There is no catalogue of the coins, and many valuable ones have been already lost. This is again a mistake. It is exactly the same at Delhi, where the coins are all in a box!!

These remarks are made not in a captious spirit, but with a real desire to direct attention to the proper use of museums and provincial coin cabinets, and also with the hope that both be made more use of in the education of the people for whom the museums were built and with whose money they are supported.

I will now proceed to make a few notes on the coins represented in Plate II.

No. 1. is a coin of Samanta Deva. Obverse above bull *Srí Sam:* reverse horseman.

No. 2. is a coin of the same prince, with *Srí Samanta* above bull, reverse horseman.

No. 3. *Píthama.* Obverse Srí Píthama Chandra (Deva), reverse horseman.

No. 4. Ditto Obv. ditto., rev. do.

No. 5. Ditto. Obv. ditto., rev. do. Horse's neck ornaments shown and whole leg with pointed boot.

No. 6. *Apurvva.* Obv. Maharajah Srí Apurvva Chandra (Deva), rev. horseman plain and horse's eye visible.

No. 7. Ditto. Obv. Srí Apu(rvva) Chandra Deva Maharajah, reverse horseman.

No. 8. Ditto. Obv. Srí Apurvva Chandra, rev. horseman.

No. 9. Ditto. Obv. (Srí Apu)rvva Cha(ndra) Deva, rev. horseman.

No. 10. Ditto. Obv. bull, above which Srí Apu(rvva), rev. horseman.

No. 11. Rupa. Obv. bull, above which Srí Rupa Cha(ndra), rev. horseman.

No. 12. Obv. bull, above which Srí Rupa Chandra, rev. horseman. The horses of Nos. 10, 11 and 12, have beads round their necks.

No. 13. Apurvva. Obv. (Apurvva) Chandra Deva Maha(rajah), rev. horseman.

No 14. *Singára.* Obv. Mahárájah Srí Singára Chandra Deva, rev, horseman. Very poor.

No. 15. *Megha.* Obv. Maharajah Srí Megha Chandra Deva, rev. horseman.

No. 16. *Hari.* Obv. Maharajah Srí Hari Chandra Deva, rev. horseman. Neck ornaments and eye of horse visible.*

No. 17. Ditto. Obv. Mahárájah Srí Hari Cha(ndra Deva). The letters of the first line are all suspended from one line drawn across the coin as in Hindu letters. Rev. horseman. Head of horse, very much deteriorated.

(This king Hari soon after his accession tumbled into a well while out hunting. He was rescued after an interval of several days had elapsed. In that

* Since I wrote this article I have come across a coin of Hari हरी. The coin in the paper is of Hari हरि. Now in conversing a few days ago with General Cunningham on this matter I said that I was inclined to ascribe this rare coin to the king who was the brother of Karmma and who was hidden in a well for some days. He quite agreed with me. The coins of the paper which as I say are found in great numbers, would then resolve themselves into the coins of the king Hari who lived after Triloka, A. D. 1630-50, whose coins those of Hari resemble in make and letters.

interval however he was accounted dead: his brother ascended the throne, and his wives mounted the funeral pile. When he came back he found Karmma reigning, and he went and took up his abode in the outskirts of his brother's dominions. I cannot account for Hari's coins being so plentiful. Out of several thousands I have seen, I have seen only one of Karmma, while at least one-fourth of the whole must have been Hari's. A Hari succeeded Triloka: perhaps these or at least some of them may be his coins although General Cunningham's list closes with Triloka.)

No. 18. *Karmma.* Obv. bull, above which Srí Karmma, rev. horseman.

No. 19. *Sinsára.* Obv. Srí Sansára Chandra Deva, rev. horseman with a large flag on which is a peculiar mark.

No. 20. *Avatára.* Obv. Maharajah Sri Avatára Chandra Deva, rev. horseman.

(There is one coin of Devanga, the *god-bodied*, known; I gave one to General Cunningham.)

No. 21. *Narendra.* Obv. Maharajah Srí Narendra Chandra Deva, rev. horseman.

No. 22. *Dharmma.* Obv., in a square area which is surrounded by a circle of dots, Dharmma Chandra; rev., in a circle surrounded with a circle of dots, Durga Deví.

No. 23. *Triloka.* Obv. Maharajah Srí Triloka Chandra Deva. All the lines have the letters suspended from one line going across the coin. This coin and No. 3. are alike in this matter. Rev. horseman.

No. 24. Ditto. Obv. ditto without lines, each letter separate, rev. horseman. Hinder part of leg and thigh visible and hind-quarters and legs of the horse.*

The coins of Megha, Avatára Karmma and Dharmma are very rare. "The coins of Rupa, Singára, Sansára and Narendra are rare. Those of Pithama, Apurvva, Triloka and Hari are common. The Kángra types of Samanta Deva are very common."

* Where the whole name is not on the coins, the part omitted is in brackets.

Note on an Inscription found upon a stone lying near the ruins of a Masjid on Lanka Island, Wular Lake, Kashmír.—*By* Major H. S. Jarrett, B. S. C.*

The inscription which is in Persian, is as follows:—

این بقعهٔ چو بنیان فلك محکم باد مشهورترین زیب در عالم باد
شه زین عباد نادر و جشن کند پیوسته چوتاریخ خودش خرم باد

May this edifice be as firm as the foundations of the heavens,
May it be the most renowned ornament of the universe,
As long as the monarch Zayn Ibád holds festival therein
May it be like the date of his own reign,—"happy."

As is well-known the letters of the Arabic alphabet, like those of the Hebrew or Phenician and consequently of the Greek, are used as numerals, and the grouping of certain letters into a suitable word is frequently made to serve as a *memoria technica* among the Easterns to recall a date. In the above inscription, the numerical value of the letters in khurram (خرم happy) is 847 which is the year of the Hijra it is intended to record. This date is equivalent to A. D. 1443-4 during which Zayn-úl-Ábidín (the Zayn Ibád of the inscription—for both have the same meaning, *viz.*, ornament of the Adorers) ruled in Kashmír.

It may be interesting to glance cursorily over the events which preceded the accession of this prince from the period of the close of the last Hindu dynasty in the eleventh century of our era.

The Hindu history of that country has been discussed in a short Essay by Horace Hayman Wilson which will be found in the XVth Vol. of the Transactions of the Asiatic Society. He takes as his guide the first of the series of the Raja Tarangini, by Kalhan Pandit who commences his history with the fabulous ages and carries it down to the reign of Sangrama Deva the nephew of Didda Ráni in Sáka 949 or A. D. 1027 approaching to what Wilson considers to be the Pandit's own time Saka 1070 or A. D. 1148. The next two works of the series, *viz.*, the Rajavali of Jonah Raja and the Sri Jaina Rája Tarangíni of his pupil Sri Vara Pandit, continue the record to the accession of Fath Sháh, which Wilson places in A. H. 882, but is given by Muhammad Ázam author of the Persian history of Kashmír, as in A. H. 897 (A. D. 1491-2).

* [A rubbing of this inscription was sent to the Society by Mr. Arch. Constable. The stone bearing the inscription is apparently a slab of black slate, well polished and finished, and measures 21½ by 12 inches and 2½ inches thick. The rubbing was taken on the 22nd September, 1874. The inscription, as shown in the rubbing, contains several inaccuracies; thus in the 2nd line زیب is wrongly spelled ذیب; the 1st and 4th lines have جو instead of چو, two dots being omitted apparently for want of space. Ed.]

In the following survey I have followed the narrative of this last mentioned historian who calls himself the son of Khayr úz-Zamán and who commenced writing his history in the year 1147 A. H. (A. D. 1734-5) during the reign of Muhammad Sháh of Hindustán. His work follows the order of the Sanskrit and is divided into three periods, the first treating purely of the Hindu dynasties, the second of the Muhammadan, and the third of the subjugation of the country by the House of Timúr, with some concluding remarks on the features and curiosities of the country.

With the second period alone is this Note concerned, and the narrative is taken up at the accession of the last Hindu Rajah Sahdeo in A. H. 705 (A. D. 1305-6). During his reign occurred an irruption of the Turks under Zulju whose ravages left for generations the traces of his incursion. Forced to leave the country in the winter after a stay of eight months, the army, betrayed by guides, perished in the mountain snows. Many of the inhabitants of the country had fled in fear of their lives, some to Tibet, others, including Rajah Sahdeo, to Kishtwárah where he remained in hopes of some day recovering his crown. His General Rám Chand who had been among the fugitives returned to Kashmir with a refugee from Tibet named Rihjú to whom in former times he had accorded his protection. The country was now in a state of anarchy, each petty chief asserting his own independence. Rám Chand and his people occupied the fortress of Lár. Rijhú* or Rinjú (for the name is indistinctly written) seeing his opportunity gathered a few followers round him, made himself master by stratagem, of Lár, put Rám Chand to death and took his family prisoners. He now (A. H. 725 A. D. 1324) openly assumed the sovereignty, married the daughter of Rám Chand and won to his side the son of that Chief by granting him the government of Lár and Tibet and appointing him to a high command in the army. Though Buddhism was nominally the prevailing religion at this time, the country was distracted by the dissensions of sectaries, whose hostile and contending claims to religious truth perplexed the inquirer dissatisfied with the national religion. Such an inquirer was Rájá Rinjú, who after much perturbation of spirits and constant prayer, was led by divine inspiration—so runs the simple narrative—to watch a Moslem at his devotions. He saw, admired and believed, and soon led his court and people to embrace the Muhammadan faith. This monarch died in A. H. 727, after a reign of a little more than two years and a half, and the ruins of a once noble alms-house and a splendid mosque attest his reverence for the faith of his adoption. His widow Kotahrini† married Udayn Deo, brother of the last Rájá, who continued with his consort to carry on the government till the year A. H. 742, when he died. One of the Generals of the army coming

* The Rájataranginí has the name Rinchan.

† In the Rájataranginí Kotah Rani.

of a royal stock, named Shahmír who, settling in Kashmír in the reign of Sahdeo as a merchant, had fast risen to place and power, now thought himself strong enough to marry the twice-widowed queen and to usurp the crown. She refused his overtures, but he made himself master of her person, and she was forced to yield a reluctant consent to the espousals. She, however, slew herself during the marriage festival and Shahmír now became undisputed master of the crown (A. H. 743 A. D. 1342-3) and assumed the title of Sultán Shams-u'd-dín. He died in 747 A. H. (A. D. 1346-7) leaving two sons, Jamshíd and Ali Sher.

The reign of Jamshíd was short. He was defeated and slain in battle by his brother who succeeded him in 748 under the title of Alá-u'd-dín.

Alá-ud-dín's rule of ten years is marked by no important event. He died in A. H. 748 (A. D. 1356-8) and was buried at Alá-u'd-dínpúra.

His son Shaháb-u'd-dín succeeded to the crown on the death of his father. He employed his energies in clearing the country of rebels and marauders, and annexed Pakli, Dantaur and the tract, called the Sawád Kabír, to the crown. He wrested Tibet from the ruler of Káshghar and ventured to march towards India, then ruled by Firúz Sháh. After a campaign in which the victory was with neither party, peace was concluded on these conditions that the country from Sirhind to Kashmír should appertain to Shaháb-'ud-dín, while all to the eastward should acknowledge the sovereignty of Firúz Sháh. Muhammad Ázam* notes with surprise that this fact, which he says is mentioned by many historians, is left unnoticed by the author of the Táríkh-i-Firuz Sháhi. I may add that it is equally omitted by Elphinstone. (A. H. 758, A. D. 1356-7.)

On his return to Kashmír, he built the capital of Shaháb-u'd-dínpúra of which now not a trace but the ruins of a mosque remain, and he destroyed the large idol temple at Bijárah.† In the year A. H. 778 (A. D. 1376-7) he died.

Ḳuṭb-úd-dín his brother succeeded him in A. H. 780 (A. D. 1378-9). He ruled with justice and moderation and was celebrated as a scholar and a poet. Ḳuṭb-úd-dínpúra commemorated his name and the metropolis of his kingdom. He died in A. H. 796 after a reign of sixteen years. During his time occurred the advent to the court of Sayyid Ali Hamadáni, the sixteenth in direct descent from Ali-b-Abi-Tálib, the son-in-law of Muhammad. He was revered for his sanctity and eminent virtues, and his influence guided the counsels of the monarch. The Sayyid bestowed on him his own cap which Ḳuṭb-úd-dín wore in the royal crown. It is feigned that

* His son Muhammad Aslam, who is the author of the History of Kashmír entitled the Gohar-i Aálam and has made considerable additions to his father's work, goes so far as to say that the conquests of Shahab-úd-dín were carried northwards beyond the Oxus and southwards beyond Lahore.

† Called also Bihárah or Bij Bihárah.

its efficacy secured the throne to the monarch's successors until the reign of Fath Sháh who directed it to be buried with him, from which period dates the decline of the dynasty.

His son Sultán Sikandar, better known by the title of the Iconoclast from the number of idols he destroyed, assumed the sovereignty in A. H. 796 (A. D. 1393-4). During his reign, the rapid advance of Timúr on his march to India, induced Sikandar to conciliate the Tartar conqueror by despatching his son Sháhi Khán known afterwards as Zayn-u'l Aábidín to his court with presents and friendly letters. Timúr gratified by this conduct, left him in possession of his territory but detained Sháhi Khán in Samarkand which he never left until Timúr's death. Sikandar after a reign of twenty-five years and nine months, died in A. H. 822. A superb mosque which contained 372 columns, each 40 cubits in height and 6 in circumference, was begun and completed by him in the space of three years under the direction of two famous architects Khwajah Sudr-úd-dín Khorasáni, and Sayyid Muḥammad Nuristáni. To his piety was also owing the erection of the great mosque of Bijárah, and with the exception of the rattle of the royal kettle-drums, no profane music was permitted to disturb the austere tranquillity of his capital. Through his munificence the walls of the romantic gardens of Shalimar were extended as far as the Parganah of Phág and their stability was assured or blessed by the burial beneath their foundations of all the Hindu works that could be collected. As these treated either of idolatrous rites, astrology or history that was fabulous, they were considered by the monarch as condign objects for destruction.

He was succeeded by his son Ali who reigned but six years and nine months. This prince bent upon performing the pilgrimage to Mecca resigned his kingdom in A. H. 828 into the hands of his famous brother Zayn úl Aábidín and set out on his journey. A. H. 822. (A. D. 1419).

A H. 828. (A. D. 1424-5.) Zayn úl Aábidín was noted early in life for his abilities. He employed the time he had spent in Samarkand in adding to his store of knowledge, and on his return to his country he brought with him a number of artificers, such as paper-makers, book-binders, carpet-weavers, saddlers and others to improve the industries of his own land. His brother Ali having reached the territory of his father-in-law the Jammu Chief, was persuaded by him to abandon his pilgrimage and resume his sovereignty. Returning therefore with an army, he was met by his brother Zayn úl Aábidín, who gave him battle, defeated him and placed him in confinement wherein he shortly after died. The powerful faction of the Gurjis who in the time of his father possessed great influence in state affairs, and who favoured the cause of his brother, was exterminated by him at Naushahr, at which palace he erected a place for his own residence.

His time was now spent in promoting the prosperity of his country

and in repairing the ravages of the irruption of the Turks under Zulju which the lapse of more than a century had not yet been able to efface. He was a liberal patron of men of letters and encouraged the progress of the arts, especially favouring the artificers whom he had introduced from Samarkand. He travelled much over his dominions and his Hindu and Muhammadan subjects lived at peace with each other undisturbed by religious dissensions, which if they arose were amicably settled by punchayets at which the monarch himself would preside. This conduct gained for him the title of the Great King.

According to tradition in the vicinity of the Wular lake once stood a city of which the Rájá was Sudrasen. By reason of the enormity of his crimes, the waters of the lake rose and drowned him and his subjects. It was said that during the winter months, at low water, the ruins of a submerged idol temple might be seen rising from the lake. Zayn úl Aábidín constructed a spacious barge which he sank in the lake and upon which he laid a foundation of bricks and stones till it rose high enough to be level with the water. Upon this he erected a mosque and other buildings and gave the islet the name of Lanka. The expense of the work was defrayed by the fortunate discovery of two idols of solid gold which had been brought up from the lake by divers. On the completion of Lanka the king ordered a great festival to be held wherein great sums were distributed amongst the poor. Verses were written by the poets to commemorate this event, and among these the inscription under notice by Ahmad Allámah Kashmíri was engraved upon a stone and placed above the Mihráb or sanctuary of the mosque. This Ahmad Kashmíri was the author of the Núrnáma, a Persian translation made in the time of Zayn úl Aábidín of an ancient History of Kashmír in the Kashmirian language by Shaikh Nur-úd-dín Wali. His translation was made use of by Muhammad Aslam the son of Muhammad Ázam, in amending the omissions of his father's History. Mention of the slab with its inscription is made by Muhammad Ázam who gives a faithful transcript of the verses Muhammad Aslam states that he visited Lanka in 1167 A. H. (A. D. 1753) and observing the inscription carried it in his memory and records it in his work. His second line runs thus—

مشهور به زیب و زین در عالم باغ

which shows that either his memory failed him or he was unable to decipher the line more correctly given by his father.

The further history of Zayn úl Aábidín it is perhaps unnecessary to record. He died in A. H. 880 (A. D. 1475) and was succeeded by his son Hydar Sháh. His tomb may still be seen below the Zayna Kadal, the fourth of the thirteen bridges that span the river Jhelam in its course through the valley of Kashmír.

Coins of the Sunga or Mitra Dynasty, found near Rámanagar or Ahichhatra, the ancient Capital of North Panchála, in Rohilkhand:—the property of H. Rivett-Carnac, Esq., c. i. e., f. s. a., &c. *Described by* A. C. Carlleyle, *of the Archæological Survey of India.*

(With a Plate.)

The great ruined site of *Ahichhatra*, the ancient capital of North Panchála and now known as *Rámanagar*, has of late been yielding a plentiful supply of the coins of the Sunga or Mitra dynasty. Mr. H. Rivett-Carnac has been so fortunate as to procure a considerable number and variety of these coins from that find-spot, and he kindly placed them in my hands for examination and identification.

The fact of so many coins of this dynasty having been found so far to the north-west from their proper capital city, Pushpapura (or Pataliputra), may perhaps be held to be a proof of the wide extent of their sway. While making some excavations at Bhuila, the site of the ancient city of Kapilavastu, in the Basti district, I obtained a considerable number (probably about a hundred) of the coins of the Mitras, dug newly from the soil, in deep excavations, while I was present on the spot; they were mostly of Agni Mitra and Indra Mitra, with a few of other later kings of this dynasty. These coins were mostly of small size; but the coins obtained by Mr. Rivett-Carnac, from Rámanagar, are mostly of the largest size, with three or four only of the smallest size.

About one hundred and ten of these coins, belonging to Mr. Rivett-Carnac, have passed through my hands; and of these, several bear names of kings which are either new, or of rare occurrence, such, for instance, as *Bhadraghosa*, *Phagûni-mitra*, *Surya-mitra*,* and *Anu-mitra*,—besides several coins of *Bhánú-mitra*, which were already known. The most numerous coins were those of Bhúmi-mitra, and the next numerous were those of Phaguni-mitra,—after whom, in the descending scale of number, followed Agni-mitra, Bhánu-mitra, Surya-mitra, Bhadra-ghosa and Indra-mitra; with also a very few, from other localities, of the later kings, whose coins are of quite a different type, such as Vijaya-mitra, Jaya-mitra, Satya-mitra and Saya-mitra.

From the numerical proportion in which the coins of various kings are found in a hoard, we can generally make a pretty good guess as to who were the earliest, and who the latest, of the series. Thus, the king of

* [This name was at first read *Srayan-mitra* by the author. General A. Cunningham first suggested the true reading *Suya* or *Surya-mitra*; see Proceedings As. Soc. Beng., January 1880; see also below p. 28, Ed.]

whom the greatest number of coins are found in a hoard, may be accepted as being either the latest, or the contemporary king, of the dynasty, at the time when the hoard was buried or lost; while the king of whom the fewest and most worn coins are found may be accepted as the earliest, in point of time, of the series. But a similar numerical proportion of coins of different kings may, sometimes, also have been brought about by accidental circumstances; and therefore we must, in all cases, be guided by the older or later forms of the alphabetic characters, which appear in the legends on the coins.

But if we follow the rule enunciated above, in a general sense, with sufficient judgment and discrimination, we may apply it in the present case. Thus, as the coins of Bhúmi-mitra are the most numerous, in proportion, in the hoard found at Rámanagar, we may suppose that he was the latest king of the dynasty, at the time when the hoard was buried, and that the hoard was buried during his reign.

In like manner, as the coins of Phaguni-mitra are the next in point of number, to those of Bhúmi-mitra,—or in fact nearly equalling them,—and were, at the same time, far in excess of the coins of any of the other kings, we may conclude that Phalguni-mitra, was the immediate predecessor of Bhúmi-mitra.

The coins of Agni-mitra and Bhánu-mitra follow next behind, in numerical proportion. But as the coins of these two kings are nearly equal in number, it becomes difficult to decide which of them was prior to the other. There is, however, one marked distinction about the coins of Bhánu-mitra and that is, that the central symbol, of the three symbols above the name, is always punched into the coin, with a square punch; and the symbol in this square punch-mark depression is generally a repetition of the raised symbol to the right of it; while on the coins of other kings, the central symbol is generally different from either of the other two. Now this central square punch-mark depression I have also found on a few coins of *Surya-mitra*, who, from the greater rareness of his coins and the rather more antique form of the alphabetic characters of the legend, I consider to have been a predecessor of Bhánu-mitra,—and from these two kings' coins having the square punch-marked depression in common, I should say that Bhánu-mitra must have been the immediate successor of Súrya-mitra. Agni-mitra must therefore be of later date, and should probably follow immediately after Bhánu-mitra.

The coins of Bhadra-ghosa are the fewest and the most scarce of all. And the alphabetic characters of the legend, are of an older type than on any of the other coins, and more nearly approach the forms of the old Lat character of Aśoka. Moreover the large coins of Bhadra-ghosa are very much worn, so much so that the legend is blurred and indistinct.

But Mr. Rivett-Carnac has one most beautiful little coin of Bhadraghosa, of very small size, on which the legend is as clear and distinct as possible,—really wonderfully clear for such a small coin.

The occurrence of only one undoubted coin,—besides one doubtful one,—of Indra-mitra, in this collection, is somewhat puzzling to me,—because, from the style of the alphabetic characters on his coins, I do not think they are so ancient as those of some of the other kings; and I would be inclined to place him certainly after Agni-mitra. The only reason that I can offer for this comparative (and perhaps only apparent or local) scarceness of the coins of Indra-mitra, is that his reign may have been a short one, and either that his residence was in some different part of the country, or that the distribution of his coinage was partial I did not find that the coins of Indra-mitra were any more scarce than those of other kings, among the coins of this dynasty which I obtained at Bhuila (Kapilavastu).

But, in the present case of the Rámanagar coins, I think there may be another way of accounting for this, probably merely temporary or local, scarceness of Indra-mitra's coins. I would suggest that Indra-mitra was the son and immediate successor of Bhúmi-mitra, and that the Rámanagar hoard was buried immediately after the death of Bhúmi-mitra, and in the early part of the first year of the reign of Indra-mitra. This would account for the plentifulness of Bhúmi-mitra's coins, and the scarceness of Indra-mitra's, in the Rámanagar find.

I will now give a list of those Mitra kings whose names have been in any way authenticated; and I will place them in the chronological order in which I think they should be placed; and opposite to the names of those of whom coins were found in the Rámanagar hoard, I will place the number of each found, respectively.

Initial Date.	Names of Kings.	Number of *Coins* found at Rámnagar.
B. C. 178.	Pushpamitra, ...	(*None.*)
	Bhadraghosa, ...	5
	Surya-mitra, ...	7
	Bhánu-mitra, ...	10
	Agni-mitra, ...	11
	Anu-mitra, ...	1
	Phaguni-mitra, ...	28
	Bhúmi-mitra, ...	34
	Indra-mitra, ...	1, *certain.*
		1, *doubtful.*

I will now proceed to give a detailed description of the coins themselves, see Plate III.

I.—Bhadraghosa.

1. Coin, very small.

Obverse.

A square depression, caused by a die, containing the legend, with three symbols above it,—Bodhi Tree, Linga, and Serpents.

Legend—Bhadraghosasa.

Reverse.

A curious dumpy figure, as broad as long, of Buddha standing teaching.

2. Coin, large.

Obverse. A square depression, containing the Legend, with three symbols above it.

Legend—Bhadraghosasa.

(Note.—The three symbols above the legend are, to the left a Bodhi Tree standing on a square base or in a square railing;—in the centre, a linga guarded by two serpents (Nágs) which rise up on each side of it—; to the right, two serpents intertwined, forming a circular knot in the centre, with their two heads extending out, right and left, above, and their two tails extending out, right and left, below. This same description will apply to all other coins bearing these symbols.)

Reverse.

Two objects, not distinct.

II.—Surya-Mitra.

3. Coin, middle-sized, pretty large.

Obverse.

In a square depression, the legend, with three symbols above it.

Legend—Surya-mitrasa.

Symbols above legend:—To left, Bodhi Tree, as before. To right, two serpents intertwined, as before. In centre, a square punch-marked depression, containing a symbol, which appears to be composed of several snakes intertwined.

Reverse.

Device indistinct. (But, on another coin, it appears to be the symbol of Sangha with the Buddhist Wheel of the Law, below it.)

4. Coin same size as the former.

Obverse.

In a square depression, the legend below, with three symbols above it.

Legend—Surya-mitrasa.

Symbols above the legend:—To left, Bodhi Tree, as before. To right, two serpents intertwined, as before. In centre, linga guarded by two serpents (Nágs) whose heads rise above it on each side.

Reverse.

Apparently the symbol of Sangha, with the Wheel of the Law of Buddha. (This was referred to, in describing the previous coin, the reverse of which is defaced.)

III.—Bhánu-mitra.

5. Coin pretty large.

Obverse.

In a square depression, the legend below, with three symbols above it.

Legend—Bhánu-mitrasa.

(Sometimes the last part of the name appears to be *mitrasa*.)

Symbols, above the legend. To the left, the Bodhi Tree, as before. To the right, two serpents intertwined, as before. In the centre, a square punch-mark depression, containing a symbol composed of four snakes intertwined, and forming a squarish shaped figure.

Reverse.

The symbol of Sangha surmounted by the Wheel of the Law of Buddha. But it is possible that it may be intended for a figure of the Sun *(Bhánu)* placed above a pedestal.

IV.—Agni-mitra.

6. Coin, large.

Obverse.

In a square depression, the legend below, with three symbols above it.

Legend.—Agimitasa.

Symbols above legend. To left, Bodhi Tree, as before. To right, two serpents intertwined, as before. In centre, Linga, guarded by two serpents (*Nágs*), one on each side.

Reverse.

Figure of Buddha standing, with right hand raised, and rays radiating from his head. He stands on a Buddhist Railing, between two trees.

7. Coin, middle-sized, rather small.*

Obverse.

Legend and *symbols* the same as in the preceding.

Reverse.

Buddha standing, with right hand raised, and flames ascending from

* [This is a mistake; coin No. 7 in the Plate is not one of Agni-mitra, but of Bhúmi-mitra, like No. 10. By a mischance the wrong coin seems to have been sent to be figured; Ed.]

his head and shoulders. He stands on a sort of ornamental pedestal, probably representing the Lotus.

V.—Anu-mitra.

8. Coin, very small.

Obverse.

Surface of obverse of coin, concavely depressed. Legend in a line below. Three symbols in a line above.

Legend—Anu-mitasa.

Symbols, the same as on the coins of Agni-mitra.

Reverse.

A Buddhist Railing. Above it, a large round ball, surrounded by a circle of dots. On each side below, a small round ball, with a curved semi-circular figure below it, the concavity of the curve being turned downwards; these two latter symbols resemble in shape the later modified old Indian form of the letter "T", just preceding the Gupta period. I think the central symbol above (namely the round ball surrounded by a circle of dots) may be intended to represent the Sun.

VI.—Phaguni-mitra.

9. Coin large.

In a square depression, the legend below, with three symbols above it.

Legend—Phagúni-mitrasa.

Symbols, above the legend. To left, Bodhi Tree standing on a square pedestal. To right, two serpents intertwined. In centre, a Linga, with two serpents (Nágs) twined round it, their hoods raised up on each side of it.

Reverse.

Buddha standing on a lotus, with a canopy over his head.

VII.—Bhúmi-mitra.

10. Coin, large.

Obverse.

In a square depression, legend in one line below, with three symbols in a line above.

Legend—Bhúmi-mitasa.

Symbols, Bodhi Tree, Linga with serpents (Nágs), and two serpents intertwined in a knot,—as on the coins of Phaguni-mitra and Agni-mitra.

Reverse.

Buddha standing between two trees, on a Buddhist Railing. Rays or flames ascend from the head of Buddha.

VIII.—Indra-mitra.

11. Coin, rather small.

Obverse.

Legend and three symbols in a square depression, as on the other coins.

Legend.—Indra-mitasa.

Symbols, the same as on the two preceding coins.

Reverse.

A squat figure of Buddha, above a Buddhist Railing.

(*Note*:—The legend on some other coins of Indra-mitra, which I have seen, appeared to read simply as "Inda-mitasa," while on a few it seemed to have the still more mutilated form of "Ida-mitasa."

SUPPLEMENTARY NOTE.

Since my Paper on the coins of the Sunga or Mitra Dynasty was forwarded to the Asiatic Society of Bengal, I have seen in the collection of Mr. Rivett-Carnac, another apparently unique coin of a king of this dynasty called *Ayu-mitra*, which I believe to be a new name. This king must have been one of the latest of the dynasty, as the letters of the legend belong to the later Gupta period.

Description.

Coin, round, middle sized, copper.

Obverse. Bull.

Inscription, underneath, A-yu mi-ta-sa.

Reverse. Apparently a Peacock and Palm-tree ?

The legend on this coin is clearly and distinctly just as I have given it above, and there can not be any doubt whatever about it. This coin therefore must not be confounded with the common, though similar, coins of Saya-mitra, with which I am well acquainted.

In order to complete the list, I may mention that I have heard from General Cunningham that he has a coin of a king of this Dynasty named Dhruva-mitra. But as I have not seen General Cunningham's coin and therefore I do not know its age, I can not tell where to place Dhruva-mitra in the line of succession. But no doubt General Cunningham will describe the coin himself.

With the sole exception of the last named king, I think I feel pretty certain of the place which the rest of the Mitra kings respectively should

occupy in the order of succession. We now know of fourteen kings of this dynasty, and I would place them as follows :—

1. Pushpa-mitra.
2. Bhadraghosa.
3. Surya-mitra.
4. Anu-mitra.
5. Bhânu-mitra.
6. Agni-mitra.
7. Phâguni-mitra.
8. Bhûmi-mitra.
9. Indra-mitra.
10. Vijaya-mitra.
11. Satya-mitra.
12. Saya-mitra.
13. Ayu-mitra.

The fourteenth king would be General Cunningham's Dhruva-mitra; but not having seen the coin, I can not tell in what position to place him.

Of course I have never seen any coin of Pushpa-mitra; but he is nevertheless sufficiently authenticated otherwise; but I have seen and examined coins of all the remaining twelve kings.

With regard to the name *Surya-mitra*, I may now state that I have since seen several other coins of this king, and that the result of my examination of these other and more perfect specimens is that the name must be read *Suya* or *Surya* Mitra; and in this I agree with General Cunningham. On most of these coins the name appears to read as *Suya*, with a dot (anuswara?) above the *y*; but on at least one coin, the name reads clearly as Surya, the *repha* appearing quite plainly on the top of the *y*.

Coins of Ghiás-ud-dín and Mu'az-ud-dín bin Sám.—*By* C. R. Stülpnagel, M. R. A. S.

(With a Plate.)

The extracts from the Tabakát-i-Násirí made by Sir Henry Elliot in his History of India contain but little information concerning Ghiás-ud-dín of Ghór, nor is this want of details much to be regretted except for the fact that the coins obtained hitherto generally join the name of this ruler with that of his younger brother Mu'az-ud-dín who is looked upon as the first Pathán king of Delhi. It is stated that when 'Alá-ud-dín Husain, surnamed Jehán-soz, ascended the throne of Fíróz-kóh, he imprisoned his two nephews Ghiás-ud-dín Muhammad Sám and Mu'az-ud dín Muhammad Sám in a fort of Wahíristán, and settled an allowance for their maintenance. He took Ghazní, but did not make it his permanent residence. After his death he was succeeded by his son Sultán Saif-ud-dín. This king released the two

princes, his cousins, of whom Ghiás-ud-dín dwelt peacefully at Firoz-koh, taking service with the Sultán Saif-ud-dín, whereas the more adventurous Prince Mu'az-ud-dín proceeded to Bámián and there found employment under his uncle Fakhr-ud-dín Mas'úd. But when Ghiás-ud-dín succeeded to the throne of Ghór after Saif-ud-dín's tragical death, Fakhr-ud-dín instigated his nephew Mu'az-ud-dín to bestir himself and likewise acquire a regal position. The latter accordingly started in all haste to his brother's court where he was received in a friendly spirit. He served Ghiás-ud-dín one year, after which the countries of Kasr-kajúrán and Istiya, between Herat and Ghazní, were assigned to him; and at a subsequent period he obtained possession of the city Takínábád, specially noted as the largest town in the Garmsír. In 569 A. H. (1173 A. D.) Sultán Ghiás-ud-dín conquered the town of Ghazní, but returned to Ghór after placing his brother Mu'az-ud-dín upon the throne, who secured in addition the territories of Ghazní and the country round about in 570 A. H. In the third year after this time, Mu'az ud-dín led his forces to Multán, and henceforth his history becomes merged in that of India. Of Sultán Ghiás-ud-dín scarcely anything more is known, but it should be remembered in his favour that, instead of getting his brother murdered, he treated him with the greatest kindness, and always associated his name with his own on the coins of the realm. Ghiás-ud-dín died at Herát in 599, and Mu'az-ud-din was murdered by the Gakkars at Rohtak in 602 A. H.

Coins in the joint names of Ghiás-ud-dín and Mu'az-ud-dín have already been published by Mr. Edward Thomas in his "Chronicles of the Pathán Kings of Delhi," two of which are of gold and two of silver, the latter being ingraved in the first plate and numbered one and two, the latter being identical with the one described by Wilson in the *Ariana Antiqua*, pl. XX, 29. I have lately acquired eight specimens of dirhems of these Ghori brothers, all of them different from those already described. Of these, three are similar to No. 1, pl. I of Mr. Thomas's book; see Plate IV. They are of silver weighing, on an average, 74 grains and have their legends arranged in three concentric circles, the patronymic occupying the centre. The first, however, differs in this that the outer circle containing the date (597) is found in the *obverse* with the name and title of Ghiás-ud-dín, and not on the reverse as on Mr. Thomas's coin. I thought it at first just possible that the engraver might have committed a mistake, and changed the outer circles of the obverse and reverse, but such a supposition is unlikely from the transcript of the coin in the body of the book, which clearly shows that the date belongs to the reverse. Moreover it is totally immaterial on which side the date is actually placed, and it is actually found on the reverse together with Mu'az-ud-dín's name, on two of the coins described in the

sequel of this paper. Although the margins are both a little abraded, they can with ease be supplied from the next coin. I may, however, remark that this coin could not have contained the name of the month of the year, as there is not sufficient space for its insertion.

The following is the transcript:

Date 597.

Obverse.

First circle. ضرب الدرهم في * * سنه سبع و تسعين و خمس مايه

Second circle. لا اله الا الله محمد رسول الله السلطان الاعظم

Third circle. غياث الدنيا و الدين ابو الفتح

Centre. محمد بن سام

Reverse.

First circle. هو الزى رسل رسوله بالهدي و دين الحق ليظهره * * *

Second circle. الناصر لدين الله السلطان المعظم معز

Third circle. الدنيا و الدين ابو المظفر

Centre. محمد بن سام

The last two of the three coins with concentric inscriptions referred to above, differ from the first in this that they have the arrangement of date just as in the Thomas's pl. I, No. 1; *viz.*, the date (596) is placed on the reverse containing the name of Mu'az-ud-dín. The size, however, is smaller, and the letters less bold. The *Ariana Antiqua*, pl. XX, 35 is probably a similar coin to my two; but as Wilson, owing to the worn condition of the coin in his possession, was unable to describe it, I include it in this paper. The outer circle of the obverse contains the Súrah common to all Ghori coins; the second has half the Kalima, which is afterwards continued in the second circle of the reverse; and the third circle and centre show the names and titles of Ghiás-ud-dín. The reverse has in the first or marginal circle the place of mintage and the month and year in which the dirhem was struck. Part of the second and the third circles and the centre, like those of the obverse, contain the titles and names, but of Mu'az-ud-dín.

Ghazni, month Zi-ul-hajja, A. H. 596.

Obverse.

First circle. هو الزى رسل رسوله بالهدى و دين الحق ليظهره على الدين كله ولو كره المشركون

Second circle. لا اله الا الله الناصر لدين الله السلطان الاعظم

Third circle. غياث الدنيا و الدين ابو الفتح

Centre. محمد بن سام

Reverse

First circle. ضرب هذا درهم في بلده غزنه في ذى الحجه سنه ست و تسعين خمس مايه

Second circle. محمد رسول الله السلطان المعظم معز

Third circle. ادنيا و الدين ابو المظفر

Centre. محمد بن سام

The other five coins have never been described before, as far as I know, and are quite of a new type. They were obtained from an itinerant Kabuli who was very shy in speaking of the place where they had been originally procured; but as in his conversation he said that he had been in Ghazni and Kabul, and had lately come to Lahore by way of Jellalabad, it may be reasonably presumed that they were not found in the Panjáb, but in the Kabul valley, or perhaps in or near Ghazni. All of these coins are likewise binominal. The weight is between 56 and 79 grains. The area on either side is a square composed of double lines, with the inscription arranged in five lines. The enclosing margin is of course in four sections. It is bounded by double circles. The margins are partially abraded, but fortunately one coin is sufficiently well preserved and the following inscription can be therefore made out with accuracy:

Dates 597 and 598.

Obverse.

Area :— لا اله الا الله
محمد رسول الله
السلطان الاعظم
غياث الدنيا و الدين
ابو الفتح محمد بن سام

Margin :— هو الذى رسل رسوله بالهدى و دين الحق ليظهره على الدين كله

Reverse

Area :— الناصر لدين الله
السلطان المعظم
معز الدنيا و
الدين ابو المظفر
محمد بن سام

Margin :— ضرب هذا الدرهم في شهور سنه ثمان وتسعين و خمس مايه

Of these five dirhems, four have the date on the reverse together with the name of Mu'az-ud-dín, and one on the obverse. None contains the place of mintage.

All these coins, bearing evidence to the joint rule of the two brothers, are dated 596, 597 and 598 A. H., and must have been issued towards the end of their reigns, for Ghiás-ud-dín died in 599 and his brother three years afterwards. Comparing the titles of the two sons of Bahá-ud-dín Sám, the elder, Ghiás-ud-dín, is always called "ul'azam" the greatest, Sultán, ul nasr-l-dín illah and abúl fath, whereas to his younger brother are applied mu'azm, "great," Sultán, nasr-l-dín and abúl muzafr. It was only after the death of Ghiás-ud-dín that Mu'az-ud-dín called himself by the higher sounding title of 'azam.

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part I.—HISTORY, LITERATURE, &c.

No. II.—1880.

A Collection of Hindí Roots, with Remarks on their Derivation and Classification.—*By* Dr. A. F. Rudolf Hoernle.

This Collection was prepared by me some years ago and was originally intended to form part of my Comparative Grammar of the Gaudian Languages, and to illustrate the Chapter on Roots. The present introductory remarks give the substance of that chapter.

The Hindí, like any other language, possesses roots. By this term I here mean the constant element in any series of sense-related words. Thus in the Hindí words *bol-í* "speech," *bol-áhaṭ* "calling," *bol-ánā* "speaking," *bol-á* "spoken," *bol-ai* "he speaks," &c. the constant element *bol* is the root; the remainder are suffixes and vary according to the meaning which is to be expressed by means of the root.

A root may be determined in Hindí, or for that matter in any Gaudian language, by detaching the suffix of the 3rd person singular present *ai* (or *e*) from the word, when the remainder will be the root. Thus in *bol-ai* "he speaks," *kar-ai* "he does," *bújh-ai* "he understands," *bol*, *kar* and *bújh* are the roots respectively.

For comparing Hindí roots with Sanskrit, this is the most convenient rule. For a large number of Hindí roots are not derived from the pure Sanskrit root, but from that modified form of it, which is confined to the present tense (or the so-called special tenses generally). Thus the Sanskrit root *budh* "understands," takes the form *budhya* in the present tense, whence arises the Hindí form *bújh*. From the Sanskrit *budh* comes the 3rd person sing. present *budhyate*, in Hindí *bújhai*; but from it comes also the participle future passive *boddhavya* "to be understood"; in Eastern Hindí this form is *bújhab* or *bujhib*, Western Hindí

bújhibau, which transliterated into Sanskrit would be *budhyitavya*. This shows that in Hindí the form *bújh* acts as a root, precisely as *budh* does in Sanskrit.

Putting aside mere phonetic differences, as in the Hindí *sikh* or *síkh*, Maráṭhí ṣik "learn," Eastern Hindí *char*, Western Hindí *chal* "walk," the Gauḍian languages differ very little with regard to their roots. There are, however, a few exceptional cases of roots which are confined to some particular Gauḍian language. Thus "see" is in Sindhí *pas*, Maráṭhí *páh*, but in Hindí *dis* or *dekh*, the Sanskrit *paṣ*, *prekṣh* and *dṛiṣ*; again "come" is in Sindhí *ach*, Bangáli *áïs* or *ás*, but in Hindí *áv* or *á*, the Sanskrit *ágachh* and *áyá*.

Roots, as a rule, do not undergo any change, when entering into conjunction with suffixes; except in the formation of the Causal Verb, in which case a long vowel is always shortened; thus *bol-aná* "to speak," but *bul-ánú* "to call"; *chhoṛ-aní* "to loose," but *chhuṛ-ánú* "to cause to loose"; *ghúm-aná* "to turn," but *ghŭm-ánú* "to cause to turn"; *pí-ná* "to drink," but *pi-lánú* "to cause to drink", &c. There are, however, a few exceptional cases of changeable roots. These are *kar* "do," *dhar* "place," *já* "go," *le* "take," *de* "give," *mar* "die." These roots assume a considerably different form in the formation of the past participle and past tense; *viz.*, the first five become *ka* or *ki*, *dha* or *dhi*, *ga* or *gi*, *la* or *li*, *da* or *di* respectively, and *mar* becomes *mu*. The regular, unchanged forms, however, also occur, and generally these three forms are peculiar to some one or other of the Hindí dialects. Thus the High Hindí has the past participle *ki-yá* "done," Eastern Hindí *ka-il* or *ka-yal*, but Western Hindí *kar-au*; Eastern Hindí also has the radical form *ki* in *ki-his* "he did," *ki-hin* "they did."* So also High Hindí *mu-á* or *mar-á* "dead," Eastern Hindí *mu-il* or *mu-al*.

Roots, when determined as above explained, may be divided into two classes, primary and secondary. To the former class belong all those roots, the originals of which, though sometimes more or less disguised by subsequent phonetic modifications, exist in Sanskrit. Secondary roots are those, which have no Sanskrit original, though their origin can be traced to Sanskrit elements. Thus the Hindí root *khá* "eat" is a primary one; for its original is the Sanskrit root *khád*; but the Hindí root *paiṭh* "enter" is secondary; for there is no Sanskrit root *pravishṭ*, though there is a Sanskrit participle *pravishṭa* "entered" (of the root *pra-viṣ*), from which it is derived.

Among the primary roots there are a few which have suffered no phonetic modification. Thus, the common root *chal* "walk"; W. H. *chalai*, H. H. *chale*, Skr. *chalati*, "he walks." (The E. H., however, has *charai*). But most of them have passed through some sort of phonetic

* *h* is a euphonic insertion, for the sake of assimilation to *lih-is* "he took", *lih-in* "they took".

change. These changes are of seven kinds, of which sometimes one, sometimes several have affected the same root. They are—

1. Simple *phonetic permutation*, consisting in the elision or softening of a consonant, the contraction of adjacent vowels, and the like. *E. g.*, *khá* "eat," Skr. *khád*; *chú* "leak," Skr. *chyut*;—*toṛ* "break," Skr. *troṭ* (causal of *truṭ*); *paṛ* "fall," Skr. *pat*;—*paros* "distribute," Skr. *parivesh*; *ho* "be," Skr. *bhú* (*bhava*), &c.

2. *Incorporation of the "class-suffix,"* that is, the suffix, which in Sanskrit is inserted between the root and the personal endings, and according to which Sanskrit roots are divided into ten classes. In Hindí these suffixes are incorporated with the roots. Thus, *bújh* "understand," Skr. *budh* + *ya* (*budh* IVth class); *kop* "be angry," Skr. *kup* + *ya* (*kup* IVth); *nách* "dance," Skr. *nṛit* + *ya* (*nṛit* IVth); *sun* "hear," Skr. *śri* + *nu* (*śru* Vth); *bhanj* "break," Skr. *bhanaj* (*bhanj* VIIth); *ján* "know," Skr. *já* + *ná* (*jñá* IXth), &c.

3. *Incorporation of the passive suffix ya.* Thus, *lag* "belong," Skr. *lag* + *ya*; *sích* "irrigate," Skr. *sich-ya*; *de* "give," Skr. *dí* + *ya* (*dá*), &c.

4. *Change of "class."* In Sanskrit all roots are divided into ten classes, partly according to the various suffixes which some take before the personal endings in conjugation, partly according to internal phonetic changes which some undergo. The simplest roots are those of the VIth class; they are not subject to any internal change, but merely add the suffix *a*. In Hindí all roots alike are reduced to the simple form of the VIth class. This is done *(a)* by sometimes substituting the suffix *ă* of the VIth class, for another suffix; or *(b)* by changing the final vowels of other class-suffixes (*u* in the Vth and VIIIth classes, *á* in the IXth class) to *a*. Thus *(a) páva* "obtain" (VIth), Skr. *práp* + *nu* (Vth; as if it were *práp* + *a* VIth); *mánga* "ask" (VIth), Skr. *márg* + *aya* (Xth); again *(b) kara* "do" (VIth), Skr. *kar-u* (VIIIth, *kṛi*); *jána* "know" (VIth), Skr. *já* + *ná* (IXth, *jñá*). That is, the Hindí roots *páv*, *máng* (मॉग), *kar*, *ján*, all of the VIth class, correspond to the Sanskrit roots *práp*, *márg*, *kṛi*, *jñá*, of the Vth, Xth, VIIIth and IXth classes respectively, &c.

5. *Change of "voice."* Some Hindí roots are derived from the passive base of a Sanskrit root. Thus, *bhaj* "break" (active), Skr. *bhaj* + *ya* "be broken" (passive of *bhanj*); de "give," Skr. *dí-ya* "be given" (*dá*); *sak* "can," Skr. *sak* + *ya* (*sak*); *bik* "sell" (act. intrans.), Skr. *vikri-ya* (*vikrí*), &c.

6. *Change of tense.* Some Hindí roots are derived from the future base of a Sanskrit root. Thus *dekh* "see", Skr. *drakshya* (future of *dṛiś*); (old H.) *nakh* or *naṅkh* "destroy" or "throw away", Skr. *naṅkshya* (future of *naś*); (old H.) *krakh* "draw", Skr. *krakshya* (future of *kṛish*); *khech* or *khaich* "draw," Skr. *krakshya* (future of *kṛish*).

7. *Addition of the pleonastic suffix api.* Thus *suháv* "please," Skr. *sukh* (as if it were *sukhápi*). In causal roots this is the universal rule; *e. g.*, *karáv* (or shortened *karí*) "cause to do," as if it were derived from a Sanskrit root *karápi* (instead of *kárí*).

It will be observed that the laws 2 and 4, and again 3 and 5 are closely connected.

The preservation of a final single consonant (especially a hard consonant) in a Hindí root is a sure sign of its having been affected by the 3rd or 5th law. The final *g* of such a very common root as *lag* would not have been able to escape elision during its passage through Prákrit, unless it had been protected by another consonant following it; Skr. *lagati* "he belongs" would become Pr. *laaï*, H. *lai*; but Skr. *lagyate* is Pr. *laggaï*, H. *lagai* or *lage*.*

The termination *aya* of Sanskrit roots (or rather bases) of the Xth class and of causals is contracted in Prákrit to *e*. This *e* is changed to *a* in Hindí, by the 4th law. Thus Skr. *márgaya* "ask" is Pr. *magge*, H. *mánga* (माँग); Skr. *troṭaya* "break" is Pr. *toḍe*, H. *toṛa*. On the same principle the Skr. *vikríya* "sell" (pass.), which in Pr. becomes *vikke*, is H. *bika*; thus Skr. *vikríyate* "it sells," Pr. *vikkeï*, H. *bikai* or (contracted) *bike*.

Secondary roots may be divided into three sorts, according to the manner of their derivation; whence they may be called derivative, denominative and compound roots.

1. *Derivative roots* are those which are obtained by the *shortening of a radical vowel*. *E. g.*, *nah* "flow" from *nahá* "bathe", Skr. *snú*. It will be observed that this process is the exact reverse of the well-known method by which Causals are formed in Sanskrit. These are made by *lengthening a radical vowel*; *e. g.*, from the simple root *kar* "do" Sanskrit forms the causal root *kárí* "cause to do," for which, by the 7th law, Hindí places *karáv* or *karí*. Now, mistaking *nahá*, which really is a simple root, to be a causal root (as if it meant "cause to flow"), Hindí re-derives from it a simple root *nah*; the pair of roots *nahá* and *nah* being, in outward appearance, exactly like the pair *karí* and *kar*.

2. *Denominative roots* are made by treating nouns, as if they were roots. The nouns which may be treated in this way are either substantives or participles. To the former class belong such roots as *jam* "germinate," derived from the Sanskrit substantive *janma* "birth" (of the Skr. root *jan* "be born"). Of the other kind are *paiṭh* "enter," derived from the

* This process is expressly mentioned by Prákrit Grammarians, in the case of a few roots; as Pr. *rajjhaï* (or *rubbhaï*) act. "he hinders" as well as pass. "he is hindered," from Skr. pass. *rudhyate* "he is hindered," while the Skr. act. is *runaddhi* (VIIth cl.); see H. C. 4, 218, 245, 248. But it clearly occurred in more cases than they recognized; thus, in all those cases enumerated in H. C. 4, 230. The case of the Hindí root *bhaj* "break" is exactly similar. See also S. Goldschmidt in J. G. O. Soc., Vol. XXIX, p. 492, and Weber *Saptaṣataka*, p. 64.

Sanskrit participle *pravishṭa* "entered" (of the Skr. root *pra-viṣ* "enter"); *baiṭh* "sit" and *piṭh* "beat", derived respectively from the Sanskrit participles *upavishṭa* "sitting" and *pishṭa* "beaten" (of the Skr. roots *upaviṣ* and *pish*).*

3. *Compound roots* consist of the Sanskrit root *kṛi* "do" or "make," and some noun governed by it in the accusative case; in fact, they represent *phrases* in a contracted and much corrupted state. They can easily be recognized by their terminal consonant *k*, which alone remains of their original radical element *kṛi*. Thus *chuk* "cease" is derived from *chyut* + *kṛi*, which is a compound of the Sanskrit noun *chyut* "flowing away" and *kṛi* "make;" *e. g.*, the Skr. 3rd pers. sing. pres. *chyut-kríyate*, lit., "he is made a flowing away," is Pr. *chukkei*, H. *chukai* (or *chuke*) "he ceases." Similarly *ruk* "stop" or "be hindered" comes from *rut* + *kṛi*, *i. e.*, from the Sanskrit noun *rudh* "hindrance" and root *kṛi* "make;" again *kasak* "be pained" or "suffer pain" from *kasham* + *kṛi*, *i. e.*, from the Skr. noun *kasha* "pain" + *kṛi* "make." It is probable, I think, that the Prákrit termination (3rd sing. pres.) *kei*, Hindi *kai* or *ke*, is phonetically derived from the Sanskrit passive *kríyate* "he is made," Skr. *rut karoti* would mean "he makes a hindrance"; this phrase, being treated as a compound word, would form the passive *rutkríyate*,† "he is made a hindrance" or "he is hindered," whence would regularly arise the Prákrit *rukkei*, and the Hindí *rukkai* or *rukke* "he is hindered." Many of these compound roots are intransitive, which would naturally agree with their derivation from a Sanskrit passive root or base. Others which are transitive could, however, be no less easily derived in the same way, by the aid of the fifth of the above-mentioned laws, the "change of voice."

By far the largest number of Hindí roots can be brought under one or the other of the above-mentioned classes. Still there remains a small number of roots, the derivation of which, as yet, cannot be satisfactorily explained; *e. g.*, *ḍho* "carry," *lauṭ* "return." Even these, further research will probably show to belong to one of the two great classes.

The root *dekh* claims some special consideration on account of the controversy regarding its origin to which it has given rise. Various

* Beames in his Comp. Grammar, Vol. III, p. 37 (footnote) says about me that "he discussed this as if it was his own discovery in Indian Antiquary, Vol. I, p. 357." The word "if" is superfluous. The fact is, my article appeared in the December number of that Journal in 1872, and was written some months previously. Beames' Ist Vol. appeared towards the end of that year, and I did not receive it till after some time in 1873; so that when I wrote the article, it was impossible for me to know, that my views had been anticipated by Beames; though, indeed, it may be questioned, whose the merit of the first discovery is, if such a matter can be dignified by that name. Moreover my theory has a much wider application than Beames', as it includes nouns as well as participles.

† A mongrel form, no doubt, but nothing unusual in colloquial speech.

theories have been put forward,* among which that of Childers is now probably more generally accepted than any other. Stated briefly, his theory, as first applied to the Pali root-form *dakkh*, is that this root is derived from the Sanskrit future base *drakshya* (Skr. *drakshyati* = Páli *dakkhati*), its original future meaning having been forgotten in later times†. The theory, if true, must, of course, equally apply to the root in its Prákrit and Gauḍian form *dekh*. In this form, however, it can hardly be directly connected with the future base. But there is, both in Prákrit and Gauḍian, another very common root *pekh*, also meaning "see". It appears to me most probable that the original form *dakh* was in course of time changed to *dekh*, in order to assimilate it to *pekh*.‡ The formation of such, more or less unintentional, assimilations is quite in keeping with the genius of vernacular languages. There are some very striking instances in Hindí. For example there is in E. Hindí the pair of roots *de* "give", and *le* "take", representing the Sanskrit roots *dá* and *labh*. The 3rd singular present are *dey*, *ley*, Pr. *deï*, *leï*; here *ley* and *leï* "he takes" are formed in assimilation to, or after the analogy of *dey* and *deï* "he gives". Prákrit has also the regular form *lahaï* "he takes", from Skr. *labhate*. Again the E. Hindí has the past participles *dihal* "given", *lihal* "taken"; here *dihal* is formed after the analogy of *lihal*, from Prákrit *lahida*. From the transitive pair of roots *pekh* and *dekh*, another, similarly assimilated, pair *pikh* and *dikh* is derived with, generally,§ an intransitive meaning "be seen", "appear". A more serious objection to Childers' theory, in my mind, was the fact, that the origin assigned to

* The whole subject of this controversy will be found briefly, but lucidly reviewed in Beames' Comp. Grammar, Vol. III, pp. 45, 46. He does not mention, however, the ingenious theory of the two Goldschmidts (Paul and Siegfried), who explain *dekkh* as a denominative root derived from the past participle *dṛishṭa*, by assuming the well-known modern pronunciation of ष् *sh* as ख् *kh* to have already existed in Prákrit; (see S. Goldschmidt's Prácṛtica, pp. 6—8, and P. Goldschmidt's Essay in Göttinger Nachrichten, 1874, pp. 518—520). But there is no evidence, really, of the existence of that usage in Prákrit; moreover in the modern vernaculars, ष् would not be pronounced ख्, when it stood first in a conjunct, but only when it stood singly or second in a conjunct; thus one might hear *purukh* (पुरुष) or *barkhá* (वर्षा), but not *jekhṭ* (जेष्ठ, always *jeshṭh*).

† In Kuhn's Beiträge zur vergleichenden Sprachforschung, Vol. VII, p. 450, also in a private letter to myself.

‡ Beames also was of this opinion in his Comp. Gr. Vol. I, p. 162, where he remarks: "it is perhaps worth notice that in scenic Prákrit a very frequent word for 'seeing' is *pekkh*, and that possibly the existence of this verb may have had some influence on the creation of the somewhat anomalous form *dekh*. The idea is based on the well-known fondness of the Indians for jingling words of similar sound." He now appears to have abandoned it, in Vol. III, p. 46. But it cannot be dispensed with; so far at least, as the relation of the later *dekkh* to the earlier *dakkh* is concerned.

§ In the old Hindí of Chand's Prithirája Rasau, *dikh* and *pikh* are commonly used in a transitive sense (see, *e. g.*, the verse on p. 39); also in modern Hindí occasionally.

dekh seemed to be an unique one. So far as I know, no parallel case of such a process of creation of a new root from the future base has hitherto been shown to exist. Quite lately, however, in my reading of Chand's Prithirája Rasau, preparatory to my edition of it in the Bibliotheca Indica,* I have come across two other striking instances of that process, so that I now incline to consider Childers' theory to be fully proved. For this reason, I have now† inserted it in the list of laws of formation of roots, above enumerated. Those two instances are the roots *nakkh* or *naṅkh* "destroy" or "throw away" and *krakkh* "draw" or "pull." The former occurs, *e. g.*, in the following verses:

हटकि नसवो कर नष्पै ॥ (or नष्पै) 27, 88.

i. e. "impatiently he throws away his rosary with his hand"; again

हय सार सुष्पं निसंकत नष्पं ॥ 27, 84.

i. e. "the chiefs of the cavalry he fearlessly destroyed."
The root *krakkh* occurs in the following lines:

बिना लज्ज पष्पै सचो ढुंढि पिष्पो ।
मनों डिंभरु जानिकै मीन क्रष्पो ॥

i. e. "unblushingly searching for a partner, Sachí (wife of Indra) espied him, and, like as the fish her young, so she drew him to herself."

Now the origin of these two curious roots finds a very easy explanation, by applying to them Childers' theory. The future of the root *naṣ* "perish" is in Sanskrit *naṅkshyati*, which would be Pr. *naṅkhaï* or *nakkhaï*, whence in Hindí *naṅkhai* or *nakkhai* with meaning of the present. It is to be noted, that in Hindí the meaning of the root has become transitive (by the 5th law). Similarly the Sanskrit future of the root *kṛish* "draw" is *krakshyati*, Apábhraṃśa Pr. *krakkhaï*, whence in Hindí, with meaning of present tense, *krakkhai*. It should be observed, that the rhyme in the above lines would require *krikhyau* or a root *krikh*. This may serve to illustrate the process by which assimilations of radical forms are brought about in the vernaculars.

But further there is a another well-known Hindí root, the origin of which, hitherto very puzzling, now finds an easy solution and thus serves as an additional confirmation of Childers' theory. This is the root *khech* or *khaich* or *khench* (खेंच) or *khainch* (खैंच) "draw." The Sanskrit conjunct *kṣh* may change in Prákrit to *kkh* or *chchh*; thus the Skr. root *prekṣh* "see" becomes *pekkh* or *pechchh* in Prákrit; the Sanskrit future base *drakshya*

* Three fasciculi of this Epic have been published, one of the 1st Vol. by Mr. Beames, and two of the 2nd Vol. by myself; a fourth fasciculus (3rd of Vol. II) as well as an annotated English translation of the 1st fasc. of Vol. II will appear in the course of this year.

† It is not in the list given in my Comparative Grammar, pp. 161—171.

"will see" becomes *dakkha* or *dachchha* in Prákrit (see H. C. 3, 171).* Similarly the Sanskrit future base *krakshya* or *karkshya* would, in Prákrit, become *kakkha* or *kachchha;* and the Sanskrit compound future base *ákarkshya* (of root *á* + *kṛish* "draw") would become *ákkha* or *áachchha*. With the insertion of the usual euphonic *y*, the latter would become *áyachchha*. The Prákrit 3rd singular future accordingly might be *áyachchhaï* or (with the not unusual nasalization instead of the reduplication of a consonant) *áyañchhaï;* and, assuming Childers' theory to be true, this form might occur as a present, equivalent to the Sanskrit *karshati*. Now what I have thus constructed theoretically, is an actual fact, as testified by Hema Chandra in his Grammar (4, 187). He gives the following forms *áyañchhaï, ayañchhaï, áiñchhaï*† as Prákrit equivalents of the Skr. *karshati*. The last form *áiñchhaï* (आइंछइ) has arisen by contracting *ya* into *i*, and is that form which has immediately passed into Hindí, with this difference only, that *chh* has been disaspirated (a process not uncommon in the modern vernaculars). Hindí has *aiṇchai* or *eṇchai* (ऐंचै or ऍंचै). Now to return to *khech* and its compeers; the uncompounded root *kṛish* would yield a Prákrit form *kachchhai* or *kañchhaï*, which in Hindí, by transferring the lost aspiration of *chh* to *k* and by assimilation to *aiṇchai* and *eṇchai*, would result in the modern forms *khaiṇchai* or *kheṇchai* (खैंचै or खेंचै), or without nasalization, *khaichai* and *khechai*. It will be observed that the later forms *kheṇchai* or *khaiṇchai* are related to what would be the earlier forms *khañchaï* or *kañchhaï*, just as the modern *dekhai* and Prákrit *dekkhaï* are to the Páli *dakkhati*.

There are two other roots which also deserve a special word. One is the root *hokh* "be" or "become." It is an equivalent of the commoner root *ho* by the side of which it is very commonly used in Eastern Hindí. In Western Hindí, I believe, it is unknown. It is regularly conjugated, through all tenses. Its origin is obscure. I am inclined to look upon it as formed by the same (practically pleonastic) suffix *sk* which also occurs in such roots as *achchh* "be", *gachchh* "go", yachchh "hold", the element *sk* would change in Prákrit either to *kkh* or to *chchh;* so that *bhúsk* (or *bhavask*) would become Pr. *hokkh*, H. *hokh*, just as *ásk* (of *ás*) becomes Pr. *achchh*, H. *achh*, or *gask* (of *gam*) becomes Pr. *gachchh*. Possibly—though I do not think it, probable—the origin of *dekh* might be accounted for in a similar way.

* See also footnote on page 49. The Prákrit word *sarichchha* "similar" exhibits the root-form *dichcha*, which is to *dekkh* (or *dikkh*), as *pechchh* is to *pekkh*. On the other hand its Sanskrit equivalent *sadṛiksha* exhibits the Prákrit root *dekh* or *dichh* in its Sanskrit dress *dṛiksh*, and is, I believe, the only instance of the admission of that mongrel Prákrit root into Sanskrit.

† The MS. readings vary. H. C. also gives the forms *anachchhaï* and *ñachhaï;* in the former the nasal has been transferred to fill up the hiatus, in the latter *ái* is contracted into *a*.

The other is the still more common root *áv* (or H. H. *á*) "come." Its origin has, I think, not yet been satisfactorily explained. One would naturally connect it with the Skr. root *á-yá*, from which, clearly the Maráthi root *ye* "come" is derived. But this does not explain the terminal consonant *v* in the Hindí *áv*. Now it is a curious fact, that the root *áv* imitates, in every respect, the conjugational forms of the root *páv* (Skr. *práp* = *pra-áp*), instead of those of the root *já* "go" (Skr. *yá*) which one would expect it to follow. Thus, present participle E. H. *ávat* or W. H. *ávatu* "coming," E. H. *pávat* or W. H. *pávatu** "obtaining," but E. H. *ját* or W. H. *játu* "going;" past participle E. H. *ãïl* or *áyal* or *ává*, W. H. *áyau* "come," E. H. *pãïl* or *páyal* or *pává*, W. H. *páyau* "obtained," but E. H. *gãïl* or *gayal* or *gayá*, W. H. *gayau* "gone;" 3rd sing. present H. *ávai*, H. H. *áve* "he comes," H. *pávai*, H. H. *páve* "he obtains," but H. *jáy*, H. H. *jáe* "he goes." I incline, therefore, to think that there is here another instance of the, already noticed, tendency of the Indian Vernaculars to assimilate verbal forms, so that the *v* in *áv* is due to the influence of *páv*; an influence, natural enough, when it is remembered that *v*, equally with *y*, is often inserted between two adjacent vowels for the sake of euphony.† This assimilation is a very old one. There are traces of it in Prákrit as well as in the Gipsy dialects. In Prákrit there is the 3rd sing. pres. *áveï*,‡ and shortened *áväï* (H. C. 4, 367) "he comes." The regular Prákrit form would be *áäï* or shortened *aäï* (see H. C. 4, 240); but just as there is *uṭṭheï* or shortened *uṭṭhaï* (H. C. 4, 17) for *uṭṭháäi* or *uṭṭhái* (see Vr. 8, 25) "he stands up" (of root *ut-sthá*), so there might be *áeï* or *áaï* (of root *á-yá*), from which, by the insertion of the connecting consonant *v*, there would arise *áveï* and *áväï*.§

The following List of Hindí Roots is arranged alphabetically, in two parts. Part I contains primary roots, while Part II consists of secondary roots.

* *Páyatu* in Kellogg's Hindi Grammar, p. 202, § 377, is a misprint.

† This influence of *páv* even intrudes occasionally into the conjugation of *já* "go"; thus the E. H. has sometimes *jává* "gone," like *ává*, *pává*; and the 3rd sing. pres. *jáve* is rather common in H. H. beside *jáe* or *jáye*.

‡ This form is quoted by Dr. R. Mitra from the Pingala in the Vocabulary appended to his edition of the Sankshipta-sára. I have not been able to verify it; but the form is not intrinsically improbable.

§ It is just possible to connect *áv* with the Skr. root *api-i*; thus 3rd sing. *apyeti* Pr. *appei* or *ápei* or *áveï* (cf. *kádum* "to do" for *kattum*). H. C. 4, 400 seems to refer it to Skr. *á-pad* (or better *á-pat ?*). The Bangáli uses an altogether different root, *aïs* or *ás*. Beames, in his Comparative Grammar (III, pp. 44, 45) rightly refers this root, as well as the Sindhí *ach*, to the Skr. root *á-gachh* (of *á-gam*). Disaspiration of an aspirate and pronunciation of *chh* as *s* are not uncommon in the Indian vernaculars (see my Comparative Grammar, §§ 11, 145, exc. 2). The root *ágachh* would become in Pr. *áchh* (see Delius, *Radices Praecriticae*, pp. 69, 70) or *áyachh*; by contraction in Bengáli, the former would become *ás* (for *áchh*), the latter *áis* (for *áichh*). The root *ais* might, however, be also referred to the Sanskrit root *á-viś*.

PART I.—*Primary Roots.**

1 अट् *roam* = Skr. अट्, Passive अट्यते (with active sense), Pr. अट्टइ (H. C. 4, 230), H. अटै.

2 अनुहर् *resemble* = Skr. अनु + हृ, I. cl. अनुहरति, Pr. अणुहरइ (H. C. 4, 259 = Skr. सदृशीभवति), E. H. अनुहरै.

3 आव् *come*, see introductory remarks, p. 41.

4 आहर् *feed* = Skr. आ-हृ, I. cl. आहरति, Pr. आहरइ (H. C. 4, 259 = Skr. खादति), E. H. आहरै.

5 उखाड़् *pluck up* = Skr. उत् लुप्, I. cl. उत्कर्षति, Pr. उक्कड्ढइ (H. C. 4, 187), H. उखाड़ै (with transfer of aspiration, as in खैंचै, see p. 40 and my Comp. Gramm. § 132); see No. 28.

6 उघाड़् *reveal* = Skr. उद्-घट्, X. cl. उद्घाटयति, Pr. उग्घाडेइ or VI. cl. उग्घाडइ (H. C. 4, 33), H. उघाड़ै.

7 उठ् *rise* = Skr. उत्-स्था, Passive उत्थीयते (with active sense), Pr. उट्ठेइ (cf. E. M. p. 27 and Ls. p. 345, also उत्थेइ) or VI. cl. उट्ठइ (H. C. 4, 17), H. उठै In Pr. also VI. cl. उट्ठाअइ or contr. उट्ठाइ (Vr. 8, 26), in H. *deest*.

8 उड़् *fly* = Skr. उद्-डी, IV. cl. उड्डीयते, Pr. उड्डेइ (Cw. p. 99, Spt. v. 223) or VI. cl. उड्डइ, H उड़ै.

9 उतर् *descend* = Skr. उत्-तॄ, I. cl. उत्तरति, Pr. उत्तरइ (H. C. 4, 339), H. उतरै.

10 उथल् intr. *upset, come off from, come down* = Skr. उत्-थल्, I. cl. उत्-थलति (उच्छलति), Pr. उत्थल्लइ (H. C. 4, 174), H. उथलै.

11 उथार् or उथाल् tr. *upset, take down* = Skr. उत्-थल्, Causal उत्-थालयति, Pr. उत्थालेइ or VI. cl. उत्थालइ, H. उत्थालै or उथारै.

12 उपज् *grow up* = Skr. उत्-पद्, IV. cl. उत्पद्यते, Pr. उप्पज्जइ (cf. H. C. 3, 142), H. उपजै.

13 उबल् *boil* = Skr. उद्-वल्, I. cl. उज्वलति, Pr. उव्वलइ, H. उबलै; cf. root वल.

14 उबार् *keep in reserve* = Skr. उद्-वृ, Causal उद्वारयति, Pr. उव्वारेइ or VI. cl. उव्वारइ, H. उबारै.

15 उभार् *raise up, excite* = Skr. उद्-भृ, Causal उद्भारयति, Pr. उब्भारेइ or VI. cl उब्भारइ, H. उभारै.

16 उरह् or उलह् *grow up*, also *reprove* = Skr. उद्-लभ्, I. cl. उल्लभते, Pr. उल्लहइ (T. V. 3, 1. 133 = निस्सरति, H. C. 4, 259 has उल्लुहइ), E. H. उरहै, W. H. उलहै. In the sense "reprove" perhaps connected with उलघ्?

17 उहर् *subside* = Skr. अव-हृ, I. cl. अवतरति, Pr. ओहरइ (H. C. 4, 85 ओअरइ, v. l. अहरइ (with euphonic ह्), H. उहरै.

18 ऊँघ् *be drowsy* = Skr. ? , Pr. उंघइ (H. C. 4, 12 = निद्रायति), H. ऊँघै.

* See List of Abbreviations at the end of this article.

19 ऊभ् *be excited, raised up* = Skr. उद्-भू, I. cl. उद्भवति, Pr. उब्भवइ (Vr. 8, 3) or उब्भइ (cf. भंति for भवंति H. C. 4, 365), H. ऊभै; or denom. from ऊर्ध्व, Pr. उब्भ, cf. H. C. 2, 59.

20 ओट् see secondary roots.

21 ओट् *burn* = Skr. अव-कुट्, IV. cl. अवकुट्यति, Pr. ओउट्टइ, H. ओटै.

22 ओस *rot* = Skr. अव-सद्, I. cl. अवसति, Pr. अवसइ or ओसइ, H. ओसै (for ओउसै).

23 कर् *do* = Skr. कृ, VIII. cl. करोति, vedic also I. cl. करति, Pr. करइ (Vr. 8, 13), H. करै. In Pr. also X. cl. करेइ (H. C. 4, 337); Vedic also V. cl. कृणोति, Pr. कुणइ (Vr. 8, 13), *deest* in H.

24 कस् *test* = Skr. कष्, I. cl. कषति, Pr. कसइ, H. कसै.

25 कस् *tighten* = Skr. कृष्, I. cl. कर्षति, but also VI. cl. कृषति, whence Pr. कसइ, H. कसै.

26 कह् *say* = Skr. कथ्, X. cl. कथयति, Pr. कहेइ (Spt. v. 35) or VI. cl. कहइ (H. C. 4, 2. Cw. p. 99), H. कहै.

27 काट् *cut* = Skr. कृत्, Causal कर्तयति, Pr. कट्टेइ or VI. cl. कट्टइ, (cf. 1. sg. कट्टउं H. C. 4, 385), H. काटै.

28 काढ् *draw* see secondary roots.

29 काँप् or कप् *tremble* = Skr. कंप्, I. cl. कम्पति, Pr. कंपइ (H. C. 1, 30), H. काँपै or कपै.

30 किन् or कीन् *buy* = Skr. क्री, IX. cl. क्रीणाति, Pr. किणइ (Vr. 8, 30) or किणइ (Dl. p. 22), H. किनै or कीनै.

31 कूट् *pound* = Skr. कुट्, X. cl. कुट्टयति, Pr. कुट्टेइ or VI. cl. कुट्टइ, H. कूटै.

32 कूद् or कूद् *jump* = Skr. स्कुंद् (or स्कद्), I. cl. स्कुंदते, Pr. कुंदइ, H. कूँदै or कूदै.

33 कोड् or कोर् *scrape, dig* = Skr. कुट्, X. cl. कोटयते, Pr. कोडेइ or कोडइ, W. H. कोड़ै or E. H. कोरै.

34 कोप् *be angry* = Skr. कुप्, IV. cl. कुप्यति, Pr. कुप्पइ (H. C. 4, 230), H. कोपै.

35 खप् *be expended, sold* = Skr. क्षप् (X. cl. or Causal of क्षि), Passive क्षप्यते, Pr. खप्पइ, H. खपै.

36 खा *eat* = Skr खाद्, I. cl. खादति, Pr. खाअइ or (contracted) खाइ (H. C. 4, 228), H. खाय्.*

37 खाँस् *cough* = Skr. कास्, I. cl. कासते, Pr. कासइ or खासइ, (cf. H. C. 1, 181, खासिअं = कासितं), H. खाँसै.

38 खिल *be delighted, flower* = Skr. क्रीड्, Pass. क्रीड्यते, Pr. खिड्डइ or खिअइ (cf. H. C. 4, 168 खेड्ड and 4, 382 खेअ), H. खिलै.

* In Prákrit also the Passive खाइयते is used, apparently in an active sense; e. g. खज्जंति "they eat" (Dl. p. 54, quoted from the Mrchchhakatika; R. M. p. 87, seemingly quoting the same, gives खज्जदि).

39 खोज or खोझ *be vexed* = Skr. खिद्, VI. cl. खिन्दति; but also VII. cl. खिन्ते or IV. cl. खिद्यते, Pr. खिज्जइ (H. C. 4, 224), H. खीजै or (corrupted) खोझै.

40 खुल् *be opened* or *open* = Skr. खुड्, Passive खुड्यते, Pr. खुडुइ or खुल्लइ, H खुलै. See Nos. 41, 44.*

41 खूट् *pluck* = Skr. क्षोट, Passive क्षोट्यते (actively), Pr. खुडइ (H. C. 4, 116, said to be a substitute for Skr. तोडते of root तुड्), H. खूट.

42 खेल *play* = Skr. क्रीड् (cp. कील् and खेल्), I. cl क्रीडति, Pr. खेडुइ (H. C. 4, 188) or खेल्लइ (H. C. 4, 382), H. खेलै. (Pr. also कील Dl. p. 47).

43 खो *throw away*, *lose* = Skr. क्षिप्, VI. cl. क्षिपति, Pr. खिवइ, H. खोय् (with ओ for इव, see my Comp. Grammar, § 122).

44 खोल् *open* = Skr. खुड् *divide*, X. cl. खोडयति, Pr. खोडेइ or VI. cl. खोडइ or खोलइ, H. खोलै. See Nos. 40, 41.

45 गठ *tie* = Skr. ग्रंथ्, IX. cl. ग्रथ्नाति, also I. cl. ग्रन्थति, Pr. गंठइ (H. C. 4 120), H. गठै.

46 गढ़ or गड़् *form*, *grave* = Skr. घट्, I. cl. घटते, Pr. गढइ (H. C. 4, 112), H. गढ़ै or गड़ै. See Nos. 54, 59.

47 गढ़ाव् *form* = Skr. घट्, Caus. घाटयति, Pr. गढावेइ or गढावइ (H. C. 4 340), H. गढ़ावै.

48 गन् or गिन् *count* = Skr. गण्, X. cl. गणयति, Pr. गणेइ (S. B. 11, 27) or VI. cl. गणइ (H. C. 4, 358), H. गनै or (corr.) गिनै (see my Comp Grammar § 35, note).

49 गम् *be spent* = Skr. गम्, Pass. गम्यते, Pr. गम्मइ (Vr. 7, 9. 8, 58) H. गमै.

50 गरियाव् or गलियाव् *to abuse* = Skr. गर्ह् or गल्ह्, X. cl. गर्हयति, Pr. गरिहावइ (cf. H. C. 2, 104) or गलिहावइ, E. H. गरियावै for गरिहावै.

51 गल् *melt* = Skr. गल्, I. cl. गलति, Pr. गलइ (H. C. 4, 418), H. गलै.

52 गह् *seize* = Skr. ग्रह्, IX. cl. गृह्णाति, Pr. VI. cl गेण्हइ (Vr. 8, 15) or गंहइ (T. V. 2, 4. 157), H. गहै.

53 गा *sing* = Skr. गै, I. cl. गायति, Pr. गाअइ or (contr.) गाइ (Vr. 8, 26) H. गाय्.

54 गाड़् or गाड़् or E. H. गार्ह् *form*; see secondary roots.

55 गिर् *fall* = Skr. गॄ, VI. cl. गिरति, Pr. गिरइ, H. गिरै.

56 गुह *thread* = Sk. गुफ्, VI. cl. गुफति. Pr. गुहइ (H. C. 1, 236), H. गुहै.

57 गोच् *catch* = Skr. गुच् (or गुच), I. cl. गुचति, Pr. गुंचइ, H. गोचै.

58 घट् *decline* = Skr. घट् *depress*, Passive घट्यते, Pr. घटइ, H. घटै.

59 घड़् *form*, *happen* = Skr. घट्, I. cl. घटते, Pr. घडइ (H. C. 4, 11 H. घड़. See Nos. 46, 54.

* The roots खुल्, खोल्, खूट् are all connected with one another and with the Sanskrit roots क्षोट्, खोट्, खोड्, खोर्, खोल्, खुण्ड्, खुड्, खुर्, छुर्, which all mean 1, "limp," 2, "divide" or "break." The original form, apparently, is क्षोट् or क्षर्, or rather क्षुट्.

60 घस् or घिस् *rub, be worn away* = Skr. घृष्, I. cl. घर्षति, Pr. VI. cl. घसइ (= घृषति) or घिसइ (H. C. 4, 204, where it is said to be a substitute of ग्रसति), H. घसै or घिसै.

61 घाल् *throw, destroy, mix* = Skr. घट्, I. cl. घटते, Pr. घडइ or घलइ (H. C. 4, 334. T. V. 3, 4. 6 where it is said to be a substitute of क्षपति). H. घालै.

62 घुल् or घोल् *mix with a liquid, dissolve* = Skr. घूर्ण् (also घुण् and घोल्), I. and VI. cl. घूर्णति (also घोलते, घुणति, घोलयति), Pr. घुलइ or घोलइ (Vr. 8, 6. H. C. 4, 117), H. घुलै or घोलै (see also Bs. III, p. 56).

63 घूम *revolve* = Skr. घूर्ण्, VI. cl. घूर्णति, Pr. घुम्मइ (H. C. 4, 117), H. घूमै (also Bs. I, 344).

64 घेर् *gather, surround* = Skr. ग्रह? ; compare H. घर *house* with Skr. गृह.

65 चढ् *mount, increase* = Skr. उत्-गद्, VI. cl. उच्छदति, Pr. (dropping उ) चड्ढइ or चडइ (T. V. 3, 1. 128), H. चढै.*

66 चप् *be abashed* = Skr. चप् *press*, Passive चप्यते, Pr. चप्पइ (see H. C. 4, 395. चंपिज्जइ, T. V. 3, 4, 65. चप्पिज्जइ), H. चपै. The transitive form is चाप् or चाँप्.

67 चर् *graze* = Skr. चर्, I. cl. चरति, Pr. चरइ, H. चरै.

68 चल् or चाल् *walk* = Skr. चल्, I. cl. चलति, Pr. चलइ or चल्लइ (H. C. 4, 231), H. चलै or चालै.

69 चव् *drip* = Skr. च्यु, I. cl. च्यवते, Pr. चवइ (H. C. 4, 233), H. चवै. See No. 74.

70 चाव् *masticate* = Skr. चर्व्, I. cl. चर्वति, Pr. चव्वइ, H. चावै (see also Bs III, 40.)

71 चिंत् *think* = Skr. चिंत्, X. cl. चिन्तयति, Pr. चिंतेइ (Spt. 156, H. C. 4, 265) or चिंतइ (H. C. 4, 422), H. चिंतै.

72 चिन् *gather* = Skr. चि, V. cl. चिनोति, Pr. VI. cl. चिणइ (Vr. 8, 29. H. C. 4, 241), H. चिनै.

73 चुन् *gather, choose* = Skr. चि, V. cl. चिनोति, Pr. VI. cl. चुणइ (H. C. 4, 238), H. चुनै.

74 चू *leak* = Skr. च्युत् (or श्च्युत्), I. cl. चोतति, Pr. चोअइ or चुअइ (H. C. 2, 77), H. चूए

* उत्+गद् lit. *fall upwards*, an unusual word in Skr., but formed exactly like the common compound उत्+पत्.—The final द् of गद् becomes ड् in Pr., see H. C. 4, 130 भडइ and Vr. 8, 51. H. C. 4, 219 रुडइ. The initial उ is dropped, and the aspiration of ढ् transferred to ड् or lost altogether, just as in the root चाह *desire*, from उच्चाह = उत्-साह or from इच्छा (see my Comp. Grammar § 132). In old H. the root is चढ्; M. has both चढ् and चड्; but G., S. and B. have चड्, which is the form given by H. C. 4, 206 (चडइ). T. V. 3, 128 gives both चड्ढ् and चडइ.

75 चूम् *kiss* = Skr. चुंब्, I. cl. चुम्बति, Pr. चुंवइ (Vr 8, 71), H. चूमै.

76 छा *thatch* = Skr. छद्, X. cl. छादयति, Pr. छाएइ (cf. Dl. 54) or VI. cl. छाअइ (T. V. 2, 4. 110 or छायइ in H. C. 4, 21) or छाइ (by contraction; cf. Vr. 8, 26), H. छाय्.

77 छिप् or चिप् or छुप् *be hidden* = Skr. क्षि *dwell secretly*, Causal Passive चेप्यते, Pr. छेप्पइ or छिप्पइ, H. छिपै or (corr.) चिपै or छुपै.

78 छी or छीह् *touch* = Skr. स्पृश्, VI. cl. स्पृशति, Pr. छिहइ or छिवइ (H. C. 4, 182), H. छीहै or छीवै. See No. 80.*

79 छीज् *waste away* = Skr. क्षिद्, Passive क्षिद्यते, Pr. छिज्जइ (H. C. 4, 434), H. छीजै.

80 छू or छुह् *touch* = Skr. छुप्, VI. cl. छुपति, Pr. छुवइ, H. छूए or छूहै. See No. 78.

81 छूट् or छुट् *be released* = Skr. छुट् *cut*, Pass. छुट्यते, Pr. छुट्टइ, H. छूटै or छुटै.

82 छोड़् *release* = Skr. छुट् Causal छुटयति, Pr. छोडेइ or VI. cl. छोडइ, H. छोड़ै (see also Bs. III, 52).

83 जन् *give birth* = Skr. जन्, Causal जनयति, Pr. जणेइ (Spt. 75) or VI. cl. जणइ, H. जनै. Skr. also IV. cl. जायते, Pr. जाअइ (H. C. 4, 136), H. *deest*.

84 जप् *recite* = Skr जप्, I. cl. जल्पति, Pr. जंपइ (Vr. 8, 24), H. जपइ.

85 जर् *be feverish* = Skr. ज्वर्, I. cl. ज्वरति, Pr. जरइ, H. जरै.

86 जल् *burn* = Skr. ज्वल्, I. cl. ज्वलति, Pr. जलइ (H. C. 4, 365), H. जलै.

87 जा *go* = Skr. या, II. cl. याति, Pr. VI. cl. जाअइ or (contr.) जाइ (H. C. 4, 240), H. जाय्.

88 जाग् or जागर् *watch* = Skr. जागृ, II. cl. जागर्ति, Pr. I. cl. जागरइ and VI. cl. जग्गइ (H. C. 4, 80), H. जागरै or जागै.

89 जान् *know* = Skr. ज्ञा, IX. cl. जानाति, Pr. VI. cl. जाणइ (H. C. 4, 7), H. जानै, (also Bs. III, 41).

90 जी *live* = Skr. जीव्, I. cl. जीवति, Pr. जीअइ (H. C. 1, 101), H. जीऐ.

91 जुझ् *fight* = Skr. युध्, IV. cl. युध्यते, Pr. जुज्झइ (Vr. 8, 48), जुझै (also Bs. I, 328). In old H. also झुझ्.

* H. C. 4, 182 identifies the roots छिह् and छिव् with Skr. स्पृश्, for which he gives the Pr. Pass. छिप्पइ (H. C. 4, 257). The latter is merely a hardened form of छिव्वइ, which would be the regular Pass. of छिवइ or rather of छिहइ. Now Skr. स्पृश् = Pr. छिह् or, on account of labial प्, = छुह् (see No. 80); again in Pr., श्च = भ्य = झ्झ = व्व. Hence Skr. स्पृश्यते = Pr. *छिव्वइ = *छिव्वइ = छिप्पइ. It follows that the radical forms छिव् and छुव् (H. छी and छू) are *derivative* roots, made from the Passives छिव्य and छुव्य, and that the Skr. root छुप् is merely the Pr. root छुव in a Skr. dress (cf. Pr. पउप्पइ &c., and see S. Goldschmidt in J. G. O. S. 29, 493).

92 जुट् *be joined* = Skr. जुट्, Passive जुट्यते, Pr. जुडइ, H. जुटै; a very old secondary denominative root of युक्त p. p. of Skr. root युज्.

93 जोड् *join* = Skr. जुट्, X. cl. जोटयति, Pr. जोडेइ or VI. cl. जोडइ, H. जोड़ै.

94 झट् *argue, dispute* = Skr. झट्, I. cl. झटति, Pr. झडइ, H. झटै. See No. 96.

95 झड् or झर् *fall off* = Skr. शद्, VI. cl. (शदति), Pr. झडइ (H. C. 4, 130 for कडइ), H. झड़ै or झरै. See No. 97.

96 झाँट् *rush about* = Skr. झट्, Passive झट्यते (used in active sense), Pr. झंटइ (H. C. 4, 161. for झडइ), H. झाँटै.*

97 झाड् *sweep off* = Skr. शद्, Causal शादयति, Pr. झाडेइ or VI. cl. झाडइ, H. झाड़ै. See No. 95.

98 झाल् *polish* = Skr. ज्वल् *shine* (?), Causal ज्वालयति, Pr. *झालेइ or VI. cl. *झालइ, H. झालै; cf. Skr. झला *brilliancy*, झलका *flame*.

99 टक् or टंक् *stitch* = Skr. टंक्, I. cl. टङ्कति, Pr. टंकइ, H. टंकै or टकै. Probably a compound root of क्त.

100 टूट् or तूट् *break* = Skr. त्रुट्, VI. cl. त्रुटति, but also IV. cl. त्रुट्यति, Pr. तुडइ (H. C. 4, 230) or टुडइ (Pingal, as quoted by R. M. p. 99), H. तूटै or टूट.

101 ठग् *cheat* = Skr. स्थग्, I. cl स्थगति, Pr. ठगइ, H. ठगै.

102 डार् or डाल् *throw away* = Skr. दृ *be scattered*, Causal दारयति, Pr. *डारेइ or VI. cl. *डारइ, H. डारै or डालै (cf. H. C. I, 217 डरो).

103 डाँस् or डास् or डस् *bite* = Skr. दंश् or दस्, I. cl. दंशति or दसति, Pr. डसइ (H. C. 1, 218) or डंसइ, H. डाँसै or डासै or डसै.

104 डोल् *swing* = Skr. दुल्, X. cl. दोलयति, Pr. डोलेइ (H. C. 4, 48) or डोलेइ (see H. C. 1, 217 डोला) or VI. cl. डोलइ, H. डोल.

105 ढक् *cover* = Skr. स्थग्, Pass. स्थग्यते (used actively), Pr. ढक्केइ, (Spt. A. 54 for ढग्गेइ) or VI. cl. ढक्कइ (H. C. 4, 21, where it

* In B. this root is confounded with झाँड् "sweep." It is closely connected with the root झट, the original meaning of which is preserved in Marāṭhī "rush violently into contact with," and in the Hindī झट् "quickly." Hence it comes to mean, on the one hand, "dispute, argue"; on the other hand, "become intermixed confusedly", "be entangled." With the latter meaning the root झट् has been received into Sanskrit; from it comes the Skr. झाट "shrub," "underwood," the H. झाट or झाड. The original meaning it has preserved in the Skr. झटिति "quickly." The root may possibly be derived (as Bs. I, 177 says) from Skr. अधि+अट्, though the sense of "roam about very much" would be expressed rather by अति + अट्. But अध्यटति or Pass. अध्यट्यते (in act. sense) would regularly give Pr. अज्झडइ or अज्झट्टइ or (by elision of अ) झडइ or झट्टइ, whence modern झटै or झाटै. In the case of the root अट्, ट् does not change to ड. (see H. C. 1, 195).

is said to be a substitute of झाड्), H. ढकै. (See Wb. p. 43, 64, 67). Perhaps compound root of स्थग्-छ.

106 ढाँस् *accuse* = Skr. ? Pr. ढंसइ (H. C. 4, 118 where it is said to be a substitute for Skr. विदत्), H. ढाँसै. Perhaps a modification of डाँस्, No. 103.

107 ढूक् *approach* = Skr. ढौक्, I. cl. ढौकते, Pr. ढुक्कइ, H. ढुकै.

108 ढूँढ् *search* = Skr. ढुंढ्, VI. cl. ढुण्ढति, Pr. ढुंढइ, H. ढूँढै.

109 तप् *burn* = Skr. तप्, I. cl. तपति, but also IV. cl. तप्यति, Pr. तप्पइ (see H. C. 4, 140 संतप्पइ), H. तपै.

110 तर् *cross* = Skr. तॄ, I. cl. तरति, Pr. तरइ (H. C. 4, 86), H. तरै.

111 ताक् *attend* = Skr. तर्क्, X. cl. तर्कयति, Pr. तक्केइ (H. C. 4, 370) or VI. cl. तक्कइ, H. ताकै

112 तान् *stretch* = Skr. तन्, Causal तानयति, Pr. ताणेइ or VI. cl. ताणइ, H. तानै.

113 तार् *save* = Skr. तॄ *cross*, Causal तारयति, Pr. तारेइ or VI. cl. तारइ, H. तारै.

114 तुल् intrans. *weigh, be weighed* = Skr. तुल्, Passive तुल्यते, Pr. तुल्लइ, H. तुलै.

115 तोड् or तोर् *break* = Skr. त्रुट् *be torn*, Causal त्रोटयति, Pr. तोडेइ or VI. cl. तोडइ (see H. C. 4, 116, where however it is given as intrans.), W. H. तोड़े or E. H. तोरै.

116 तौल् or तोल् *weigh* = Skr. तुल्. X. cl. तोलयति or I. cl. तोलति, Pr. तोलेइ or तोल्लइ (T. V. 2, 4. 97), H. तोलै or तौलै.*

117 थम् or थन् *be arrested, be supported* = Skr. स्तंभ्, I. cl. स्तभ्नते, Pr. थम्भइ, H. थमै or थन्है See my Comp. Grammar § 120.

118 थाम or थाम्ह or थाम्ब् or थँभ् *stop* = Skr. स्तंभ् *be firm*, Causal स्तम्भयति, Pr. थंभेइ or VI. cl. थंभइ, H. थाँमै, &c.

119 थोप् *pile, prop* = Skr. स्तूप्, IV. cl. स्तूप्यति, Pr. थुप्पइ, H. थोपै.

120 दब् *be pressed down, be cowed* = Skr. दम्, Passive दम्यते, Pr. दम्मइ or *दब्बइ, H. दबै (?)

121 दल् *split* = Skr. दल्, I. cl. दलति, Pr. दल्लइ (H. C. 4, 176), H. दलै.

122 दह् intrans. *burn* = Skr. दह्, I. cl. दहति, Pr. दहइ (Pingala, quoted by R. M. p. 113; H. C. 2, 218 allows only डहइ; but the root डह् does not occur in H), H. दहै.

123 दार् *split* = Skr. दॄ, Causal दारयति, Pr. दारेइ or VI. cl. दारइ, H. दारै.

* H. C. 4, 25 gives Pr. तुल्लइ; but the root तुल् in a trans. sense does not occur in H., though it is found in M. तुल् or तुळ्. In Skr. the root तुल् admits a X. cl. form तुलयति, from which the Pr. and M. trans. root तुल् is apparently derived.

124 दाह् trans. *burn* = Skr. दह्, Causal दाहयति, Pr. दाहेइ or VI. cl. दाहइ, H. दाहै, see No. 122.

125 दिस् *show* = Skr. दिश्, VI. cl. दिशति, Pr. दिसइ, H. दिसै.

126 दिस् or दीस् *to appear* = Skr. दृश् *see*, Passive दृश्यते, Pr. दिस्सइ or दीसइ (H. C. 3, 161), H. दिसै or दीसै.

127 दे *give* = Skr. दा, Passive दीयते (used actively), Pr. देइ (Cw. p. 99, H. C. 4, 238), H. देय् or दे. In Pr. also VI. cl. दइ (Spt. v. 216), H. *deest.*

128 देख् *see* = Skr. दृश्, Future द्रक्ष्यति (used in sense of present), Pr. देक्खइ (H. C. 4, 181), H. देखै. See introductory remarks.*

129 धर् *place* or *seize* = Skr. धृ, I. cl. धरति *(seize)* or धरते *(place)*, Pr. धरइ (H. C. 4, 234), H. धरै.

130 धंस् or धस *sink, be pierced, run into* = Skr. ध्वंस्, I. cl. ध्वंसते, Pr. धंसइ or धसइ (Pingala in R. M. p. 118, said to be a substitute for धावति), H. धंसै or धसै.

131 धार् *hold* = Skr. धृ, Causal धारयति, Pr. धरेइ or VI. cl. धरइ, H. धरै.

132 धो *wash* = Skr. धाव्, I. cl. धावति (or धू, VI. cl. धुवति), Pr. धोअइ (Dl. p. 77) or (with euphonic व) धोवइ, or धुअइ (Spt. v. 133, 283) or धुवइ (H. C. 4, 238), H. धोए or धोवै.

* The Skr. conjunct क्ष्य may in Pr. become क्ख or च्छ. This will explain the origin of the synonyms of देक्खइ, which are enumerated in H. C. 4, 181; viz., with क्ख are formed अवअक्खइ = Skr. अवद्रक्ष्यति (from root अव-दृश्); the same, contracted, becomes ओअक्खइ (with ओ for अव, see H. C. 1, 172); and the latter, expanded, becomes अवक्खइ (with अव् for ओ, see my Comp. Gramm. § 48). With च्छ are formed अवयच्छइ = Skr. अवद्रक्ष्यति (for अवअच्छइ, with euphonic य्, see H. C. I, 180), and निअच्छइ = Skr. निद्रक्ष्यति (from नि-दृश्). Again च्छ appears to be softened in अवयज्झइ, which is probably identical with अवयच्छइ. From the manner in which Hemachandra places पेच्छइ between निअच्छइ and अवयच्छइ, it would almost seem as if he looked upon it as a contraction of पयच्छइ = Skr. प्रद्रक्ष्यति (of प्र-दृश्). In classical Sanskrit the future of दृश् takes the irregular guṇa र (instead of अर्, see Panini VI, 1, 58); but in the ordinary speech, no doubt, both forms द्रक्ष्यति and द्रष्यति were used. It is the latter of the two, from which the Prákrit forms are derived; thus अवअक्खइ=अवद्क्खइ (not = अवद्क्खइ)=अवद्ख्यति. The alternative form of निअच्छइ would be निअक्खइ; this seems to be intended by the form णिअइ in Vr. 8, 69 (with क disaspirated for क्ख). The Pr. पासइ is regularly derived from Skr. पश्यति = Pr. पस्सइ (see Delius *Rad. Prac.*) or पासइ (H. C. 1, 45), and Pr. अवआसइ is the Skr. अवपश्यति. In Maráthi, the Pr. root पास् becomes पाह्. The Pr. पुलोएइ is derived from Skr. प्रविलोकयति (with अवि contracted to ओ, see my Comp. Gramm. § 122); and Pr. पुलएइ is probably a mere corruption of it. Of all these forms, as far as I am aware, has left any representative in modern

133 नट् *dance*, see secondary roots.

134 नव् or नौ intr. *bend, bow* = Skr. नम्, I. cl. नमति, Pr. नमइ (see H. C. 1, 183, नमिस 1. pl.) or नवइ (H. C. 4, 226), H. नवै or नौए.

135 नवाव् or निवाव् trans. *bend, fold* = Skr. नम्, Causal नमयति, Pr. नवावेइ or VI. cl. नवावइ, H. नवावै or निवावै (with इ for अ, see my Comp. Gramm. § 55).

136 नहा *bathe* = Skr स्नां, II. cl. स्नाति, Pr. IV. cl. ण्हाअइ (cf. Dl. 20) or (contr.) ण्हाइ (H. C. 4, 14), H. नहाय.

137 नाच् *dance* = Skr. नृत्, IV. cl. नृत्यति, Pr. नच्चइ (Vr. 8, 47. H. C. 4, 225), H. नाचै.

138 निकाल् or निकार् *pull out*, see secondary roots.

139 निकास् *expel* = Skr. निस्-कस्, Causal निष्कासयति, Pr. निक्कासेइ or VI. cl. निक्कासइ, H. निकासै; cf. No. 138, the Skr. root कस् being perhaps adopted from Pr. कस् for Skr. छस्.

140 निखोड़् or निखोर् *peel*; see secondary roots.

141 निखर् *be cleaned, be peeled* = Skr. नि-चर्, I. cl. निचरति, Pr. निक्खरइ, H. निखरै.

142 निखार् *clean, peel* = Skr. नि-चर् (or नि-चल्), Causal निचारयति, Pr. निक्खारेइ or VI. cl. निक्खारइ, H. निखारै.

143 निगल *swallow*; see secondary roots.

144 निथार् *to make clear* = Skr. नि-स्थल्, Causal निस्थलयति, Pr. नित्थालेइ or VI. cl. नित्थालइ, H. निथारै, applied to water, which is made clear by letting it stand still, till the impurities have settled down, and then pouring it off; hence the root has also the meaning "pour off."

145 निबड़् *be separated, be decided, be accomplished* = Skr. निर्-वट् *divide*, (X. cl. निर्वटयति), Pr. निव्वडेइ or निव्वडइ (H. C. 4, 62, where it is said to mean पृथक् स्थो वा भवति), H. निबड़ै. It is the pass. or intrans. form of No. 147. The Skr. root is transitive.

146 निबाह् or निभा *accomplish* = Skr. निस्-वह्, Causal निर्वाहयति, Pr. निव्वाहेइ or VI. cl. निव्वाहइ, H. निबाहै or निभाय् (with transferred aspiration; see my Comp. Gramm. § 132).

147 निबाड़् *separate, divide, accomplish* = Skr. निर्-वट् *divide*, Caus: निवाटयति, Pr. निव्वाडेइ or VI. cl. निव्वाडइ, H. निबाड़ै. See No. 14

148 निबेड़् *separate, divide, accomplish* = Skr. निर्-वंड, I. cl. निर्वंडते, निव्वेडइ, H. निबेड़ै (with ए for अ, see my Comp. Gramm. § 14 This is merely another form of No. 147.

149 निवार् *hinder* = Skr. नि-वृ, Causal निवारयति, Pr. निवारेइ (H. C 22) or VI. cl. निवारइ, H. निवारै.

150 निसर् *come out* = Skr. निस्-सृ, I. cl. निस्सरति, Pr. निस्सरइ (see M. p. 107; or नीसरइ H. C. 1, 93. 4, 79), H. निसर.

151 नीच् *pinch* = Skr. नि-कुंच् *contract*, VI. cl. निकुंचति, Pr. नि H. नीचै (with ई for इ उ).

152 पच् *be digested* = Skr. पच् *digest*, Passive पच्यते, Pr. पचइ, H. पचै.

153 पठाव् *send* = Skr. प्र-स्था, Causal प्रस्थापयति, Pr. पट्ठावेइ or VI. cl. पट्ठावइ (H. C. 4, 37), H. पठावै.

154 पड़् or पर् *fall* = Skr. पत्, I. cl. पतति, Pr. पडइ (Vr. 8, 51), W. H. पड़ै, E. H. परै.

155 पढ़् *read* = Skr. पठ्, I. cl. पठति, Pr. पढइ (H. C. 1, 199), H. पढ़ै.

156 परख् or परक् *examine, test* = Skr. परि-ईक्ष्, I. cl. परीक्षते, Pr. परिक्खइ, H. परखै. It also has the secondary meaning "become habituated", owing to repeated trial.

157 परच् *become acquainted* = Skr. परि-चि, Pr. VI. cl. *परिचइ, H. परचै.

158 पला or परा *run away* = Skr. पलाय्, I. cl. पलायते, Pr. पलाअइ or (contr.) पलाइ (Pingala, quoted by R. M. p. 129),* H. पलाय् or पराय्.

159 परिहर् *forsake* = Skr. परि-हृ, I. cl. परिहरति, Pr. परिहरइ (H. C. 4, 259 said to be = त्यजति), H. परिहरै.

160 परोस् *offer food* = Skr. परि-विष्, Causal परिवेषयति, Pr. परिवेसेइ or VI. cl. परिवेसइ, H परोसै (with ओ = इवे, see my Comp. Gramm. § 122).

161 पसर् *be spread* = Skr. प्र-सृ, I. cl. प्रसरति, Pr. पसरइ (H. C. 4, 77), H. पसरै.

162 पसार् *spread* = Skr. प्र-सृ, Causal प्रसारयति, Pr. पसारेइ or VI. cl. पसारइ, H. पसारै.

163 पसीज् *perspire* = Skr. प्र-स्विद्, IV. cl. प्रस्विद्यति, Pr. पसिज्जइ (see H. C. 4, 224), H. पसीजै.

164 पहज *stitch* = Skr. प्र-सिव्, IV. cl. प्रसीव्यति, Pr. *पसुज्जइ (perhaps contracted for *पसिविज्जइ), H. पहजै.

165 पहिनाव् or पिहनाव् *cause to put on, cause to dress* = Skr. पि-नह्, Causal पिनाह्यति, Pr. पिनहावेइ or VI. cl. पिनहावइ, H. पिहनावै (with transposition of न् and ह्) or पहिनावै (with transposition of इ and ह्, see my Comp. Gramm. § 133). See also Nos. 166, 167 for a similar transposition. From this root is formed the derivative root पिहन् or पहिन् *put on, dress.*

166 पहिर् *put on, dress* = Skr. परि-धा, Passive परिधीयते (with active sense), Pr. परिधेइ (see Cw. p. 99, sútra 21 धेइ) or परिधइ (see Wb. p. 59 देइ and दइ of root दा) or परिहइ, H. पहिरै (with transposition of र् and ह्, see No. 165). This root, however, might be also a derivative root from पहिराव् No. 167. In the Gujaráti form पेहर् the इ of the second syllable has modified the vowel of the first.

167 पहिराव् *cause to put on, cause to dress* = Skr. परि-धा, Causal परिधाप-

* पलाउ, I suppose, is a misprint for पलाइ.

यति, Pr. परिधावेइ or VI. cl. परिधावइ or परिहावइ, H. पहिरावै (with transposition of र् and ह्, as in Nos. 165, 166).

168 पहुँच् or पहुच् or पहुक्, *obtain, arrive* = Skr. प्र-भू, I. cl. प्रभवति, Pr. *पहुच्चइ or पहुचइ (H. C. 4, 390), H. पहुँचै or पहुचै or पहुँचै. It is formed with the pleonastic suffix क्ष्, like the root ढोख्, see introductory remarks; only in this case, क्ष changes to च्छ् and is afterwards disaspirated. Maráṭhí has पोंचंच् or पोहोंच्, where the ह of the second syllable has modified the first.

169 पाड् *let fall* = Skr. पत्, Causal पातयति, Pr. पाडेइ (H. C. 4, 22) or VI. cl. पाडइ (H. C. III, 153), H. पाड़ै.

170 पार् *accomplish* = Skr. पृ, Causal पारयति, Pr. पारेइ or VI. cl. पारइ (H. C. 4, 86), H. पारै.

171 पाल् *cherish* = Skr. पा, Causal पालयति, Pr. पालेइ or VI. cl. पालइ, H. पालै.

172 पाव् *obtain, find* = Skr. प्र-आप्, V. cl. प्राप्नोति, Pr. VI. cl. पावइ (H. C. 4, 239), H. पावै.

173 पिघल् *melt* = Skr. अपि- or पि-गल्, I. cl. अपिगलति, Pr. पिगलइ H. पिघलै? See my Comp. Gramm. § 131.

174 पी *drink* = Skr. पा, I. cl. पिबति, Pr. पिअइ (H. C. 4, 10), H. पीवै.

175 पीच् *tread down* = Skr. पिष्, Future पेक्ष्यति, (with meaning of present), Pr. पेच्छइ or पिच्छइ, H. पीचै (with disaspiration, as in खेचै, see introductory remarks, p. 40).

176 पीड् *be pained* = Skr. पीड्, I. cl. पीडते, Pr. पीडइ, H. पीड़ै.

177 पीस् *grind* = Skr. पिष्, VII. cl. पिनष्टि, Pr. X. cl. पिंसेइ or पीसेइ (cf. Ls. p. 347) or VI. cl. पिंसइ or पीसइ (H. C. 4, 185), H. पीसै.

178 पुराव् *fill, thread* = Skr. पॄ, Causal पूरयति, Pr. पुरावेइ or VI. cl. पुरावइ, H. पुरावै (or W. H. also पिरावै in the sense of *threading, stringing*).

179 पूछ् *ask* = Skr. प्रच्छ्, VI. cl. पृच्छति, Pr. पुच्छइ (H. C. 4, 97), H. पूछै.

180 पूँछ् or पोंछ् *wipe* = Skr. प्र-उंछ्, I. or VI. cl. प्रोञ्छति, Pr. पोंछइ or पुंछइ (H. C. 4, 105), H. पोंछै or पूँछै.

181 पूज् *worship* = Skr. पूज्, X. cl., but also I. cl. पूजति, Pr. पूजइ, H. पूजै.

182 पइर् or पैर् *swim* = Skr. प्र + तॄ, I. cl. प्रतरति or VI. cl. प्रतिरति, Pr. पइरइ, E. H. पइरै or W. H. पैरै.

183 पइस् or पैस् *enter* = Skr. प्र-विश्, VI. cl. प्रविशति, Pr. पविसइ (H. C. 4, 183) or पइसइ H. पइसै or पैसै.

184 पेल् *squeeze out, shove* = Skr. पीड्, I. cl. पीडते, Pr. पेल्लइ (H. C. 4, 143), H. पेलै. See No. 42, खेलै from root क्रीड्. Perhaps a denominative of पिष्ट = पेड्ड = पेल्ल = पेल्ल.

185 पोस् *nourish* = Skr. पुष्, I. cl. पोषति, Pr. पोसइ, H. पोसै.

186 फट् or फाट् *burst* = Skr. स्फट्, Passive स्फट्यते, Pr. फट्इ, H. फाटे or फटै.

187 फल् *bear fruit* = Skr. फल्, I. cl. फलति, Pr. फल्इ (Spt. 17), H. फले. Connected with roots स्फट् and पट्; see No. 189.

188 फंस् or फाँस् *stick, be ensnared* = Skr. स्पृश्, VI. cl. स्पृशति, Pr. फंसइ or फासइ (H. C. 4, 182, probably denom. of फंस or फास = स्पर्श cf. Vr. 4, 15. H. C. 2, 92), H. फंसे or फाँसै. This root is also used transitively, in the sense of "ensnare", "deceive", see H. C. 4, 129, where फंसइ is said to be a substitute of विसंवदति.

189 फाड् *cleave, split* = Skr. स्फट्, X. cl. स्फाटयति, Pr. फाडेइ or VI. cl. फाडइ. (H. C. 1, 198. 232), H. फाड़ै. Hemachandra refers it to root पट्, X cl. पाटयति.

190 फाँद् *jump* = Skr. स्पंद् *shake*, Causal स्पंदयति, Pr. फंदेइ or VI. cl. फंदइ. H. फाँदै. Observe the same transition of meaning as in No. 191. It is also used transitively, in the sense of "ensnare", "imprison", corresponding to the intransitive root फंद्, see secondary roots. H. C. 4, 127 gives फंदइ in its original sense of "shaking", "quivering" = Skr. स्पंदते; its synonym चुलुचुलइ, which H. C. also gives, still exists in H. चुलचुले or चुलथुले or चुलमुले or चुलचुलावै, &c., "he is fidgety."

191 फाल् *jump* = Skr. स्फल् *shake*, Causal स्फालयति, Pr. फालेइ or VI. cl. फालइ, H. फाले. Probably connected with root No. 189; H. C. 4, 198. 232 give फालेइ as an other form फाडेइ.

192 फिट् *be paid off, be discharged* = Skr. स्फिट्, X. cl. स्फिटयति, Pr. फिडइ (H. C. 4, 177, said to be = भंज्, "cease", "decline"), H. फिटै; cf. R. स्फट् and स्फुट्.

193 फुट् or फूट् *expand, increase, be broken, be dispersed* = Skr. स्फुट्, Passive स्फुट्यते, Pr. फुडइ (Vr. 8, 53. H. C. 4, 177, where it is said to be a substitute of भंज्, in the sense of "being broken"), H. फुटै or फूटै. See No. 194.

194 फुल् or फूल् *blossom* = Skr. स्फुट्, VI. cl. स्फुटति, Pr. फुडइ or फुडइ (Vr. 8, 53) or फुल्लइ (H. C. 4, 387 whence Skr. R. फुल् adopted), H. फूले or फूलै. See No. 193.

195 फेर् or फिर् *turn, move round* = Skr. परि + इ, II. cl. पर्येति, Pr. फेरेइ or फेरइ (with change of प to फ and of अर्य् to एर, as in पेरंतो for पर्यंतः), H. फेरै.

196 फैल् *spread, be dispersed* = Skr. स्फिट, X. cl. स्फेटयति, Pr. फेडेइ or VI. cl. फेडइ (H. C. 4, 358; in H. C. 4, 177 the simple form फिडइ is given as a substitute of भंज्) or फेलइ (whence Skr. R. फेल्), H. फैले See Nos. 189, 192, 193; the original meaning "split", hence "expand", may change either to "increase" or to "decrease", to growth or to decay.

197 फो *unfasten* = Skr. प्र-मुच्, VI. cl. प्रमुञ्चति, Pr. पमुच्चइ (cf. H. C. 4, 91), H. फोए (for पोए = पउए).

198 फोड़् *break* = Skr. स्फुट्, Causal स्फोटयति, Pr. फोडेइ (H. C. 4, 350) or VI. cl. फोडइ, H. फोड़ै.

199 बच् *go away, escape* = Skr. व्रज्, I. cl. व्रजति, Pr. वच्चइ (Vr. 8, 47), H. बचै. More likely from root वञ्च्, or from Pass. इत्यते of Skr. R. इत्.

200 बज् or बाज् *sound* = Skr. वद्, Causal Passive वाद्यते, Pr. वज्जइ (H. C. 4, 406), H. बजै or बाजै.

201 बझ् *be ensnared* = Skr. बंध्, Passive बध्यते, Pr. बज्झइ (H. C. 2, 26. 4, 247), H. बझै.

202 बट् tr. and intr. *twist, divide* = Skr. वट्, Passive वट्यते, Pr. वट्टइ, H. बटै.

203 बढ़् or E. H. बाढ़् *grow* = Skr. वृध्, I. cl. वर्धते, Pr. वड्ढइ (Vr. 8, 44), H. बढ़ै or E. H. बाढ़ै.

204 बढाव् *enlarge, complete* = Skr. वृध्, Causal वर्धयति, Pr. वड्ढावेइ or VI. cl. वड्ढावइ, H. बढावै. (T. V. 3, 1. 132 has वड्ढाविअं = समापितं).

205 बताव् *show, relate* = Skr. वृत्, Causal वर्त्तयति, Pr. वत्तावेइ or VI. cl. वत्तावइ, H. बतावै.

206 बध् *kill* = Skr. वध् (or बाध्, I. cl. बाधते), Pr. वधइ, H. बधै.

207 बन् *be made* = Skr. वन्, Passive वन्यते, Pr. वणइ, H. बनै. In Sindhí it means "*go, come*," cf. the Mágadhí वञ्जदि (H. C. 4, 294) which the Prákrit Grammarians derive from the Skr. R. व्रज् *go* or *become*.

208 बर् *marry* = Skr. वृ, V. cl. वृणोति, but also I. cl. वरति, Pr. वरइ (Vr. 8, 12), H. बरै.

209 बरिस् or बरस् *rain* = Skr. वृष्, I. cl. वर्षति, Pr. वरिसइ (Vr. 8, 11.; perhaps denom. of वर्ष), E. H. बरिसै or W. H. बरसै.

210 बल् *burn* = Skr. ज्वल्, I. cl. ज्वलति, Pr. वलइ (H. C. 4, 416 वलंति), H. बलै.

211 बस् *dwell* = Skr. वस्, I. cl. वसति, Pr. वसइ, H. बसै.

212 बह् *flow* = Skr. वह्, I. cl. वहति, Pr. वहइ (H. C. 1, 38), H. बहै. The root बहल् *glide happily, be diverted* is a passive or intrans. of a causal बहलाव् formed like पिलाव् from पीय् *drink*.

213 बाँच् *recite, read*; see secondary roots.

214 बाँछ् *wish* = Skr. वांछ्, I. cl. वाञ्छति, Pr. वंछइ (T. V. 3, 1. 133), H. बाँछ.

215 बाँध् *bind* = Skr. बंध्, IX. cl. बध्नाति, Pr. VI. cl. बंधइ (H. C. 1, 187), H. बाँधै.

216 बाल् or बार् *kindle, light* = Skr. ज्वल्, Causal ज्वालयति, Pr. वालेइ or वालइ, W. H. बालै or E. H. बारै. See No. 210.

217 बास् *perfume* = Skr. वास्, X. cl. वासयति, Pr. वासेइ or VI. cl. वासइ, H. बासै.

218 बिक् *be sold* = Skr. वि-क्री *sell*, Passive विक्रीयते, Pr. बिक्केइ or बिक्कइ, H. बिकै (see Vr. 8, 31. H. C. 4, 240, where however the form बिक्केइ is given as act. trans ; in the moderns it is intrans. or pass., and the trans. root is बेच्, cf. No 242.

219 बिगड़् or E. H. बिगर् *be at variance, be spoiled* = Skr. वि-घट्, I. cl. विघटते, Pr. बिगडइ (cf. H. C. 4, 112), H. बिगड़ै (for बिगड़ै). See No. 46.

220 बिगाड् *make discord, spoil* = Skr. वि-घट्, Causal विघाटयति, Pr. बिगाडेइ or VI. cl. बिगाडइ, H. बिगाड़ै (for बिगाड़े). See No. 54.

221 बिचार् *reflect* = Skr. वि-चर्, Causal विचारयति, Pr. बिचारेइ or VI. cl बिचारइ, H. बिचारै.

222 बिडर् *scatter* = Skr. वि-दृ, IX. cl. विदृणाति, Pr. I. cl. बिडरइ (cf. No. 102), H. बिडरै.

223 बिडार् *drive away* = Skr. वि-दृ, Causal विदारयति, Pr. बिडारेइ or VI. cl. बिडारइ, H बिडारै. See No. 102.

224 बितर् *grant* = Skr. वि-तॄ, I. cl. वितरति, Pr. बितरइ, H. बितरै.

225 बित्थार् tr. *spread* = Skr. वि-स्था, Causal विस्तारयति, Pr. बित्थारेइ or VI. cl. बित्थारइ, H. बिथारै.

226 बिराव् *mock* ; see secondary roots.

227 बिलख् or बिलक् *see, be confused* = Skr. वि-लक्ष्, X. cl. विलक्षयति, Pr. बिलक्खेइ or VI. cl. बिलक्खइ, H बिलखै or (corrupt) बिलकै.

228 बिलग् intr. *separate* = Skr. वि-लग्, Passive विलग्यते (with active sense), Pr. बिलग्गइ (cf. Vr. 8, 52), H. बिलगै.

229 बिलंग् *ascend* = Skr. वि-लंघ्, I. cl. विलङ्घति, Pr. बिलंघइ, H. बिलंगै (for बिलंघै).

230 बिलस् *be pleased* = Skr. वि-लस्, I. cl. विलसति, Pr. बिलसइ, H. बिलसै.

231 बिलाव् tr. and intr. *disperse, vanish* = Skr. वि-ली, Causal विलापयति, Pr. बिलावेइ or VI. cl. बिलावइ, H. बिलावै.

232 बिहर् *enjoy one's-self* = Skr. वि-हृ, I. cl. विहरति, Pr. बिहरइ (H. C. 4, 259 where it is said to be a substitute of Skr. क्रीडति), H. बिहरै.

233 बिहाय् or बिहा *leave, spend* = Skr. वि-हा, III. cl. विजहाति, Pr. I. cl. बिहायइ or बिहायइ or (contr.) बिहाइ, H. बिहायै or बिहाय्; cf. Vr. 8, 26.

234 बिसर् *forget* = Skr. विस्मृ, I. cl. विस्मरति, Pr. बिसरइ (cf. H. C. 4, 74), H. बिसरै.

235 बीझ् *tear, break up* = Skr. भिद्, Passive भिद्यते (used actively), Pr. भिज्जइ, H. बींझै (for भींजै, with aspiration transferred ; see my Comp. Gramm. § 132), or perhaps Skr. व्यध्, IV. cl. विध्यति, Pr. विज्झइ, H. बींझै.

236 बीत् *pass* ; see secondary roots.

237 बीन् or बिन् *choose* = Skr. व्री, IX. cl. व्रीणाति or व्रिणाति, Pr. VI. cl. बीणइ or बिणइ, H. बीनै or बिनै.

238 बुझ् *be extinguished* = Skr. वि-अव-चै, I. cl. अवचायति, Pr. वोज्झेइ or वोज्झइ (or व्०), H. बुझै. See Weber Spt p. 32.*

239 बुड् or बूड् *dive, sink* = Skr. बुड्, VI. cl. बुडति Pr. बुड्डइ (H. C. 4, 101), H. बुडै or बूडै or W. H. transposed डुबै or डूबै.

240 बुत् *be extinguished* = Skr. वि-आ-वृत् *come to an end*, I. cl. आवर्त्तते, Pr. व वत्तइ or वोत्तइ or वुत्तइ, H. बुतै. Compare H. बत्ती = वर्त्तिका *light*, lit. *wick*.

241 बुहार् *gather, sweep* = Skr. वि-अव-हृ, Causal अवहारयति, Pr. वोहारेइ or VI. cl. वोहारइ, H. बुहारै.

242 बूझ् *understand* = Skr. बुध्, IV. cl. बुध्यते, Pr. बुज्झइ (Vr. 8, 48), H. बूझै

243 बेच् *sell* = Skr. अच् *cheat*, VI. cl. विचति, Pass. अच्यते (used actively), Pr. वेच्चइ (H. C. 4, 419, T. V. 3, 3. 4, transl. प्रयच्छति?), E. H. बेच्; or perhaps Skr. वि-अति + द् *spend*, II. cl. अत्ति, Pr. वेच्चेइ or वेच्चइ?

244 बेढ् *surround*; see secondary roots.

245 बैस् or बइस् *sit* = Skr. उप-विश्, VI. cl. उपविशति, Pr. उवविसइ H. बइसै or बैसै (with loss of initial उ, see my Comp. Gramm. § 173).

246 बो *sow* = Skr. वप्, I. cl. वपति, Pr. वावइ or वोप्पइ (formed like सोवइ of स्वप्, H. C. 1, 64), H. बोए.

247 बोड् *immerse* = Skr. बुड्, Causal बोडयति, Pr. बोडेइ or VI. cl. वोडइ, H. बोडै.

248 बोलाव् or बुलाव् or बल्लाव् *call* = Skr. वद्, Causal वादयति, Pr. वोल्लावेइ or VI. cl. वोल्लावइ, H. बोलावै, &c. See No. 249.

249 बोध् *wheedle* = Skr. बुध्, Causal बोधयति, Pr. वोधेइ or VI. cl. वोधइ, H. बोधै.

250 बोल् *speak* = Skr. वद्, I. cl. वदति, Pr. वोल्लइ (H. C 4, 2.) or वोल्लइ (Cw. 99), H. बोलै. (cf. No. 245 वप् = वोव्, so वद् = वोल्).†

* The simple root चै would form Pr. झाअइ and contracted झाइ, after the analogy of ठाअइ, ठाइ from स्था, झाअइ or झाइ from ध्यै (Vr. 8, 26); this is born out by Páli झायति, and by Pr. विज्झाइ (H. C. 2, 28 = Skr. वि-ध्यायति); but in compounds the Pr. form might be °झेइ or °झइ, just like °ठेइ or °ठइ in उट्ठेइ, उट्ठइ form उत्+स्था (H. C. 4, 17); thus we should have regularly वोज्झेइ or (as o is short before a conjunct) वुज्झेइ, वुज्झइ.

† This root is usually connected with Skr. वद् by Prákrit Grammarians, see Cw. p. 99, where वोअइ or वोचइ, of root वच्, is mentioned as an analogous formation. Now the latter is derived from the passive *उच्यते (उच्यते), in an active sense, as appears from H. C. 4, 161. Similarly, I am inclined to derive वोअइ from the passive *ब्रूयते (for ब्रूयते of root ब्रू), used actively. The conjunct र्य becomes ज्ज, as in पज्जाणं = पर्याणं, सोज्जमज्जं = सौकुमार्यं (Vr. 3, 21).

251 भख् *eat, devour* = Skr. भक्ष्, I. cl. भक्षति, Pr. भक्खइ, H. भखै.

252 भज् *worship* = Skr. भज्, I. cl. भजति, Pr. भजइ, H. भजै.

253 भज् or भाज *flee* = Skr. भंज् *break*, Passive भज्यते (used actively), Pr. भज्जइ, H. भजै or भाजै.

254 भंज् *break* = Skr. भंज्, VII. cl. भनक्ति, Pr. VI. cl. भंजइ (H. C. 4, 106), H. भंजै.

255 भण् *speak* = Skr. भण्, I. cl. भणति, Pr. भणइ (H. C. 4, 239), H. भनै.

256 भर् *fill* = Skr. भृ, III. cl. बिभर्त्ति and I. cl. भरति, Pr. भरइ (cf. Spt. 288 भरंति), H. भर.

257 भव् or भौ *revolve* = Skr. भ्रम्, I. cl. भ्रमति, Pr. भमइ (H. C. 4, 161) or भवइ (cf. H. C. 4, 401), H. भवै or भौंए. See No. 134 नव् or नौ.

258 भंस् *float* = Skr. भ्रंश्, I. cl. भ्रंशते, Pr. भंसइ, H. भंसै.

259 भाल् *see* = Skr. भल्, X. cl. भालयते, Pr. भालेइ or VI. cl. भालइ, H. भालै.

260 भास् *appear* = Skr. भास्, I. cl. भासते, Pr. भासइ (H. C. 4, 203), H. भासै. Pr. has also the form भिसइ which is preserved in the Hindí root भिसल् *dazzle.*

261 भीज् *be afflicted* = Skr. भिद् *break*, Passive भिद्यते, Pr. भिज्जइ, H. भीजै. See No. 234. Or from अभि-ऋद् *afflict*, Pass. अभ्यर्द्यते, Pr. अभिज्जइ, H. भीजै (with loss of अ, see my Comp. Gramm. § 172).

262 भीज *be wet*; see secondary roots.

263 भुंज् *eat* = Skr. भुज्, VII. cl. भुनक्ति, Pr. VI. cl. भुंजइ (H. C. 4, 110), H. भुंजै.

264 भून् *fry*; see secondary roots.

265 भेड़ *close*, for बेढ् with transposed aspiration, see No. 244.

266 भेट् *meet, visit* = Skr. अभि-वट्, I. cl. अभ्यटति, Pr. अब्भट्टइ, H. भेटै (with loss of initial अ; and with ए for ट्; see my Comp. Gramm. §§ 148, 172).

267 मच *be raised up, be made, be stirred up, be excited* = Skr. मंच् or मच्, Passive मच्यते, Pr. मचइ (H. C. 4, 230 where it is referred to the Skr. root मद्), H. मचै. From it are derived many Hindí nouns, all meaning lit. "an erection", माचा or मचा or मचान or मचाला *a large bedstead* or *stage*, मचिय *a small bed, stool*, मच् *drowsiness*; also many secondary roots, as मचमच् *creak in the joints* (as a bedstead, &c.), मचक् *creak or pain in the joints*, मचकाव् *wink*, मचल् or मचलाव् *be fidgety, be perverse, feel nausea.*

268 मंज् *clean* = Skr. मृज्, II. cl. मार्ष्टि and I. cl. मज्जति, Pr. मंजइ (whence Skr. R. मंज् X. cl.), H. मंजै.

269 मढ् *cover* = Skr. मठ्; see secondary roots.

270 मन् *be propitiated* = Skr. मन्, Causal Passive मान्यते, Pr. मन्नइ, H. मनै. See No. 277.

271 मर् *die* = Skr. मृ, VI. cl. म्रियते, but Vedic also I. cl. मरति, Pr. मरइ (Vr. 8, 12), H. मरै.

272 मल् *rub* = Skr. मृद्, IX. cl. मृद्नाति Pr. VI. cl. मल्लइ (Vr. 8, 50), H. मलै.

273 मह् *churn* = Skr. मथ्, I. cl, मथति, Pr. मत्थइ (cf. Dl. 53), H. मथै.

274 माँग् *ask for* = Skr. मार्ग्, X. cl. मार्गयति and I. cl. मार्गति, Pr. मग्गइ (Spt. 71), H. मगै. Cp. Skr. R. मृग्, IV. cl. मृग्यति, which would give the Pr. मग्गइ equally well; but the denom. R. मार्ग् is the more probable source, as Pr. and Gaud. have a preference for denominative verbs.

275 माँज् *scour* = Skr. मार्ज्, X. cl. मार्जयति (or R. मृज्, X. cl. मार्जयति, see remarks on No. 274), Pr. मंजेइ or VI. cl. मंजइ, H. माँजै.

276 माड् or माड़् *rub* = Skr. मृद्, IX. cl. मृद्नाति or I. cl. मर्दति, Pr. मड्डइ (H. C. 4, 126), H. माडै or माँडै.

277 मान् *honor, heed* = Skr. मन्, Causal मानयति, Pr. माणेइ or VI. cl. माणइ, H. मानै, See No. 270.

278 माप् or नाप् *measure* = R. मा, Causal Passive माप्यते (used actively), Pr. माप्पइ, H. मापै. The form नाप is either a mere corruption of माप्, or it may be similarly derived from the Causal Passive ज्ञाप्यते (of root ज्ञा), Pr. नप्पइ, H नापै.

279 मार् *beat, kill* = Skr. मृ, Causal मारयति, Pr. मारेइ (H. C. 4, 337) or VI. cl. मारइ (H. C. 3, 153), H. मारै.

280 मिल् *meet* = Skr. मिल्, VI. cl. मिलति, Pr. मिलइ (H. C. 4, 332), H. मिलै.

281 मिस् *be pulverised* = Skr. म्रक्ष्, VI. cl. म्रक्षति, Pr. मिसइ, H. मिसै.

282 मीच् *wink* = Skr. मिष्, future मेष्यति (used in sense of present), Pr. मेच्छइ or मिच्छइ, H. मीचै or (corrupt) मीचै. See introductory remarks pp. 37—40, and No. 175.

283 मींज् or मीज् *rub* = Skr. मृज्, II. cl. मार्ष्टि or I. cl. मृज्जति, Pr. मिंजइ, H. माँजै or माजै.

284 मूँड् *shave* = Skr. मुंड्, I. cl. मुण्डति, Pr. मुंडइ (H. C. 4, 115), H. मूँडै.

285 मूस् *steal* = Skr. मूष्, I. cl. मूषति, Pr. मूसइ (T. V. 2, 4. 69), H. मूसै.

286 मोह् *allure* = Skr. मुह्, Causal मोहयति, Pr. मोहेइ or VI. cl. मोहइ, H. मोहै.

287 रख् *keep, place* = Skr. रक्ष्, I. cl. रक्षति, Pr. रक्खइ (H. C. 4, 439), H. रखै.

288 रच् intr. *be made* or tr. *make* = Skr. रच् *make*, Passive रच्यते (used actively), Pr. रचइ (cf. H. C. 4, 422, 23 रचमि. Spt. 363 रचिअ = रचित), H. रचै.

289 रम् *roam, enjoy* = Skr. रम्, I. cl. रमते, Pr. रमइ (H. C. 4, 168), H. रमै.

290 रह् *stop, remain* = Skr. रह्, Passive रह्यते Pr. रहइ, H. रहै (for रहै)*

291 राज् *be adorned* = Skr. राज or रज्, IV. cl. राजति, Pr. रज्जइ, H. राजै

292 राँध् or रौंध् *cook* = Skr. रध्, Causal रन्धयति, Pr. रंधेइ or VI. cl रंधइ, H. राँधै or (corr.) रौंधै.

293 रिस् *be vexed* = Skr. रिष्, IV. cl (or Pass.) रिष्यते, Pr. रिस्सइ, H. रिसै.

294 रुच *be agreeable* = Skr. रुच्, Passive रुच्यते. Pr. रुचइ (H. C. 4, 341), H. रुचै.

295 रुप् intr. *be fixed, stop* = Skr. रुह्, Causal Passive रोप्यते, Pr. रोप्पइ or रुप्पइ, H. रुपै.

296 रुस् or रूस् *be angry* = Skr. रुष्, IV. cl. रुष्यति, Pr. रुसइ or रूसइ (Vr. 8, 46), H. रुसै or रूसै; cf. No. 302.

297 रूंद् or रूँद् or रौंद् or रैंद् *trample on*, probably a corrupt spelling of the following, No. 298.

298 रूंध् or रूँध् or रोंध् or रौंध् *enclose, restrain* = Skr. रुध्, VII. cl. रुणद्धि, Pr. रुंधइ (Vr. 8, 49), H. रूंधै or रूँधै or रोंधै or रौंधै.

299 रेंग् *creep* = Skr. रिंग्, I. cl. रिंगति, Pr. रिंगइ or रिग्गइ (H. C. 4, 259), H. रेंगै.

300 रो *weep* = Skr. रुद्, II. cl. रोदिति, Vedic also VI. cl. रुदति. Pr. रुवइ (H. C. 4, 226. 238) or रुअइ (Spt. 311) or I. cl. रोवइ (H. C. 4, 226. 238) or रोअइ (K. I. 4, 69), H. रोवै or रोऐ.

301 रोल् *roll, plan* = Skr. लुह्, I. cl. लोलति, Pr. लोलइ, H. रोलै.† See Nos. 313, 314.

302 रोस् *be angry* = Skr. रुष्, Vedic I. cl. रोषति, Pr. रोसइ, H. रोसै; cf. No. 296.

303 लख् *see* = Skr. लक्ष, I. cl. लक्षते, Pr. लक्खइ, H. लखै.

304 लग् *be applied* = Skr. लग्, Passive लग्यते, Pr. लग्गइ (Vr. 8, 52), H. लगै.

305 लंघ् or लाँघ् *jump over* = Skr. लंघ्, I. cl. लंघति, Pr. लंघइ, H. लंघै or लाँघै.

306 लड़् or E. H. लर् *dispute, fight* = Skr. लड, X. cl. लडयति, Pr. लडेइ

* The derivation is somewhat obscure; but it can hardly be referred (as Bs. III, 40) to the Skr. root रह् which has a very different meaning "desert". The derivation from रुच is supported by the Maráthí form राह् = र.ख्. On the change of ख् to ह्, see my Comp. Gramm. § 116.

† There is a large number of Skr. roots, all closely connected in meaning; *viz.* लुट्, लुड्, रोड्, रौड्; लुट, लुड्, लुल, लोड, &c.

or VI. cl. लडद्, W. H. लड़े or E. H. लरै.

307 लस् or लास् *shine, be fit* = Skr. लस, I. cl. लसति or X. cl. लासयति, Pr. लसइ or लासइ, H. लसै or लासै.

308 लह् *find, avail, get on well* = Skr. लभ्, I. cl. लभते, Pr. लहइ (H. C. 4, 335), H. लहै.

309 लाज् *feel ashamed* = Skr. लज्ज्, I. cl. लज्जति, Pr. लज्जइ (H. C. 4, 103), H. लाजै

310 लिख् *write* = Skr. लिख्, VI. cl. लिखति, Pr. लिखइ, H. लिखै The ordinary Pr. root लिह् (H. C. 1, 187 लिहइ) does not exist in Hindí.

311 लिप् *be smeared* = Skr. लिप्, Passive लिप्यते, Pr. लिप्पइ. H. लिपै

312 लीप् or लेप् *smear* = Skr. लिप्, VI. cl. लिम्पति, Pr. लिंपइ (H. C. 4, 149), H. लीपै or लेपै. As to the change of इ to ए, see my Comp. Gramm. § 148.

313 लुड् *roll* = Skr. लुड्, VI. cl. लुडति, Pr. लुडइ, H. लुड़ै. See Nos. 301, 314, 317.

314 लुढ् *roll* = Skr. लुठ्, VI. cl. लुठति, Pr. लुढइ, H. लुढ़ै.

315 लूट् or लूठ् *rob* = Skr. लुंट् or लुंठ् I. cl. लुण्ठति or लुण्ठयति, Pr. लुंटइ or लुंठइ, H. लूटै or लूठै.

316 ले *take* = Skr. लभ्, I. cl. लभते, Pr. लहइ or लेइ (H. C. 4, 238), H. लेय् or ले. The syllable लह is contracted into ले; similarly कह *speak* is sometimes pronounced के, and सह *bear*, से.

317 लोट् *roll about* = Skr. लुट्, VI. cl. लुटति, Pr. लोट्टइ (H. C. 4, 146 in the sense "rolling about in sleep"), H. लोटै.

318 लोभ् *be enamoured* = Skr. लुभ्, IV. cl. लुभ्यति, Pr. लुब्भइ (H. C. 4, 153), H. लोभै. As to the change of उ to ओ, see my Comp. Gramm. § 148.

319 वार् *surround* = Skr. ट, Causal वारयति, Pr. वारेइ or VI. cl. वारइ, H. वारै.

320 सक् *can* = Skr. शक्, Passive शक्यते (used actively), Pr. सक्कइ (Vr. 8 52), H. सकै.

321 संघार or संहार् (or समार्) *destroy* = Skr. सम्-हृ, Causal संहारयति, Pr. संहारेइ or संघारेइ (cf. H. C. 1, 264) or VI. cl. संहारइ or संघारइ, H. संघारै or संहारै (or समारै). Or a denominative of संहार.

322 संच् *collect* = Skr. सम्-चि, Passive संचीयते (used actively), Pr. संचेइ (cf. H. C. 4, 241 उचेइ) or VI. cl. संचइ (as उट्ठइ for उट्ठेइ), H. संचै.

323 संट् or सट् *be combined* = Skr. सम्-स्था, Passive संस्थीयते (used actively), Pr. संठेइ or VI. cl. संठइ (like उट्ठेइ and उट्ठइ), H. सं or (corr.) सटै.

321 सड़् or सर् *rot* = Skr. सद् (or शद्), I. cl. सीदति, but Vedic also सदति, Pr. सडइ (H. C. 4, 219; in Vr. 8, 51 it is ascribed to शद्), W. H. सड़े or E. H. सरै.

325 सताव् *persecute, torment* = Skr. सम्-तप्, Causal सन्तापयति, Pr. संतावेइ or VI. cl. संतावइ, H. सतावै.

326 सद् *leak* = Skr. स्यंद्, I. cl. स्यन्दते, Pr. संदइ, H. सदै. As to elision of the nasal, see my Comp. Gramm. §§ 143, 146. See No. 353.

327 संभाल् or संहाल् or समाल् *sustain* = Skr. सम्-भृ, Causal सम्भारयति, Pr. संभारेइ or VI. cl. संभारइ H. संभालै, &c. Or demon. root of सम्भार.

328 समाव् *be contained* = Skr. सम्-आप्, V. cl. समाप्नोति, Pr. X. cl. समावेइ H. C. 4, 142) or VI. cl. समावइ, H. समावै See No. 172.

329 समझ् or समझ *understand* = Skr. सम्-बुध्, IV. cl. सम्बुध्यते, Pr. संबुज्झइ, E. H. समझै or W. H. समझै. See No. 242.

330 सर् *issue, be ended* = Skr. सृ, I. cl. सरति, Pr. सरइ (Vr. 8, 12), H. सरै.

331 सराह *commend* = Skr. श्लाघ, I. cl. श्लाघते, Pr. सलाहइ, (H. C. 2, 101 has सलहइ ?). H. सराहै.

332 सल *pierce* = Skr. शल् or सल, I. cl. शलति or सलति, Pr. सलइ, H सलै.

333 संवार् or सवार् or समार् *prepare* = Skr. सम्-भृ, Causal संभारयति, Pr. संवारेइ or VI. cl. संवारइ, H. संवारै, &c.

334 सह् *endure* = Skr. सह्, I. cl. सहते, Pr. सहइ (H. C. 1, 6), H. सहै.

335 सहर् *arrange* = Skr. सम् + हृ, I. cl. संहरति, Pr. संहरइ (H. C. 4, 259 = Skr. संहरोति, in H. C. 4, 82 also साहरइ), E. H. सहरै.

336 साध् *settle* = Skr. साध्, Causal साधयति, Pr. साधेइ (cf. Spt. 188 सारेइ) or VI. cl. साधइ (cf. Spt. 260 साहइ), H. साधै. The form साह् does not occur in Hindí.

337 सार् *accomplish* = Skr. सृ, Causal सारयति, Pr. सारेइ or VI. cl. सारइ H. सारै.*

338 साल् *pierce* = Skr. शृ, Causal शारयति, Pr. सारेइ or VI. cl. सारइ; H. सालै. Or from Causal of शल्, see No. 332.

339 सांस् *threaten, distress* = Skr. संस्, Causal संसयति, Pr. संसेइ or VI. cl. संसइ (H. C. 4, 197 where however it is = संसते), H. सांसै.

340 सी *sew* = Skr. सिव्, IV. cl. सीव्यति, Pr. VI. cl. सिव्वइ or सिव्भइ, H. सीऐ. H. C. 4, 230 gives सिव्भइ which would be सीवै in H., but it does not exist; there is, however, another reading सिव्वइ, H. सीवै which does exist, see No. 342.

341 सीख *learn* = Skr. शिक्ष्, I. cl. शिक्षते, Pr. सिक्खइ (cf. Spt. 353), H सीखै.

342 सोच् or सोंच or बोंच् *irrigate* = Skr. सिच्, VI. cl. सिञ्चति, Pr. सिंचइ,

* The root means also "*polish*" (by rubbing, striking); perhaps this is the सारइ mentioned by H. C. 4, 84 as equivalent to the Skr. प्रहरति,

(H. C. 4, 239) or सिञ्च् (H. C. 4, 230), H. सींचै or सींचै or (corr.) झींचै (cf. Vr. 2, 41 क्त० = सप्त०, Ls. 199.)

343 सीज *exude, sweat* = Skr सिच्, IV. cl. सिच्यति, Pr. सिज्जइ (H. C. 4, 224), H. सीजै. See also No. 344.

344 सीज् *seethe, boil, exude, sweat* = Skr. षी (or सा), Passive शीयते, Pr. सिज्जइ, H. सीजै.

345 सीज् *be received* (as money) *be liquidated* (as debt) = Skr. षि, Passive शीयते, Pr. सिज्जइ, H. सीजै.

346 सुधार् *adorn* = Skr. सु-धृ, Causal सुधारयति, Pr. सुधारेइ or VI. cl. सुधारइ, H. सुधारै.

347 सुन् *hear* = Skr. श्रु, V. cl. शृणोति, Pr. VI. cl. सुणइ (Vr. 8, 56), H. सुनै.

348 सुमर् *remember* = Skr. स्मृ, I. cl स्मरति, Pr. सुमरइ (Vr. 8, 18), H. सुमरै.

349 सुहाव् *be agreeable* = Skr. सुख्, X. cl. सुखयति Pr. सुहावेइ (Spt. 169) or VI. cl. सुहावइ, H. सुहावै.

350 सूँघ् *smell at* = Skr. सम्-घ्रा-घ्रा, I. cl. समाजिघ्रति or II. cl. समाघ्राति, Pr. समग्घेइ or VI. cl. समग्घइ, H. सूँघै.*

351 सूँज् *swell* = Skr. षि, Passive शूयते, Pr. सुज्जइ, H. सूजै.

352 सूझ् *appear* = Skr. शुध्, IV. cl शुध्यति, Pr. सुज्झइ, (cf. H. C. 4, 217), H. सूझै.

353 सेँद् *irrigate* = Skr. स्यंद्, Causal स्यन्दयति, Pr. सिंदेइ or VI. cl. सिंदइ, H. सेँदै cf. No. 326.

354 सेव् or सेच् *serve, worship* = Skr. सेव्, I. cl. सेवते, Pr. सेवइ (H. C. 4, 396), H. सेवै or सेचै (with euphonic च्, see my Comp. Gramm. § 69).

355 सोच् *regret, meditate* = Skr. शुच्, Passive शुच्यते (used actively) Pr. सुअइ, H. सोचै.

356 सोह् *shine, be fit* = Skr. शुभ्, I. cl. शोभते, Pr. सोहइ (H. C. 1, 187), H. सोहै.

357 सौंप् *deliver* = Skr. सम्-क्षप्, Causal समर्पयति, Pr. समप्पेइ or VI. cl. समप्पइ, H. सौंपै. See No. 349, footnote.

358 हन् *kill* = Skr. हन्, II. cl. हन्ति, but Vedic also I. cl. हनति, Pr. हणइ (H. C. 4, 418), H. हनै.

359 हर् *take away* = Skr. हृ, I. cl. हरति, Pr. हरइ (H. C. 4, 234), H. हरै.

* ०घ्रा would form ०ग्घेइ or ग्घइ in Pr., just as ०ड्डेइ or ०ड्डइ of ०स्था; and सम would contract to सूँ in Hindi, just as in सौंपै for Pr. समप्पइ, see No. 357; the intermediate form being सग्घइ (cf. H. C. 4, 397). The root, however, might be derived from Skr. शिंघ्, I. cl. सिंघति, Pr. सिंघइ; only the Hindi ought to be सींघै; and the change of ई to ऊ would be very anomalous. (Dr. R. Mitra in his vocabulary quotes घे ग्घे [illegible] दान ?).

360 हरिस or हरस् *be glad* = Skr. हृष्, I. cl. हर्षति, Pr. हरिसइ (Vr. 8, 11; perhaps denom. of हरिस = हर्ष Vr. 3, 62), E. H. हरिसै or W. H. हरसै. See No. 209.

361 हलप् *toss about* = Skr. कल्, (Causal Passive कलाप्यते), Pr. हलप्पइ, H. हलपै.

362 हवा *scream* = Skr. ह्वे, I. cl. ह्वयति, Pr. VI. cl. हवाअइ or (contr.) हवाइ, H. हवाय्.

363 हंस् or हाँस् *laugh* = Skr. हस्, I cl. हसति, Pr. हसइ (T. V. 2, 4. 69) or हस्सइ (Passive), H. हंसै or हसै.

364 हाँप् or हाँफ् *blow* = Skr. भ्मा, Causal भ्मापयति, Pr. धंपेइ or VI cl. धंपइ or हंपइ, H. हाँपै or (corr.) हाँफै.

365 हाल् intr. *shake* = Skr. कल्, Passive कल्यते (used actively), Pr. हलइ, H हालै. See No. 68.

366 हिल् intr. *shake* = Skr. ह्वृ, I. cl. ह्वरति, Pr. VI. cl. हिरइ or हिल्लइ, H. हिलै.

367 हुन् *sacrifice* = Skr. धू, V. cl. धुनोति, Pr. VI cl. धुणइ or हुणइ (H. C. 4, 241 where it is referred to Skr. root ह), H. हुनै.

368 हूल् *drive, goad* = Skr. हूड् *go*, Causal हूडयति, Pr. हूडेइ or VI. cl. हूडइ, H. हूलै.

369 हो *be* = Skr. भू, I. cl. भवति, Pr. भवइ or हवइ or ह्वइ or होइ (H. C. 4, 60), H. होय

Part II.—*Secondary Roots.*

Comp. = compound root; den. = denominative; der. = derivative; N. = noun; P. P. P. = past participle passive.

The Sanskrit equivalents are not given, unless when they actually exist; what theoretically they might have been, has been explained in the introductory remarks; see also my Comparative Grammar, §§ 351—354.

Some of the explanations attempted in this list, are, of course, only tentative; a few such have been indicated by a mark of interrogation.

1 comp. अटक *be hindered, stopped* = Skr. अट + क, Pr. अटक्केइ or अटक्कइ, H. अटकै.

2 comp. उचक् *be raised, rise* = Skr. उच + क, Pr. उचक्केइ or उचक्कइ, H. उचकै.

3 comp. उवक् *vomit* = Skr. उद्-वम् + क, Pr. उव्वंकेइ or उव्वंकइ, H. उवकै.

4 comp. ओक् or ओंक् *vomit* = Skr. वम + क, Pr. वमक्केइ or वमक्कइ, Ap. Pr. वमेक्कइ, H. ओंकै or ऊँकै (with ओ for अव or अम, see my Comp. Gramm. § 122).

5 der. उखड़् *be pulled out, slip out*, a passive or intransitive, derived from उखाड़्, see No. 6.

6 den. उखाड़् or उखेड़् *pull out, uproot* = Skr. P. P. P. उत्खट, Pr. उक्कड्ड (cf. H. C. 4, 187), H. उखाड़ै (for उकाड़ै, with transferred aspiration, see my Comp. Gramm. § 132) or उखेड़ै (for उकेड़ै with change of *a to e*, see my Comp. Gramm. § 148). See No. 13.

7 den. ओढ़् *put on, dress* = Skr. उपवेष्ट, I. cl. उपवेष्टते, Pr. ओवेड्ढ. (cf. H. C. 4, 221), H. ओढ़ै (contracting ओवे to ओ). Probably from a P. P. P. of the root विश्.

8 comp. कड़क् *crackle, thunder* = Skr. कर्द् + ख, Pr. कड्ढक्केइ or कड्ढक्कइ, H. कड़कै.

9 den. कमाव् *earn* = Skr. N. कर्मय्; Pr. कम्मावेइ or कम्मावइ, (H. C. 4, 111 has कम्मवइ and gives it as a substitute of the root उपभुज्; the *á* is shortened to *a*, by H. C. 3, 150), H. कमावै.

10 comp. कसक् *be painful, be pained* = Skr. कष + ख, Pr. कसक्केइ or कसक्कइ, H. कसकै.

11 der. कट् *be cut*, a passive or intransitive, derived from root काट्, see primary roots, No. 27.

12 der. कट् *be pulled out, escape*, a passive or intransitive, derived from root काढ़्. See No. 13.

13 den. काढ़् *pull out* = Skr. P. P. P. कृष्ट; Pr. कड्ढइ (H. C. 4, 187), H. काढ़ै.

14 comp. खरक् or खड़क् *make a tremulous noise, rustle, rattle* = Skr. स्खल् + ख; Pr. खल्लक्कइ or खडक्कइ, H. खरकै or खड़कै. There is also a reduplicated root खरखर् or खड़खड़् of the same meaning. They also occur in Maráṭhí and Panjábí. The primary meaning of the root is; *slip* or *glide along with a sound*; this is preserved in the Maráṭhí खरक् or खड़क् which is used of the running of a stream, or the crashing of a boat, dragged over gravel, &c. The simple root खड् occurs in Maráṭhí with its original meaning *be shed, fall off*; also in Panjábí, where however it has become transitive, *carry off*. The change of ल or र to ड or ड़ is anomalous; but it already took place in Prákrit; thus in Spt. 44, अक्खडइ for Skr. आस्खलति, Spt. 195 खडिअ for Skr. स्खलित. Perhaps there may be a connection with the root स्कंद्; compare also the roots चर् and चल्. See also roots चरक् and फरक्.

15 der. गड़् *be hollowed, be sunk*, a passive or intransitive, derived from root गाड़्; see No. 16.

16 den. गाड़् *hollow, bury* = Skr. N. गर्त, Pr. गड्ड (Vr. 3, 25), Pr. गड्डेइ or गड्डइ, H. गाड़ै. Or possibly a mere corruption of root गाढ़्, No. 17, by disaspiration.

17 den. गाड़् *dig in, fix in, bury* = Skr. P. P. P. गाढ (of root गाह्), Pr. गाडइ, H. गाड़ै.

18 den. गोद् *mark, brand* = Skr. N. गोर्द; Pr. गोदेइ or गोद्दइ, H. गोदै (?); brands being made on the forehead or bosom.

19 den. घबराव् *be alarmed, agitated*, perhaps corrupted form गड़बड़ाव् with the same meaning, a reduplicative or alliterative form, made from गड्ड = Skr. N. गर्द *noise, cries of alarm* (?).

20 den. घिनाव् or घिनियाव् *be disgusted* = Skr. N. घृणा or deminutive घृणिका (of root घृण्), Pr. घिणा (H. C. 1, 128) or घिणिआ; Pr. घिणावेइ or घिणिआवेइ or घिणावइ or घिणिआवइ, H. घिनावै or घिनियावै.

21 der. घिर् *be collected, surrounded, gather*, a passive or intransitive of root घेर्. See primary roots, No. 64.

22 comp. चपक् *be compressed, collapse* = Skr. चप or चर्प + क, Pr. चप्पकेइ or चप्पकइ, H. चपकै.

23 comp. चमक् *glitter* = Skr. चमत् + क, pass. चमत्क्रियते (with active meaning), Pr. चमकेइ or चमकइ, H. चमकै.

24 den. चाह् *wish*, corrupted for छाह्, see No. 40.

25 der. चिर् *be torn, split*, a passive or intransitive, derived from root चीर्; see No. 31.

26 den. चिकनाव् *smooth, polish* = Skr. N. चिक्कण (or चिक्किण; perhaps itself a compound word of चित् *bright* = चिच, and क्क = Pr. क्किण; lit. *made clear*); Pr. चिक्कणावेइ or चिक्कणावइ, H. चिकनावै.

27 den. चिड़ाव् or चिड़ाव् *abuse, vex* = Skr. P. P. P. चिप्त (from root चिप् *abuse*); Pr. छिडावइ, H. चिढ़ावै (with transfer of aspiration) or चिड़ावै (with loss of aspiration). As to the changes of aspiration, see No. 47 छेड़् or छोड़्, where it is preserved; also primary root, No. 65 चढ़् (footnote, p. 45). As to the change of प्त to त्त to ड (or ड्ड), compare root जुड़ाव् from P. P. P. युक्त; and primary roots Nos. 92, 93 जुट् and जोड़्.

28 den. चिताव् *make known to, warn, admonish* = Skr. P. P. P. चित्त; Pr. चित्तावेइ or चित्तावइ (cf. S. B. 11, 1), H. चितावै. In Setubandha 11, 1 occurs the past participle चित्तविअं (with *a* for *á*, by H. C. 3, 150), which is correctly explained by the commentator as meaning चेतितं *made known to*, or निहतं *restrained, warned* (or निर्हं), परितोषितं *admonished, comforted*; (see S. Gdt. pp. 84, 156).

29 den. चीत् *paint* = Skr. N. चित्र; Skr. चित्रयति, Pr. चित्तेइ or चित्तइ, H. चीतै.

30 den. चीन् or चीह्न *recognize* = Skr. N. चिह्न, Pr. चिण्ह (H. C. 2, 50); Skr. चिह्नयति, Pr. चिण्हेइ or चिण्हइ, H. चीन्है or चीनै.

31 den. चीर् *tear, cleave* = Skr. N. चीर (*rag*), whence Skr. चीरयति, Pr. चीरेइ or चीरइ, H. चीरै.

32 comp. चुक् *be finished, cease* = Skr. च्युत् + क; Pr. चुक्कइ (H. C. 4, 177), H. चुकै. H. C. gives it as a substitute of the Skr. root भ्रंश् *fall down, decay*, a synonym of च्युत्; so also the commentator to Spt. 323, see Wb. p. 184. The correct derivation from च्युत् is given by the commentator on Setubandha 1, 9. The Skr. root चुक् *inflict pain*, X. cl. चुक्कयति, is doubtlessly reintroduced from the Prákrit. See No. 33.

33 comp. चूक् *blunder, miss* = Skr. च्युत्+क; Pr. चुक्कइ, H. चूकै. This is clearly identical with the former, as regards origin. The original meaning "fall," "drop," (from the truth) would easily lead to "blunder." In this sense it is well-known to Prákrit; *e. g.*, Spt. v, 323, चुक्कसंकेआ "blundered or missed meeting"; again Spt. v. 199, Setubandha 1, 9, where the commentary correctly explains it प्रमादे देशी इति केचित्, *i. e.*, according to some it is a desí word meaning "blundering" (See S. Gdt., p. 157). See No. 32.

34 den. चोराव *steal* = Skr. N. चार or चौर; Pr. चोरावेइ or चोरावइ, H. चोरावै.

35 comp. चौंक् *start (from fright)* = Skr. चमत्+क, passive चमत्क्रियते (used actively), Pr. चमक्केइ or चमक्कइ, Ap. Pr. चवँक्कइ, H. चौकै.

36 der. छन् *be strained, filter*, a passive or intransitive derived from छान्, No. 38.

37 den. छल् *deceive, cheat* = Skr. N. छल; Skr. छलयति, Pr. छलेइ or छलइ, H. छलै.

38 den. छान् *strain, search* = Skr. P. P. P. स्यन्न (of root स्यंद्), Pr. *सन्नेइ or छन्नेइ (Ls. 199) or छन्नइ, H. छानै (?).

39 den. छाप् *stamp, print*; an active or transitive derived from root छप्; perhaps merely another form of root थाप्; see Appendix Nos. 4 and 13.

40 den. छाह् or चाह् *wish* = Skr. N. उत्साह; Pr. उच्छाहेइ (cf. H. C. 2, 22) or उच्छाहइ, H छाहै or (disaspirated) चाहै; or from Skr. N. इच्छा, Pr. इच्छाएइ or इछाअइ, H. चाहै (with transferred aspiration) or छाहै. As to the elision of initial उ or इ, see my Comp. Gramm. § 173 (cf. Addenda); and as to the change of aspiration, *ibidem* § 132.

41 comp. छिटक् *be dispersed, be scattered* = Skr. क्षिप्त + क; Pr. छिट्टकेइ or छिट्टकइ, H. छिटकै. See No. 46.

42 den. छिड् *be vexed, take offence*, a passive or intransitive, derived from R. छीड् or छेड्, No. 46.

43 comp. छिड़क् *sprinkle* = Skr. सृष्ट + क; Pr. छिडक्केइ or छिडक्कइ, H. छिड़कै. As to the derivation of छिड from Skr. सृष्ट, see No. 45 छोट; and as to the softening of the final, छोट is to छिड़, as जुट to जोड़, q. v.

44 den. छींक् *sneeze* = Skr. N. क्षिक्का; Skr. क्षिक्षयति, Pr. छिक्केइ or छिक्कइ, H. छींके. The word क्षिक्का, however, is itself a compound from क्षिव् *sneezing* and का; and the word क्षिव् is probably another form of च्युत् *sneezing*, from Skr. root च्यु *sneeze*.

45 den. छोट् or छींट् or छेट् *sprinkle* = Skr. P. P. P. क्षुण्ण *sprinkled*, Pr. छिण्ण (with छि for क्षु, as in छिच्चइ or छिव्वइ or छिप्पइ, H. C. 4, 182. 257; see also primary roots Nos. 78, 80); Pr. छिट्टेइ or छिट्टइ, H. छींटै or छींटै or छेटै (on disaspiration see my Comp. Gramm. § 145, Exc. 2; on the anunásika, § 149; and on the change of ट to ए, § 148). Or from Skr. N. सेक्त (of root सिच्), see primary root No. 342.

46 den. छोड़् or छेड़् *abuse, rex* = Skr. P. P. P. क्षिप्त *abused;* Pr. छेड्डेइ or छेड्डइ, H. छेड़ै or छोड़ै. See Nos. 27, 42. Probably from क्षिप्त was derived a root क्षिट्, just as Skr. root जुट् from युक्त; the causal of क्षिट् would be क्षेटि, just as causal जोटि of जुट्; whence we should have Pr. छेड्डेइ, just as Pr. जोड्डेइ, and H. छेड़ै just as H. जोड़ै. The root क्षिट् which would correspond to जुट् does not exist in Hindí, except in the compound क्षिटक्, see No. 41. A similar series of roots are छुट् or छूट् and छोड़.* Possibly also Nos. 43 and 45, may be derived from क्षिप्त.

47 den. छीन *take away, snatch* = Skr. P. P. P. क्षिन्न (of root क्षिद्), Pr. छिन्नेइ or छिन्नइ, H. छीनै.

48 den. छुट् or छूट् *be let off, be released* = Skr. P. P. P. क्षिप्त, Pr. छुत्त (H. C. 2, 138) or छुइ (S. C. 1, 3, 142 छूट?); Pr. छुट्टेइ or छुट्टइ, H. छुटै or छूटै. See Nos. 46 and 50. The root छुट् or च्युट् has not been adopted into Sanskrit, except in its causal or transitive form च्योट्†

* There would be the following series of forms:

Skr. युक्त, Pr. जुत्त or जुइ; Roots Skr. जुट्, Pr. जुड्ड or जुड, H. जुट् or जुड़्, Caus. जोड़
„ क्षिप्त, „ छुत्त „ छुइ; „ „ छुट्, „ छुड्ड „ छुड, „ छुट् „ छुड़् „ छोड़
„ क्षिप्त, „ क्षित्त „ क्षिइ; „ „ क्षिट्, „ क्षिड्ड „ क्षिड, „ क्षिट् „ क्षिड़्, „ छेड़्.

The Pr. roots in ड्ड would seem to be the original derivatives from the Skr. P. P. P.; they were reintroduced into Sanskrit with one final ट्, and afterwards gave rise to the alternative Pr. root in ड, by the ordinary phonetic change of ट् to ड्. The two alternative Pr. roots in ड्ड and ड्, reappear in H. as roots in ट् and ड़्. As to the Skr. root छुट्, see footnote to No. 48. The root क्षिड् appears to have been little used; it is not mentioned among Skr. roots, nor does it survive in Hindí, except in क्षिटक, see No. 41.

† The root छुट् does exist in Skr., but it has assumed a somewhat different, though connected meaning "*cut*" (whence H. छुड़ी *knife*). The same transition of

49 den. छेद् *perforate* = Skr. N. छिद्र (of R. छिद्); whence Skr. छिद्रयति, Pr. छिद्देइ or छिद्दइ, H. छेदै.

50 der. छोड् *release*, an active or transitive, derived from R. छुट् No. 48. Compare Skr. root क्षोट्.

51 den. जुगाव् *pair off labor* (i. e., *assist another with labor, in expectation of similar assistance being returned hereafter*) = Skr. N. युग्म, Pr. जुग्ग (H. C. 2, 78); Pr. जुग्गावेइ or जुग्गावइ, H. जुगावै. The root comes to mean generally: *be provident, be careful of.*

52 den. जनाव् *make known, warn* = Skr. P. P. P. ज्ञप्त (of caus. of R. ज्ञा); Pr. जणावेइ or जणावइ, H. जनावै.

53 den. जम् *germinate* = Skr. N. जन्म, Pr. जम्मेइ or जम्मइ (H. C. 4, 136), H. जमै

54 den. जीत् *overpower, win* = Skr. P. P. P. जीत (of R. जि); Pr. जित्तेइ or जित्तइ, H. जीतै.

55 der. जुड् *be joined*, a passive or intransitive, derived from root जोड़् see No. 57.

56 den. जुट् *unite* = Skr. P. P. P. युक्त, Pr. जुत्त (H. C. 1, 42) or जुइ, (see Nos. 46, 48), Pr. जुट्टेइ or जुट्टइ, H. जुटै. Compare Skr. root जुट्.

57 der. जोड़् *join*, an active or transitive, derived from root जुट्, see No. 56.

58 den. जोत् *yoke* = Skr. N. योक्त्र, Skr. योक्त्रयति, Pr. जोत्तेइ or जोत्तइ, H. जोतै.

59 den. जोह् or जोव् or जो *see* = Skr. N. ज्योतिस् *eye, sight*; Pr. जोएइ (H. C. 4, 422, 6) or जोअइ (cf. H. C. 4, 332 जोअंतिहे), H. जोए or जोवै or जोहै (with euphonic व् and ह्, see my Comp. Gramm. § 69).

60 comp. झटक् tr. *twitch*, intr. *shake* = Skr. झट + क; Pr. झट्टक्केइ or झट्टक्कइ, H. झटकै. As to the derivation of झट, see primary root झाँट् No. 96.

61 comp. झपक् intr. *spring*; tr. *throw on, move to and fro, snatch* = Skr. झंप + क; Pr. झंपक्के or झंपक्कइ, H. झपकै. Hemachandra 4, 16 notices the corresponding uncompounded verb झंपइ, but only as an intransitive "move to and fro" (said to be = Skr. भ्रमति). Hindí and Maráṭhí have the same uncompounded verb झाँपै, but as a transitive, "cover with a thatch" (lit., *throw on*, i. e., bundles of

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meaning may be observed in another series of Skr. roots, which also are derived from छिन्न. The latter becomes in Pr. खित्त (H. C. 2, 127) or खुत्त (Spt. v. 278) or खुट्ट; whence Pr. den. roots खुड् or खुड् (H. C. 4, 116 खुट्टइ and खुडइ *he breaks*), H. खूट् (खुड् does not exist). This root खुड् as well as the corresponding causal or transitive forms खोट् or खोड् have been adopted into Sanskrit. See primary root No. 41.

grass.)* As to the derivation of झंप, see Appendix No. 6. Hindí has an adverb झप् *quickly*; it has also another kind of compound root झपट् with the same meaning as झपक्. On these obscure compound in ट roots, see my Comp. Gramm. § 354, 2.

62 comp. झलक् *shine, glare* = Skr. झला + क; Pr. झलकेइ or झलकइ, H. झलकै. As to the derivation of झल, see primary root No. 98.

63 den. झाँक् *peep, spy* = Skr. N. अध्यच; Pr. अज्झक्खइ, H. झाँकै (with loss of initial अ, and disaspiration)?

64 comp. झौंक् *sigh, lament* = Skr. शोच् + क; Passive शोक्यते (used actively), Pr. झिक्केइ or झिक्कइ, H. झौंकै.

65 comp. झुक् or झोक् *stagger, nod, bend* = Skr. क्षुभ् (acc. sg. neut. क्षुप्) + क; Pr. झुक्कइ, H. झुकै or झोकै.

66 comp. झोक् or झोंक् *throw, cast* = Skr. क्षेप (or क्षप) + क; Pr. झेवक्कइ, H. झोंकै or झोकै. As to झो = एव, see my Comp. Gramm. § 122?

67 der. टिक् *be propped, stay*, a passive or intransitive, derived from No. 68.

68 comp. टेक् *prop, support* = Skr. त्राय (of root त्रै) + क; Pr. टायक्कइ, H. टेकै?

69 den. टट् *fix, arrange* = Skr. P. P. P. स्तब्ध (of root स्तंभ्); Pr. टड्ढेइ or टड्ढइ, H. टटै. The hardening of ढ् to ड is probably caused by the influence of the initial ट. In old Hindí टड्ढै occurs in the sense of "stopping short", "standing amazed". When the past participle is used as such (not as an element of a denominative verb), the original ढ is still preserved in Hindí; thus old Hindí ठाढ, modern Hindí ठडा "standing".

70 comp. टटक् or ठिटक् *stop short, stand amazed* = Skr. स्तब्ध + क; Pr. टड्ढक्कइ, H टटकै or ठिठकै. As to the derivation of टठ, see No. 69; as to ड् for ध्, see my Comp. Gramm § 35.

71 comp. टनक् *jingle, tinkle, &c.* = Skr. स्तन *sounding* + क; Pr. टनक्केइ or टनक्कइ, H. टनकै. Compare Skr. टंकार *clang, twang*, &c. from टं + क; ट or ठ means any "sound."

72 comp. ठमक् *strut* = Skr. स्तम्भ + क; Pr. ठम्भक्कइ or ठम्हक्कइ, H. ठमकै. Skr. स्तम्भ becomes Pr. थंभ or ठंभ (H. C. 2, 9, whence H. थाम् *prop, pillar* and ठाम् *place, residence*. The change of म्भ to म्ह to म may be observed in the primary roots Nos. 117, 118.

73 comp. ठमक् *knock, chip* = Skr. तक्ष + क, see root ठाँस् No. 10. in Appendix. Hindí has an interjection ठम्, imitating the sound of *knocking* or *hammering*; also ठमनो *rammer* (an instrument).

74 den. ठहर् *be fixed, remain*, another form of No. 75; possibly arisen by

* Panjábí has झंबे, with ब् for प; and झांप् *thatch*, with फ् for प्. The former might be referred to the Skr. root झंब्.

a mere transposition, ठड्ढ् *thaṛh* = ठड्ह् *thaṛah* = ठहड् *thahaṛ* = ठहर् *thahar*. Or the element र् may be the same as र् or ल् in टहर् or टहल्, &c. (see my Comp. Gramm. § 354, 2), and ठह = Pr. ठड्ढ = Skr. स्तब्ध. Hindí has the noun ठाहर् *place.*

75 den. ठाढ़् or ठाड़् *be fixed, be erect, stand* = Skr. P. P. P. स्तब्ध, Pr. ठड्ढ (H. C. 2, 39); Pr. ठड्ढेइ or ठड्ढइ, H. ठाढ़ै or ठाड़ै.

76 den. डर् *fear* = Skr. N. दर, Pr. डर (H. C. 8, 217); Pr. डरइ (H. C 4, 198), H. डरै.

77 den. डाह् *be hot, burn* = Skr. N. दाह, Pr. डाह (H. C. 1, 217); Pr. डाहेइ or डाहइ, H. डाहै.

78 comp. ढक् *cover* = Skr. N. स्थग् (acc. sing. neut. स्थक् *covering*) + क; Pr. ढक्कइ (H. C. 4, 21), H. ढकै See primary root No. 105.*

79 der. ढल् or ढर् *flow*, a passive or intransitive of root ढाल् or ढार्, see Appendix No. 11.

80 comp. थक् or थाक् *be wearied, be fatigued* = Skr. स्तभ् (acc. sing. neut. स्तप्) + क; Pr. थक्केइ (H. C. 4, 370) or VI. cl. थक्कइ (H. C. 4, 87. 259; where it is said to be a substitute of Skr. फक्कति *move slowly from fatigue*), H. थकै or थाकै. In H. C. 4, 16 the root is given as an equivalent of स्था *stand;* the Bangálí has थाक् (pronounced *thak*) *stay, remain.* The original meaning of the Hindí is *to come to a stop* (from fatigue). The Skr. passive स्तभ्यते (= स्तप्+क्यते) means "*to be made firm or rigid, be paralysed, be stopped.* The original meaning of "rigidity" is preserved in the Hindí थक् or थक्क *a congealed lump, a clot.* The stoppage may be owing to fatigue or to wonder; hence Hindí थकित् *stopped* or *wearied* or *astonished.* Other derivatives of the Hindí root are अथक् *unwearied*, थकावट् *weariness*, थक्काफक्का *perplexed.*†

81 comp. थपक् *strike, slap, tap* from थप + क; as to the derivation of थप, see root थाप् in the Appendix No. 13.

* It might be also derived, as a primary root, from Skr. तक्ष्, I. cl. तक्षति, Pr. तक्खइ = थक्कइ (with transfer of aspiration) = ढक्कइ (softening and cerebralising थ). Compare the roots ठाँस्, ठक्, ठोस्, ठोक् in the Appendix, which show that the Skr. roots तच् and त्वच् had a tendency in Prákrit to transfer the aspiration (थ) and cerebralise the initial (ठ). The Skr. root तक्ष् means *chipping off* (by striking) and *covering;* a similar change of meaning appears in the Hindí root मढ़् *cover* from Skr. मृद् *rub, strike.*

† S. Goldschmidt, *Prákritica*, No. 7, p. 5 derives it, as a denominative root, from P. P. P. थग्ध of a root थंघ्, which he identifies with the root स्थभ, and assumes a change of ग्ध to क. This theory is based on three hypothetical steps: the identity of थंघ् and स्तंभ्, the existence of a P. P. P. थग्ध, the change of ग्ध to क. Pischel in *Bezzenberger's Beitrage* III, 235 derives it simply from a hypothetical Skr. root स्थक्.

82 comp. थल्क् or थरक् *tremble, flutter;* probably a mere various pronunciation of खरक् or फरक्, q. v.; the interchange of फ and थ is shown by the Pr. फक्कइ and थक्कइ (H. C. 4, 87), and that of ख and थ by खंभो and थंभो (H. C. 2, 8). There is also a reduplicated root थल्थल् or थरथर् corresponding to खरखर् and फरफर्.

83 comp. थिरक् *be set, be settled, well postured* (e. g., in dancing) = Skr. स्थिर + क; Pr. थिरक्केइ or थिरक्कइ, H थिरकै.

84 den. थिराव् intr. *settle* (as liquor) = Skr. N. स्थिर; Skr. स्थिरायति Pr. थिरावेइ or थिरावइ, H. थिरावै.

85 comp. थुक् *spit* = Skr. ष्ठेव (or स्थेव) + क; Pr. थुक्केइ or थुक्कइ, H. थूकै. As to the contraction of एव to उ or ऊ, see my Comp. Gramm. § 122.

86 den. दौड़् or दौड़् *run* = Skr. N. द्रव, Pr. diminutive द्दवड; Pr. द्दवडेइ or द्दवडइ, E. H. दौड़ै or W. H. दौड़ै. In Chaṇḍa's Prákrit Lakshaṇa C D, II, 27*h*, there is noticed a root डवडव *run about with lowering face* (अतिरभसाद् कर्द्धमुखस्य इतस्ततो गमने डवडव); Maráṭhí has both डवडव and डवड in the same sense; it has also द्दवड *run;* these two roots are probably identical, the change of initial द् to ड being not uncommon; see H. C. 1, 217.

87 comp. दरक् intr. *split* = Skr. दर + क; Pr. दरक्केइ or दरक्कइ, H. दरकै.

88 comp. दहक् intr. *burn* = Skr. दह + क; Pr. दहक्केइ or दहक्कइ, H. दहकै.

89 den. दुख intr. *pain* = Skr. N. दुःख; Skr. दुःखयति, Pr. दुक्खेइ or दुक्खइ, H. दुखै.

90 comp. धडक् *blaze, be hot* (from any passion), *be distressed, tremble* (from fear), = Skr. दग्ध + क, Pr. दड्ढक्कइ, H. धडकै (for दढकै, with transfer of aspiration). There is also reduplicated root धडधड*.

91 den. धार् *pour* = Skr. N. धार; Pr. धारेइ or धारइ, H. धारै.

92 comp. धौंक् or धौंक् *blow, breathe upon* = Skr. धम + क; Pr. धमक्केइ or Ap. Pr. धवँक्कइ, H. धौंकै.

93 den. नट् *dance* = Skr. N. नर्त; Skr. नर्तयति, Pr. नट्टेइ or VI. cl. नट्टइ (H. C. 4, 230. 2, 30), H. नटै. The Skr. root नट (I. cl. नटति or X. cl. नाटयति) is adopted from the Prákrit.

94 der. नद् *flow*, a passive or intransitive, derived from primary root नद्दा No. 136.

95 den. नद्दाड् *flee* = Skr. P. P. P. क्षप्त (of R. क्षप् *eject*); Pr. णट्ठइ, E. H. नद्दाड़ै. Compare Pr. पक्खइ (H. C. 4, 200) from Skr. पर्यस्त.

* Hindí has a word धड् *body*, and धड् *firm, strong, sound*. This is probably derived from Skr. दृढ = Pr. दढ = H. धड.

96 der. निकल् or निकर् *be pulled out, come out;* a passive or intransitive, derived from root निकाल्. See No. 98.

97 der. निकस् *be expelled, come out;* a passive or intransitive, derived from root निकास्. See primary root No. 139.

98 den. निकाल् or निकार् *pull out, eject* = Skr. P. P. P. निष्कृष्ट; Páli and Pr. निक्कड्ढइ, Pr. निक्कड्ढइ or निक्काल्लइ, W. H. निकाले or E. H. निकारै. As to the change of ढ to ल्ह, see my Comp. Gramm. § 115.*

99 den. निखोड् or निखोर् *peel, extract* = Skr. P. P. P. निष्कृष्ट; Pr. निक्कोड्डइ (with *o* for *u*, by H. C. 1, 116) or निक्खोडइ (with transfer of aspiration, as in अक्खोडइ H. C. 4, 188 = अक्कोड्डइ, a denominative of आकृष्ट *extracted*).

100 den निकोस् *grin* = Skr. N. निकुस्मय (from root नि + कु + स्मि); Skr. निकुस्मयते, Pr. निक्कोस्सेइ or VI. cl. निक्कोस्सइ (cf. H. C. 1, 116), H. निकोसै. See my Comp. Gramm. § 148.

101 den. निगल् *swallow* = Skr. N. निगल; Pr. निगलेइ or VI. cl. निगलइ, H. निगलै. It might, however, be a primitive root = Skr. नि + ग्ल, VI. cl. निगिलति, with change of ड् to ञ.

102 den. निपट् *terminate* = Skr. N. निष्पत्ति (from root निस् + पद्); Pr. निप्पट्टेइ or VI. cl. निप्पट्टइ, H. निपटै (?). As to the change of dental त्त to cerebral ट्ट, compare Pr पट्टणं for Skr. पत्तनं, Vr. 3, 23; cf. also Pr. पडइ for Skr. पतति Vr. 8, 51.

103 der. निवह् or निभ् *be accomplished, succeed*, a passive or intransitive root, derived from the primary root निवाह्, No. 146.

104 den. पइट् or पैठ् *enter* = Skr. P. P. P. प्रविष्ट, Pr. पइट्ठ (H. C. 4, 340); Pr. पइट्ठेइ or VI. cl. पइट्ठइ, E. H. पइठै or W. H. पैठै.

105 den. पक् *ripen* = Skr. P. P. P. पक्व, Pr. पक्क (H. C. 2, 79); Pr. पक्केइ or पक्कइ, H. पकै.

106 den. पकड् *seize* = Skr. P. P. P. प्रकृष्ट; Pr. पक्कड्डइ (cf. H. C. 4, 187), H. पकड़ै (for पकड्डै, with lost aspiration, as in root गाड् No. 16, उखाड् No. 6, ठाड् No. 75, and others).

107 den. पछताव् *repent* = Skr. N. पश्चात्ताप; Pr. पच्छत्ताएइ or VI. पच्छत्तावइ, H. पछतावै.

108 den. पट *be paid, be roofed, be watered* = Skr. N. पत्र or पट्ट or प[illegible] Pr. पट्टेइ or VI. cl. पट्टइ, H. पटै. Skr. पत्र is any "vessel", [illegible] for irrigating; पट्ट is the table or leaf on which the accounts [illegible] payments are kept; पट means a "roof."

* So also Bs. I, 354. III, 58. The Hindí root निकाल् is, of course, referable to the Skr. root निस् + कल्; but the latter is most probably itself adopted from the Prákrit; Skr. निष्कालयति = Pr. निक्काल्लेइ. The Pr. form निक्खालेहि, quoted by Bs. III, 58, is misspelt for निक्काल्लेहि.

109 den. पनप् *expand, grow, prosper* = Skr. N. प्रपञ्च (of root प्र-पंच्), Skr. प्रपञ्चयति, Pr. पपञ्चेइ or पपञ्चइ (cf. Pr. पण्णासा = Skr. पंचाशत् H. C. 2, 42), H. पनपै (transposed from पपनै, see my Comp. Gramm. § 133, see also primary roots Nos. 165, 166).

110 den. पनियाव् *irrigate* = Skr. N. पानीय, Pr. पाणिअ (H. C. 1, 101), Pr. पाणियावेइ or पाणियावइ, H. पनियावै (see my Comp. Gramm. § 25).

111 den. परिस् or परस् *touch* = Skr. N. स्पर्श, Pr. फरिस (Vr. 3, 62); Pr. फरिसइ (H. C. 4, 182), H. परिसै or परसै (with lost aspiration, and change of *i* to *a*; see my Comp. Gramm. §§ 58 note, 130).

112 den. पल्लट् or पल्लथ् intr. *turn over* = Skr. P. P. P. पर्यस्त, Pr. पल्लइ or पल्लत्थ (Vr. 3, 21. H. C. 2, 47), Pr. पल्लइद् or पल्लत्थइ (H. C. 4, 200), H. पलटै or पलथै. In H. C. 4, 200. 258 पल्हत्थ and पल्हत्थइ are spelled so; see my Comp. Gramm. § 161.

113 den. पहिचान् or पहचान् *recognise* = Skr. N. परिचयन; Pr. परिचअणेइ or परिचअणइ, H. पहिचानै or पहचानै (for पहचानै; with elided र् and inserted euphonic ह्, see my Comp. Gramm. §§ 69, 124) (?).

114 der. पिहन or पहिन् intr. *dress, put on*, a passive or intransitive, derived from the primary root पिहनाव् or पहिनाव्, No. 165.* See also primary root पहिर् No. 166.

115 comp. पिचक् *be squeezed, be shrivelled* = Skr. पिच + ल; Pr. पिचकेइ or पिचकइ, H. पिचकै Compare Skr. पिचिट *squeezed;* and as regards the derivation of पिच or पिच, see primary root पोच No. 175. The word has been adopted into Skr. from the Prákrit.†

116 den. पिछल् or फिसल् *slip* = Skr. N. पिच्छिल or पिच्छल slippery; Pr. पिच्छलेइ or पिच्छलइ, H. पिछलै or फिसलै. (transferring the aspiration to प and changing छ to स; see my Comp. Grammar § 11). See No. 125.

117 der. पिट् *be beaten*, a passive or intransitive, derived from root पीट No. 119.

118 der. पिस् *be beaten, bruised*, a passive or intransitive, derived from root पेस्, No. 121. See also No. I, 184.

119 den. पीट् *beat* = Skr. P. P. P. पिष्ट; Pr. पिट्टेइ (Spt. 173) or पिट्टइ (with ट् for ष्, as in पल्लट्टइ for पल्लट्ठइ (H. C. 4, 200), H. पीटै. See No. 121.

120 den. पुकार् *call, shout* = Skr. N. सूत्कार or फूत्कार or पूत्कार; Pr. फुक्कारेइ

* In Bengálí the root is पिनध्, which is a denominative of the Skr. P. P. P. पिनद्ध *dressed*. Possibly the Hindí root may be explained in the same way by a further change of ध् to ह.

† In the Skr. word चिपिट *pressed down* a metathesis of प and च appears to have taken place.

or पुकारेइ or पुकारइ, H. पुकारै. A similar change of फ to प, in root परिस् No. 111. An intransitive or passive form of this root occurs in the old Hindí of Chand's Prithiráj Rasau: पुकर् *be called.*

121 den. पेल्ल *squeeze, beat* = Skr. P. P. P. पिष्ट; see primary root No. 184.

122 den. पुन् *revile*, perhaps = Skr. N. पुण्य *blessed;* euphuistically.

123 comp. फटक् tr. *separate, winnow*, or intr. *be separated* = Skr. स्फट + क; Pr. फडकेइ or फडकइ, H. फटकै. The Pr. doubles the radical ट; see primary root फट् No. 186.

124 comp. फरक् or फड़क् *tremble* = Skr. स्फर + क; Pr. फरकेइ or फरकइ, H. फरकै or फड़कै. The reduplicated root फरफर् or फुरफुर् also occurs. See roots थरक् No. 82 and खरक् No. 14.

125 den. फिसल् *slip, slide*, see No. 116. For a similar transfer of aspiration on account of change of क to स, see root ट स् in Appendix No. 8.

126 comp. फूँक् *blow* = Skr. फूत् + क; Pr. फक्केइ or फक्कइ, H. फूँकै. See H. C. 4, 422, 3. फुक्किज्जंत, and Spt. 178 फक्कतथ.

127 der. फुक् *be blown*, a passive or intransitive, derived from root फूँक् No. 126.

128 den. बइट् or बैठ् *sit* = Skr. P. P. P. उपविष्ट, Pr. उवइट्ठ (like पइट्ठ, No. 104) or ओइट्ठ (cf. H. C. 1, 173), H. बइठै or बैठै (as to change of ओ to ब, see my Comp. Gramm. § 71). The initial ब for व is somewhat anomalous, as such an "expansion" व does not ordinarily harden to ब. Another way of explaining the Hindí बइठ् is to assume that the initial उ of Pr. उवइट्ठ has been dropped (so in my Comp. Gramm § 173, and Bs. I, 179. III, 38); but this does no more obviate the anomaly; for a Pr. ब, softened from Skr. प, does not, as a rule, harden in Hindí.

129 comp. बक् *talk, chatter* = Skr. वाच् + क; Pr. वक्कइ, H. बकै. Or possibly a mere corruption for बुक्, Pr. बुक्कइ or बुक्कइ (H. C. 4, 98), Skr. बुक्कति or बुक्कयति a comp. of ब्रू + क. Hindí does not possess the form बुक्, but it has a derivative of it, बुकल्लाव्; Maráthí has both बुक् and बुकल्.

130 den. बाँच् *read, recite* = Skr. N. वाच्य; Pr. वच्चइ, H. बाँचै.

131 comp. बहक् *go beyond bounds, stray* = Skr. बहिस् + क; Pr. बहिक्केइ or बहिक्कइ, H. बहकै.

132 der. बिथर् *be spread*, a passive or intransitive, derived from the primary root बिथार् No. 225.

133 den. बिराव् *mock, jeer* = Skr. N. विराव *sound, noise;* Pr. विरावेइ or विरावइ, H. बिराव.

134 den. बिलट् *become bad*, perhaps connected with P. P. P. विलम्बित (विलग्न?) *wasted.*

135 den. बोट् *scatter, spill* = Skr. P. P. P. व्यस्त; Pr. विट्ठ (for विट्ठ, as पलट्ठ for पलट्ठ, see No. 112); Pr. विट्टेइ or विट्टइ, H. बोटै.

136 den. बीत् *pass* = Skr. P. P. P. बीत, Pr. वित्त (like निच्चिन्त for Skr. निश्चिन्त, H. C. 2, 99; otherwise the preservation of त is not explicable); Pr. वित्तेइ or वित्तइ, H. बीतै.

137 den. बेढ् *enclose, surround* = Skr. वेष्ट्, Causal वेष्टयति or I. cl. वेष्टते, Pr. वेढेइ (H. C. 4, 51) or वेढइ (H. C. 4, 221), H. बेढ़ै. The root is probably a denominative of an anomalous P. P. P. or some other derivative of the root विश् or विष्. The so-called Causal shows its denominative form.

138 den. बउराव् or बौराव् *go mad* = Skr. N. बातुल; Pr. वाउलावेइ or वाउलावइ, H. बउलावै or बौरावै. See my Comp. Gramm. § 25.

139 den. भाग *flee* = Skr. P. P. P. भग्न, Pr. भग्ग (cf. H. C. 4, 354), Pr. भग्गेइ or भग्गइ, H. भागै.

140 den. भींग् or भीग् *be wet* = Skr. अभ्यङ्ग; Pr. अब्भिंगेइ, or अब्भिंगइ, H. भींगै or भीगै (?). As to the loss of initial अ, see my Comp. Gramm. 172. Compare the primary root भीज् in the Appendix No. 21.

141 der. भुन् *be fried, be cooked*, a passive or intransitive, derived from भून् No. 143.

142 den. भूल् or भोल् or भोर् *forget, blunder* = Skr. P. P. P. भ्रष्ट; Pr. भुल्लइ (H. C. 4, 177), W. H. भूलै or भोलै, E. H. भूरै or भोरै. Skr. भ्रष्ट = Pr. भुड्ढ = भुट्ठ = भुल्ल; the change of *a* to *u* caused by the labial *bh*. As to the change of *u* to *o*, see my Comp. Gramm. § 148.*

143 den. भून् *fry, cook* = Skr. P. P. P. भूर्ण (Pan 8, 2. 44); Pr. भुणेइ or भुणइ, H. भूनै.

144 den. मढ् *cover, gilt* (*i. e.* encase by rubbing on) = Skr. P. P. P. मृष्ट, Pr. मट्ठ or (disaspirated) मड्ड; Pr. मड्डइ or मढइ (H. C. 4, 126), H. मढ़ै. The Skr. root मठ् *cover* is adopted from the primitive Prákrit or Páli मट्ठ (= मृष्ट), whence मठ *a covering, hut*, H. मढ़ or मढ़ी. Similarly are formed the roots कढ़्, वेढ़्, &c.

145 den. मत् *consult* = Skr. N. मन्त्र; Pr. मंतेइ or मंतइ (cf. H. C. 4, 260 मंतिदो), H. मतै (with elided nasal, see my Comp. Gramm. § 143).

146 der. मिट् *be effaced, cease to exist*, a passive or intransitive, derived from the root मेट्, No. 153.

147 der. मुंड् *be shaved*, a passive or intransitive, derived from the primary root मूँड, No. 284.

148 der. मुंद् *be closed*, a passive or intransitive, derived from the root मूँद्, No. 151.

* This derivation I owe to S. Goldschmidt, *Prákritica*, No. 8, p. 9. Formerly, looking upon भोल् or भोर् as the more primitive form, I was inclined to consider it a denominative of Skr. भ्रमर, whence comes Hindí भोरा or भोला *a simpleton*.

149 den. मर *die* = Skr. P. P. P. मृत, Pr. मुअ (H. C. 4, 442); Pr. मुअइ, H. मूए.

150 den. मूत् *discharge urine* = Skr. N. मूत्र; Skr. मूत्रयति, Pr. मुत्तेइ or मुत्तइ, H. मूते.

151 den. मूँद् *close* (lit. with a seal ring) = Skr. N. मुद्रा; Skr. मुद्रयति, Pr. मुद्देइ or मुद्दइ, H. मूँदे. See H. C. 4, 401 दिण्णो मुद्द *sealed.*

152 den. मून् *be silent* = Skr. P. P. P. मून (of root मू); Pr. मूणेइ or मूणइ, H. मूने, (or from N. मौन)

153 den. मेट् *efface* = Skr. P. P. P. मृष्ट, Pr. मिट्ठेइ or मिट्टइ (disaspirated for मिट्ठइ, cf. Páli मट्ठ or मट्ठ = मृष्ट), H. मेटे, (with *e* for *i*, see my Comp. Gramm. § 148).

154 den. मौल् or मौर् *blossom* = Skr. N. मौल; whence मौलयति, Pr. मोलेइ or मोलइ, W. H. मौले or E. H. मौरे.

155 den. मौलाव् or मौराव् *blossom* = Skr. N. मौल; Pr. मोलावेइ or मोलावइ, W. H. मौलावे or E. H. मौरावे.

156 den. रग् *be attached* = Skr. P. P. P. रक्त, Pr. रग्ग (H. C. 2, 10); Pr. रग्गेइ or रग्गइ, H. रगे.

157 den. रंग् *dye* = Skr. N. रंग; Skr. रंगयति, Pr. रंगेइ or रंगइ, H. रंगे.

158 der. रुक् *be hindered*, a passive or intransitive, derived from root रोक्, No. 162.

159 der. रुध् or रुद्ध् *be restrained*, a passive or intransitive, derived from the primary root रुंध् No. 298.

160 den. रुठ् or रुट्ठ् *be angry* = Skr. P. P. P. रुष्ट, Pr. रुट्ठ (H. C. 4, 414) or रुड्ढ, Pr. रुट्ठइ or रुड्ढइ, H. रूठे or रूढ़े.

161 comp. रेंक *bray* = Skr. रेप् (acc. sg. neut. रेट्) + क; Pr. रेक्केइ or रेक्कइ, H. रेंके.

162 comp. रोक् *hinder* = Skr. रुध् (acc. sg. neut. रुत्) + क; Pr. रुक्केइ or रुक्कइ, H. रोके.

163 der. रोप् *stop, plant;* a transitive or active, derived from primary root रुप्, No. 295.

164 den. लंगड़् *limp* = Skr. N. लङ्ग, Pr. diminutive लंगड; Pr. लंगडेइ or लंगडइ, H. लंगड़े.

165 den. लव् or लौ *reap* = Skr. N. लव; Skr. लवयति, Pr. लवेइ or लइ, H. लवे or लौए.

166 comp. लुक् *disappear, conceal oneself* = लुप् + क; Pr. लुक्कइ (H. C. 4, 55), H. लुके. The word लुप् properly means "dropping out," "elision"; it is derived from the Skr root लुप् *break.* This original meaning of the root is still preserved by the Pr. लुक्कइ, which means both *break, cut of,* (H. C. 4, 116, where it is said to be =

Skr. तुड्) and *disappear, conceal oneself* (H. C. 4, 56, where it is given as an equivalent of the Skr. निली) *

167 den. लुभाव् or लुहाव् *covet, be enamoured with* = Skr. N. लोभ ; Pr. लोभावइ or लोहावइ, H. लुभावै or लुहावै, (with *u* for *o*, see my Comp Gramm. § 25).

168 der. सज् *be adorned, be prepared*, a passive or intransitive, derived from root साज्, see Appendix No. 24.

169 comp. सटक् or सड़क् *get away, disappear, conceal oneself* = Skr. सच or सद् + क ; Pr. सटकइ or सडकइ, H. सटकै or सड़कै. The word सच means *covering, concealment*. The root सद् becomes सड् in Pr. ; see Vr. 8, 51. H. C. 4, 219.

170 der. सध् *be settled*, a passive or intransitive, derived from the primary root साध् No. 336.

171 den. समुहाव् *be in presence of* = Skr. N. संमुख ; Pr. संमुहावेइ or संमुहावइ, H. समुहावै.

172 comp. सरक् *be moved, move* = Skr. सर + क ; Pr. सरकेइ or सरकइ, H. सरकै. Possibly it is a mere variety of the root सड़क्.

173 den. सराप् *curse*, denom. made from the Hindí सराप a corruption of the Skr. शाप ; see my Comp. Gramm. § 135.

174 der. साठ or साँट् or साँट् *combine*, a transitive or active, derived from the primary root संठ, No. 323.

175 den. सील् *moisten* = Skr. N. शीतल ; Pr. सीअलेइ or सीअलइ, H सीलै. on the absorption of *a* after *i*, see my Comp. Gramm. § 97.

176 der. सुधर् *be correct, mend*, a passive or intransitive, derived from the primary root सुधार्, see No. 346.

177 den. सुहाव् *be pleased* or *give pleasure* = Skr. N. सुख ; Pr. सुहावेइ or सुहावइ, H. सुहावै.

178 den. सुहाव् *be beautiful* or *make beautiful* = Skr. N. सोभ ; Skr. शोभयति, Pr. सोहावेइ or सोहावइ, H. सुहावै. This might, however, be a primary root, from the causal of root शुभ्.

179 den. सूख or सुख् *be dry* = Skr. N. शुष्क, Pr. सुक्खेइ or सुक्खइ, H. सूखै or सुखै.

180 den. सुत् *sleep* = Skr. P. P. P. सुप्त ; Pr. सुत्तेइ or सुत्तइ, H. सुतै.

181 den. सैंत् or सेंत् *adjust* = Skr. P. P. P. समाहित, Pr. समाहित (cf. H. C. 2, 99 निहित = Skr. निहित), Ap. सम्माहित्त or सम्माँहित्त, H. (contracted) सैंत ; whence Pr. समाहित्तइ, H. सैंतै or सेंतै.

182 comp. हग् *evacuate* = Skr. हद् + क ; Pr. हगइ, H. हगै (for हकै) ?

* The root लुक् might also be derived from लुच् + क, from the root लुंच् which (like लुप्) means both *cut off* and *disappear*. Or it might be derived from लुंब् + क ; the root लुंब् meaning *become invisible*.

183 comp. हकाव् or हंकाव् *bawl, drive away* or *keep off* (with shouts) = Skr. हक् + छ; Pr. हक्कावेइ or हक्कावइ, H. हकावै or हंकावै. This is a pleonastic form of No. 187.

184 den. हंकार् *bawl, drive away* or *keep off* (with shouts) = Skr. हक्कार; Skr. हक्कारयति, Pr. हक्कारेइ or हक्कारइ, H. हंकारै. Connected with roots Nos. 183 and 187.

185 हत् *slay* = Skr. P. P. P. हत, Pr. हत्त (like निहित्त H. C. 2, 99); Pr. हत्तेइ or हत्तइ, H. हतै.

186 comp. हलक् *move* = Skr. कल + छ; Pr. हलकेइ or हलकइ, H. हलकै.

187 comp. हाँक् *bawl, drive* (with shouts) = Skr. हक् + छ; Pr. हक्केइ or हक्कइ (H. C. 4, 134), H हाँकै. See Nos. 183, 184. Probably connected with root भण् or भंज or भाष् *talk* + छ.

188 den. हार् *lose, be beaten, be unsuccessful* = Skr. N. हार, Pr. हारेइ or हारइ, H. हारै. H. C. 4, 31 has हारवइ (for हारावइ by H. C. 3, 150), said to be = नश्यति; it is merely a pleonastic form of हारै. Hindí has हरावै or हिरावै.

189 comp. हाँक् *blow* = Skr. धम + छ; Pr. धमकेइ or धमकइ, Ap. धमँकइ, H. हाँकै (for धाँकै). See No. 92.

APPENDIX.—*Primary Roots.**

1 ऐंच् or एँच् *pull, attract* = Skr. आ + कृष्, future आकर्क्ष्यति (used in the sense of the present), Pr. आयंइ or आइंइ (H. C. 4, 187), H. ऐंचै or एँचै (with loss of aspiration). See introductory remarks, pp. 39, 40. This root occurs in the shortened form अंच् both in Pr. (H. C. 4, 187 अंचइ) and in old Hindí (Prithiraj Rasau 27, 38 अंचै); see No. 2.

2 खैंच् or खेंच् or खैच् or खेच् *pull* = Skr. कृष्, future क्रक्ष्यति (used in the sense of the present); Pr. कड्ढइ or कंइ, H. खैचै, खेचै or खैंचै, खेंचै (with transfer of aspiration, see my Comp. Gramm. 132). On the inserted nasal, see *ibidem* §§ 149, 158, H. C. 1, 26, 28. On the change of *a* to *ai* or *e*, see my Comp. Gramm. § 148; here it occurred by assimilation to root ऐंच् or एँच् No. 1. See introductory remarks pp. 39, 40. In old Hindí this root occurs in the form खंच् which is much nearer the original Prákrit form कंइ; and corresponding to it, the old Hindí has a root-form अंच् which has evidently been modified from the original form ऐंच् (see No. 1) in order to assimilate it to खंच्; just as the original form खंच् has

* These are roots which I was at first inclined to consider to belong to the secondary class.

been modified to खैंच in order to assimilate it to ऐंच्. Thus the two forms खंचै and अंचै occur in the Prithiráj Rasau 27, 38.

षां मंगोल ललरी बीस टंकी बर पंचै।
चौतेगो सब्बाज बान अरि प्रान सु अंचै॥ *i. e.*,

"The Mangol Khán Lalarí draws twenty daggers, and the four-sworded Sabbáj pulls out the enemy's life with his arrows."

3 कांड् *vomit, let go, release* = Skr. कृद्, I. cl. कर्दति. Pr. कड्ढ (H. C. 4, 91), H. काँडै. The root is also spelled कांटै; and it might be derived from कृद्, VII. cl. कृणत्ति, Pr कंडइ or कंटइ, H. कांडै or कांटै (as Pr. भंजइ for Skr. भनक्ति). It might also be derived from the Skr. denominative root कर्द्. X. cl. कर्दयति; as it seems to have been done in H. C. 2, 36 (कड्ढ from कर्दि).

4 कप् *be pressed down, be stamped, be printed* = Skr. चंप्, I. cl. चम्पति, Pr. कंपइ, H. कपै. Or perhaps from चम्, IV. cl. चाम्यति.*

5 झांख् or झाख् or झाक् *sigh, chatter* (wildly), *lament, be sorry for* = Skr. ध्यांच्, I. cl. ध्यांचति, Pr. झंखइ (H. C. 4, 140), H. झंखै, झखै or (disaspirated) झकै. As to the change of ध्य to झ, compare Pr. झओ for Skr. ध्वजः (H. C. 2, 27). As to the meaning, compare the English "croak."†

6 झांप् *throw on, cover* = Skr. चप् *throw*, Passive चप्यते (used actively), Pr. झंपइ, H. झांपै. The झ for क्ष is as in झिज्जइ for क्षीयते H. C. 2, 3, and the inserted anusvára, as in जंपइ (H. C. 4, 2. 1, 26, for जप्पइ). Or it might be derived from Skr. अधि + क्ष, Causal अध्यर्पयति, Pr. झंपेइ or झंपइ (for अज्झंपइ, with loss of initial अ see my Comp. Gramm. § 172).

7 टक् *knock, hammer* = Skr. तक्ष्, I. cl. तक्षति, Pr. टक्खइ (with ट for त as in टगरो H. C. 1, 205), H. टकै (for टखै with transfer of aspiration). Compare Skr. टङ्कर. See No. 9.

8 टाँस् *ram, hammer* = Skr. तक्ष्, I. cl. तक्षति, Pr. टक्खइ (as to ट for त, see H. C. 1, 205), H. टाँसै (for ट खै, with transfer of aspiration from क्ष to ट, and change of क्ष to स्, see my Comp. Gramm. §§ 11, 132). See No. 10, also Nos. 7 and 9.

9 टोक् or टोंक् *ram, hammer, drive in,* (nail, &c.) = Skr. त्वक्ष्, I. cl. त्वक्षति, Pr. टुक्कइ (as to ट for त, see H. C. 1, 205), H. टोकै or टोंकै (for टोखै, with transferred aspiration). See No. 7.

0 टोम् or टोंम् *ram, hammer* = Skr. त्वक्ष्, I. cl. त्वक्षति, Pr. टुक्कइ (cf. H. C. 1, 205), H. टोमै or टांमै (for टोखै). See No. 8.

* The root स्पृश् also might produce a Pr. passive (used actively) छप्पइ, analogous to छिप्पइ (H. C. 4, 257).

† This verb is noted by Hemachandra not less than five times; in 4, 140 as = संतप् *repent*, in 4, 148 = विलप् *lament* or *prattle*, in 4, 156 = उपालभ् *scold*, in 4, 201 = निःश्वस् *sigh*, and in 4, 259 = भाष् *talk*.

11 ढाल् or ढार् *send forth, pour out, cast*, a modification of धाड्, No. 14 *q. v.*, cerebralisation transferred to the initial ध from ड्.

12 थप *fix, settle* = Skr. स्तभ्; Passive स्तभ्यते (used actively), Pr. थप्पइ (formed similarly to क्खिप्पइ from स्क्षिप्यते H. C. 4, 257), H. थपै. See footnote on p. 46; भ्य = थ = व्व = प्प.

13 थाप् or ठप् *slap, strike, pat* = Skr. स्तृह्, Passive स्तृह्यते (used actively), Pr. थप्पइ or ठप्पइ, H. थापै or ठपै. See footnote on p. 46; ह्य = भ्य = थ = व्व = प्प.

14 धाड् *send forth, pour out, cast* = Skr. धाड्, I. cl. धाडते, Pr. धाडइ (H. C. 4, 79), H. धाड़ै. See No. 11. The Skr. धाड् is adopted from the Pr., and is probably a denominative of धट, P. P. P. of धज् *glide, flow*, Pr. धड्ड = धड्ड = धाड.

15 फलंग् *leap* = Skr. प्र+लंघ्, I. cl. प्रलंघति, Pr. पलंघइ, H. फलंगै (with transfer of aspiration).

16 फेंक् or फौंक् *hurl, fling, throw away* = Skr. प्र-क्षिप्, Future प्रेक्ष्यति (used in sense of present), Pr. पेक्खइ or पेंखइ, H. फेंकै or फौंकै (with transfer of aspiration).

17 बिन् *weave* = Skr. इ, IX. cl. इणाति, Pr. विणइ, H. बिनै; see No. 19; also No. I, 237. The Skr. root for *weave* is वे, I. cl. वयति or IV. cl. ऊयते; it seems impossible to derive the H. root बिन् from it; but the roots इ and वे are probably connected; both mean *cover*.

18 बिछ् *be spread* = Skr. वि-स्तृ, Passive विस्तिर्यते (for विस्तीर्यते; like क्रियते, त्रियते), Pr. विच्छेइ or विच्छइ, H. बिछै. Compare Pr. विच्छिन्न in Chanda 2, 21 for Skr. विस्तीर्ण.

19 बुन् *weave* = Skr. इ, V. cl. इणोति, Pr. वुणइ, H. बुनै, formed like सुन् No. I, 347. See No. 17.

20 बोझ् *load* = Skr. वह्, Passive उह्यते (used actively) or Causal Passive वाह्यते, Pr. वुब्भइ (cf. H. C. 4, 245 वुब्भइ), H. बोझै.

21 भीज् or भींज् *be wet* = Skr. अभि + अंज, Passive अभ्यज्यते, Pr. अब्भिज्जइ, H. भीजै or भींजै (with loss of initial अ; see secondary root भीग् No. 140).

22 भूंक or भोंक् or भौंक् *talk foolishly, bark* = Skr. भष्, Future भक्ष्यति, Pr. भक्कइ (H. C. 4, 186, with disaspiration for भुक्खइ), H. भूंकै, &c. The original aspirate form भोखै occurs in Hindí. There is an identically spelled root, meaning *thrust, drive*, which probably has a different origin and may be a compound root.

23 भेज् *send* = Skr. अभि + अज्, Passive अभ्यज्यते (used actively), Pr. अब्भिज्जइ, H. भेजै (with loss of initial अ and change of *i* to *e*, see my Comp. Gramm. §§ 172, 148. As to the change of *ya* to *i*, see *ibidem*, § 121.

24 माज् *adorn, prepare* = Skr. मंज्, Passive मज्यते (used actively), Pr. मज्जइ, H. माजै. The Skr. root मज् has been adopted from the Prákrit.

ABBREVIATIONS.

Bs. = Beames' *Comparative Grammar.*
Cw. = Cowell's edition of the *Prákrita Prakáśa.*
Dl. = Delius' *Radices Praecriticæ.*
E. M. = E. Müller's *Beiträge zur Grammatik des Jainaprákrit.*
H. C. = Hema Chandra's *Prákrit Grammatik* (ed. Pischel).
K. I. = Kramad Iśvara's *Prákrit Grammar.*
R. M. = Dr. Rajendralala Mitra's *Prákrit Vocabulary.*
S. B. = Setubandha (ed. S. Goldschmidt).
S. C. = Śubha Chandra's *Prákrit Grammar.*
S. Gdt. = S. Goldschmidt's edition of the *Setubandha.*
Spt. = Saptaśataka des Hála (ed. A. Weber).
T. V. = Trivikrama's *Prákrit Grammar.*
Vr. = Vararuchi's *Prákrit Grammar.*
Wb. = Weber's edition of the *Saptaśataka.*

G. = Gujarátí. S. = Sindhí.
M. = Maráthí.

Coins supplementary to Thomas' Chronicles of the Pathan kings.—By C. J. Rodgers.

(With two Plates.)

The "Chronicles of the Pathan kings" is a very full work. But it is an enlargement of a smaller previous work. Further search brought more coins to light, and the description of these coins has swollen the original treatise to its present size. But large though the work be, it is not *exhaustive.* Finality in our knowledge of the coins of the Pathans has not yet been attained. Continued search will bring out still further coins which from time to time will have to be described. Owing to the nature of my duties I have few opportunities of obtaining fresh coins, but as I have during the past year come across about forty unpublished ones, I thought I might venture to put them forward as a small contribution to a further knowledge of the coins of India.

The word *a'dl* figures largely on the coins of the Gazní rulers. In some modern coins this word occurs together with the sword on several coins of towns in Afghanistan. It must have been for the reason, that might is right, that the early conquerors of India stuck this word on their coins. In Plate V, Nos. 1 and 2 have *a'dl* on the obverse and *mumallikí* on the reverse. I am inclined to ascribe this coin to *Muhammad Sám* and his general *Eibek.* The word I have transliterated as *mumallikí* may be *mumlakat.* No. 6 I regard as a coin of Muizz-ud-dín Muhammad Sám. The word Muizz on this coin is written more like the same word on the coins of Eldoz and of Muhammad Sám, than that on the coins of Muizz-ud-dín Kaikubad or Muizz-ud-dín Bahram Sháh. There is a coin in the "*Ariana Antiqua,*" Pl. XX. fig. 14 which is not mentioned by Thomas. Now I got a good specimen of this same coin from Neshápúr with a lot of the coins of A'la-ud-dín Khwárizmí. A glance at No. 15

of Plate V, will show that this very king A'la-ud-dín struck coins of the very same type, using the square area for his name and titles and dividing the latter similarly to Muizz-ud-dín. No. 7, Pl. V, I claim also for Muhammad Sám. It has Muizzí on obverse and on reverse in Hindí, Srí Samanta Deva.

Nos. 3 and 4, Pl. V, are undoubtedly new types of Shams-ud-dín Altamsh. No. 3 has obv. *a'dl*, rev. *Shamsí*. No. 4 has the same with a star underneath each word. Neither has any ornament.

No. 9 is, I believe, also Shams-ud-dín's. The star seems to indicate this. *A'dl i Sultan ul Muazzim*, the inscription on the obverse is found also on a large quantity of coins of size similar to this one of which Thomas takes no notice. But the *Zarb ba Lahore* with star above it is not on them. They have always *Zarb ba hazrat Dehli*. No. 9 is to me unique. But the other kind I mention are very common indeed. In my own small collection I have no less than 12 duplicates. One of them has *A'dl i Sultán i Muazzim ;* the *alif* and *lám* are altogether missing.

No. 10 is undoubtedly Shams-ud-dín's coin. *Obverse : A'dl us Sultán (ul A'zim) ; Reverse : (Sha)ms ud Dunya (wa) ud dín.* This is a very coarse coin.

Nos. 11, 12 and 13 are I think Shams-ud-dín's. The obverse and reverse are simple *A'dl* and *Dehli*. No. 11 has these words in square areas ; No. 12 in round ones with ornaments ; No. 13 in a hexagonal star, with dots in the angles.

No. 5 is a very rare coin weighing only the same as No. 109 in Thomas, and half the weight of his No. 52, the inscriptions of which latter coin it possesses. So we may regard this coin as the smallest hitherto discovered of Shams-ud-dín's. It is exceedingly rare as is the one double its size. Thus in all I have had the pleasure of unearthing no less than 10 new types of coins of Shams-ud-dín.

No. 8 I ascribe to *Reziah*. In the rayed circle is the name *Reziah*. On the reverse is the *bull* with Samanta Deva above it in Hindí. The whole coin is similar to No. 7 of the same plate.

No. 14, Plate V is evidently a coin of the same king the No. 1 belongs to. And No. 15 is obv. *A'la ud Dunya*, rev. Wa ud dín. Th is a coin of A'la ud dín Khwarizmí. No. 14 has similar inscriptions those on No. 5 ; but the fortunate discovery of No. 15 settles the ascri tion.

No. 16 is a new coin of the same king. In the central area is the wo *Sultán* and on the margin *Ul A'zim A'la ud Dunya wa ud dín Muham mad (bin us Sul)tán.* Reverse : the Kalimah. The whole is in Kufic characters.

Not one of these three coins is in the British Museum or is noticed by Thomas.

No. 17 is a coin of Fíroz Sháh Zafar, son of Fíroz Sháh. The obverse has on it in square area Fíroz Sháh. The margin reads *Zafar ibn Fíroz Sháh Sultán*, the reverse has *náib i amir ul Mominín* 791. No. 18 is exactly the same in date and inscriptions, but the latter are arranged differently on the obverse. *Zafar* beginning above the area and not on the left hand side as in No. 17. They are both of silver and copper. This Zafar Kháu, son of Fíroz Sháh, died in Gujrát in 775, A. H. But he had a son also named Zafar Khan, and this coin may have been struck in his honour after the death of Fíroz Sháh.

No. 19 is a coin of Muhammad Shah, son of Fíroz Sháh. It is not in Thomas in this size. This coin is very light. In reading the margin of the large coin of this type, Thomas omits the word *Sultán* which is always on the best preserved specimens. The centre area is *Muhammad Shah.* The margin reads from the outside and is *Sultán, zarb bahazrat i Dehli.* The reverse of this coin is Naib i Amír ul Mominín 792.

No. 19*a* is a coin of similar type without any date on the reverse. Inasmuch as the margin of this coin reads from the inside, I am inclined to ascribe this to Muhammad bin Farid Sháh, whose coins, when similar in type to the coins of the son of Fíroz, have always some difference in the arrangement of the words.

No. 20 is a coin of Muhammad Sháh son of Farid Sháh. The inscriptions are, obverse *Sultán Muhammad Sháh, Farid Sháh zarb Dehli.* Reverse *Khalifah Amír ul Mominín Khallad Khiláfotahu.* There is no date. There is some uncertainty as to the date of the death of this king. Thomas, quoting *Badaoní*, gives his death as 847. I got a coin of this king's during the time this plate was being prepared, dated 848. But this does not prove much; for from the time of Fíroz Sháh, the mints kept on coining in the names of kings who had been long dead; *e. g.*, Mubárak Sháh died in 837. And I have coins bearing the date of 840 and 854. A whole series of posthumous coins of these kings might easily be made.

No. 21 is a coin of Bahlol Sháh. The inscriptions are, substituting *Bahlol Sháh* for Muhammad Sháh, similar to those on the last coin. Coins bearing these inscriptions are somewhat rare in the smaller size. This large-sized coin is to me unique, and it has not as yet been published. This is the third new type of Bohlol's that I have brought to light.

No. 22 has no business in this plate. It was put in to fill up a gap, and because I saw that the coin is new to numismatists, as it is not in the British Museum Catalogue or in Thomas' work on the Gazní coins. It is a binominal coin, struck evidently by Bahrám Sháh. Obverse:—*A'dl us Sultán ul Azim Bahrám Sháh.* Reverse:—*A'zd us Sultán ul Muazzim Sanjar.* Here Bahrám seems to arrogate to himself the title of *A'zim* "the greatest" and to give his ally (A'zd) Sanjar who had helped him to retain

his throne only the title *Muazzim* "the great," or "great," simply. Grammatically there is an apparent slight, but conventionally the title of Sanjar is as honorable as that of Bahrám. There is a difference, we know, for Muizz ud din Muhammad bin Sám during the lifetime of his elder brother Gyás ud dín Muhammad bin Sám always used in his coins *Muazzim* for himself, until his brother's death when he took the title *ul A'zim*. But as I have shown above, Shams ud dín used the title *Muazzim*, as did also *A'la ud dín Masaud*; for I have two unedited small coins of his. Some two months ago I came across a find of Gazni coins in the Umritsur bazaar. There were about 500 in all. They contained several new types of Masaud III, Malik Arslán and Bahrám Sháh. The present war should cause some thousands to be unearthed and we may expect novelties for some time to come.

I now proceed to examine the coins in Plate VI. The first one is a small *Kashmiri* coin with the date (8)74 on it. It is a coin of Haider Sháh and confirms my statement in my paper on the Kashmir Sultans, that this king was reigning at that time, although his accession is usually marked in 878.

Nos. 2 and 3 are very pretty little novelties, of Muhammad Sháh and Sikandar Sháh. They are of copper. Obverse:—names of kings. Reverse:—the title *Sháh*. They are much smaller than Gyas ud din's coins with similar inscriptions. They were evidently a revival of the small coins of Shams ud dín and Nasir ud dín Mahmúd and Muizz ud dín.

Nos. 4 and 5 are two anonymous coins of Humáyún, bearing the date 946. No. 4 was struck at Agra.

No. 7 a rupee, full sized, of Humáyún's, struck after his return in 962. It resembles very closely, in its get up, the rupees of Muhammad Súr. As yet all the silver coins of Humáyún which have been described have been thin and light, after the fashion of the *tankahs* of Central Asia. The inscriptions are very distinct. Obverse Area:—*Muhammad Humáyún. Bádsháh Gází* 962. Margin:—*Us Sultán ul Adil Abú ul Muzaffar, Zarb (Dehli?)*. Reverse Area:—*the Kalimah*. Margin;—names and titles of the four companions of Muhammad.

No. 8 is a rupee of Muhammad Sháh of Bengal. Obverse Area:—*Muhammad Shah Sultan Gází, Khallad allah mulkahu wa Sultanahu*; margin:—*Shams ud Dunya wa ud dín abu ul Muzaffar, Zarb, Satgáon*. Reverse Area:—*the Kalimah*, with a star; margin:—the names of the four companions and their titles together with the date 962. There is a difference between the titles of Umr in the above two rupees. In Humáyún's it is Al Fárúq, in the Bengal one *al Khattáb*.

No. 9, a new type of Baber's silver coins. It is of the tankah kind, but of uniform thickness and well struck, unlike most of the coins of

Baber. Obverse :—*Zahír ud dín Muhammad Bábar, Bádsháh Ghází* (9)37. *Khallad allah mulkahu wa Sultánahu, zarb Agrah.* (The bars and knots are not peculiar to the Kashmir coinage. They are found on the anonymous coins of both Baber and Humáyún). Reverse Area :—*the Kalimah ;* Margin :—names and titles of the four Companions.

Nos 10, 11, 12, are three varieties of a new type of Humáyún's anonymous coinage. They were all struck at *Champánír.* Firishtah spells this word چانپانیر. The coins all agree in giving it حسانیر. The inscriptions of these coins give a new feature—a title to a city. Champánír is entitled the noble city *Shahr i Mukarram.* It speaks well for Humáyún's nature that he could so style a city he had just conquered ; for the date of the coins is that of the conquest of the city 942. These coins too introduce a second new feature in Humáyún's anonymous coinage. Instead of *Fí ut táríkh,* they have *ba táríkh.* Obverse :—*Zarb Shahr i Mukarram.* Reverse :—*Champánír ba táríkh* 942. No. 11 belongs to Dav. Ross, Esq.

No. 13 is another of the anonymous coins of either Baber or Humáyún. I give it for two reasons: (1) It has full inscriptions. (2) The bar running across the Jauñpur anonymous coins resolves itself into a word *Mutabarrak,* the title of the city—*the Blessed.* Obverse, *Ba Dár ul zarb Khitta i Jaunpúr Mutabarrak.* Reverse :—*Fí ut táríkh san* 937 ; ornaments at the top and bottom. Most of the coins of Jaunpúr have a star on the obverse of one kind or other. But all have the bar, with the first letter and last one missing. All I have, have *dar ul zarb* on them too, although this is omitted by Thomas. The bars on some of the other anonymous coins may by the discovery of fuller specimens turn out to be some words or other.

Nos. 14, 15, 16, 17 and 18 are small copper coins of the Súrí family, forming of themselves a little set, out of which only one, No. 17, has been noticed by Thomas. No. 15 is the first of the set. Obverse :—*Khalífah uz Zamán* 947. Reverse :—*Sher Sháh us Sultán.* This is a very small coin indeed for Sher Sháh.

No. 16 is also Sher Sháh's, but it is larger and heavier than 15 and has a different inscription. Obverse :—*Sultán Khalífah uz zamán,* Reverse :—*Sher Sháh ul A'dil Sultán.*

No. 17 is Islám Sháh's, noticed by Thomas, No. 364, p. 413. I have given it here to complete the set at one view. No. 18 is Muhammad Sháh's Súrí. Obverse :—*Sultán Muhammad A'dil Sháh :* Reverse :—*Khalífah uz zamán Abú (ul Muzaffar).*

No. 14 is Sikundar Súrí's. Obverse :—*Khalífah uz zamán* 962. Reverse : *Sikandar Sháh us Sultán* 962. Thomas does not notice any *halves* of the large copper coins of any of the five Súrí kings. Halves of Sher Sháh are common, those of Islám Sháh are rare, those of Muhammad Ádil

Sháh are extremely rare, while I have only seen one of Ibrahím Sháh and not one of Sikandar Sháh's. General Cunningham had a large copper one of Sikandar Sháh. Mr. Delmerick published one of Ibrahím's. The large coins of the other three are common, the greater numbers of course being Sher Sháh's and Islám's. I have not as yet come across a small coin of Ibrahím's. This is one of the things I am looking for. The Sikandar Sháh, whose coin is given in this plate No. 2, I believe to be the one who reigned in 795 for 45 days. A comparison of this coin with No. 275, p. 311 of Thomas, of which I have a most perfect specimen, leads me to this conclusion. Now if a king who reigned only 45 days could in that short time get out no less than *five* kinds of coins, I think we have a right to look out for the same number of varieties in the coins of kings who reigned longer. Scientific and systematic search with duly chronicled results ought to lead to much fuller knowledge respecting the coins of the Pathán's and their successors, and indeed with respect to the whole of the coins of the Empire of India from the time of Alexander the Great and Chandra Gupta to the times of Her Most Gracious Majesty the Empress of India and Queen of England.

As old coins are found, they find their way into the bazaars, where, if there is no purchaser at other than bullion rates, they are ruthlessly melted down, the silver being good, in order to supply metal to the makers of jewels. In this way undoubtedly thousands of coins disappear annually of which our museums and cabinets are standing in need. Meanwhile inasmuch as no Indian museum has its coins catalogued, no one knows what any collection may contain or may be in need of. Collectors would undoubtedly often present coins to museums which want them, if these wants were known. Students cannot use our Indian museums profitably until they know what the museums contain: and yet the end and object of all museums is an educational one. Hence I cannot help bringing this matter forward as one of the greatest importance in making our museums more useful in the promotion of historical studies.

Several other new varieties of coins including a rupee of Shams ud din Altamsh, a tankah of silver of the same king with *rays* round one side to represent *the sun* (Shams), a new variety of Reziah's and one of Kutub ud din Mubárak Sháh's together with several others must stand over to a future paper, in which I hope to be able to show that No. 158, p. 190 of Thomas was struck in *Tulang* (Telingana), just the same as No. 11 of Plate IV of the Society's Journal of last year.

Memorandum on Coins of the Sunga Dynasty.—*By* H. Rivett-Carnac, Esq., C. S., C. I. E., F. S. A.

(With three Plates.)

I have to offer a few remarks on some more coins of the Sunga Dynasty submitted for the inspection of the Society.

Plate VII, No. 1 is a coin of quite a different type from those already sent. Mr. Carlleyle reads the inscription on it as *Ramadata.*

No. 2, A and B are 2 small coins with the legend *Achya* or *Bhanya.* (Mr. Carlleyle.) On the other side is what looks like the Buddhist wheel.

No. 3. The legend on this coin of *Bhanu Mitra* corresponds with that on the large coins already submitted to the Society and described by Mr. Carlleyle. The shape of the coin is, however, different, and a figure which Mr. Carlleyle takes for the Nirvána has been stamped in above the legend. There may, however, perhaps be some doubt whether this is intended for a recumbent figure of Buddha. It looks indeed more like a standing female figure on a low platform, a figure somewhat resembling that on the coin of Phaguni Mitra to be noticed later.

No. 4 is a similar coin. The legend not being in quite such good preservation.

No. 5 is a coin of *Agi* or *Agni Mitra* of the same type. In this specimen, however, the figure would seem to be that of a female, the bosoms being distinctly shewn. It is not unlike the rough representation on the Kanauj series of coins, see Plate XXIV, Vol. I, Prinsep.

No. 6, A, B, C are 3 small coins of the same type. The figures are distinct enough, but the inscription in each case is undecipherable.*

I have already sent to the Society, in illustration of Mr. Carlleyle's paper, specimens of each of the various coins of the Sunga Dynasty. The specimens sent were specially selected on account of the legend and the marks stamped on the obverse. The design on the reverse is hardly of so much importance, but it may be interesting to notice the Monogram or device chosen by each king. From a large number of specimens I have selected those now sent to illustrate as far as possible these points. Unfortunately none of the specimens are in very good preservation. The coins when found looked most hopeless. (See No. 7 specimen in its original condition now sent.) But by a careful process of boiling and cleaning the legends and stamps on the reverse have been rendered sufficiently clear.

* [They are probably coins of *Súrya Mitra*. On No. 6 B, the letters *s*, *y*, *m*, and on No. 6 A, the letter *s* can be distinguished. Ed.]

It is a curious fact that in hardly any case has it been possible to preserve the design on the reverse. Under the process of cleaning, what I may call the back of the coin has almost invariably flaked away. And this will hardly be wondered at when the condition in which the coins were originally found is seen.

The devices of the different monarchs may be noticed as follows:

Bhumi Mitra. The coins of this king, besides being very numerous, are nearly all in fairly good preservation. The device on the reverse is distinct. A standing figure on a platform, between two poles or pillars of victory, or whatever they may be called, each staff surmounted by three cross-bars, and the head surrounded by rays or flames. In the specimen No. 8 the figure holds what looks like a snake in its hand. The snake or line is not so distinct in all the coins (see Nos. 9, 10).

Agi or *Agni Mitra.* The coins numbered Nos. 11, 12 in Plate VIII bear nearly the same device as those of *Bhumi Mitra.* And of this king also it is to be noticed, that the coins, besides being numerous, are, comparatively speaking, in excellent preservation. Here also is a figure with rays or flames issuing from the head. This figure also stands on a platform between poles or staffs of victory. But in this case each staff is surmounted by what looks like a thistle or a *ghara*, whereas in *Bhumi Mitra's* coins at the summit of each staff are, as already noticed, three cross-bars. The smaller of *Agni Mitra*, Nos. 13, 14, 15, exhibit a different device. The standing figure has in its hand what would seem to be a snake. There are no square platform and no side poles. At the base are rays or flames.* In fact the device is nearly the same as that on the coins of *Phaguni Mitra* now to be noticed.

Phaguni Mitra, Nos. 16, 17, 18, 19. These coins also are numerous and fairly well preserved. The device shews a standing female figure surrounded by what look like rays or flames.* In the right hand is a club (?), lower down and also on the right side a device or monogram is clearly distinguishable.

The coins of *Bhadraghosa*, *Surya Mitra* and *Bhanu Mitra*, which, together with *Phaguni Mitra*, are, I understand, not only new coins, but also record the names of kings hitherto unknown, are much less numerous than those first noticed and are not generally in such a good state of preservation as those of *Bhumi*, *Agni* and *Phaguni*. Those of *Bhadraghosa* indeed are in most cases scarcely legible. And had it not been for the beautiful little specimen which came into my hands before the find in Bareilly, there might have been some difficulty at first in establishing the legend on these

* [The base rather resembles the lotus-seat on the reverse of some Gupta coins. Ed.]

coins. Not one single specimen shows, with any distinctness, the design on the reverse. Two of the best in this respect that I have, are marked Nos. 20, 21. On these a female figure, resembling that on the coins of *Phaguni Mitra* can just be made out.

Bhanu Mitra. The device on Nos. 22, 23 is tolerably clear. The sun with pointed rays surmounts a semicircle which may be intended to represent a serpent. Below is what may be taken for a squat figure supporting the sun (?) but the device is perhaps hardly sufficiently distinct to admit of any very satisfactory conclusion being drawn. This may possibly be aided by coins of other types in the possession of the Society or figured in books which are not at my disposal.

Surya Mitra, Nos. 24, 25. Here, as the name denotes, is the sun surmounting what would seem to be a triangular-shaped altar with the staff of victory on either side. Here also the staff has the cross-bars as in *Bhumi Mitra's* coins.

To these I have added a coin of *Indra Mitra*, No. 26, similar to those already sent. This coin has I believe been found before. The device on the reverse is somewhat different from those already noticed, and shows a standing figure on a square platform, like that on the coins of *Bhumi* and *Agni Mitra*. In the right hand of the figure is a sceptre? The Staff of Victory noticed in the other coins is wanting here.

It will be seen that of the seven kings whose coins are noticed above, six of them adopted a different device. As regards the coins of *Bhadraghosa*, it is not possible to speak with certainty. It will be noticed too that these six *Mitras* have all included the sun, or the rays of the sun on their coins, suggesting possibly their *Mitra* or *Mithraic* origin. The symbols on the obverse of the coins have been described by Mr. Carlleyle, and in all cases the design is the same or nearly the same. There is little or no difference in the shape of the letters used. The legend is surmounted by three symbols which are in all cases the same, although in the coins of *Bhadraghosa* and *Bhanu Mitra* the central symbol appears to have been punched in separately. All this would seem to suggest that these seven kings belong to the same dynasty. Mr. Carlleyle has attributed them to the Sunga kings, who, according to Prinsep and other authorities, commenced to reign over Magadha about 172 B. C.

I shall be glad if the Society can afford me any information regarding these kings—the succession in which they reigned and the probable dates of the coins.

In Prinsep's list *Agni Mitra* appears next after *Pushpa Mitra* the first of the line. And this arrangement coincides with that given by Wilford and others in the Asiatic Researches. If the condition of the coin and the quantity in which it is found are of any significance, then *Agni*

Mitra might fairly be supposed to be one of the most recent of these kings.

I have no suggestions to offer regarding any of them, save *Bhadraghosa*. It will be seen from Prinsep's list and also from Wilford's Essay in Asiatic Researches, Vol. XI, that one *Ghosa Vasu* preceded *Vajra Mitra*. Regarding this *Vajra Mitra*, Wilford in his Essay on Vikramaditya and Salivahana (see Asiatic Researches, Vol. IX, page 115,) writes as follows: "The first Vicramáditya is mentioned in the Cumáricá-c'handa; in which it is declared that after 3020 years of the Cali-yuga had elapsed, then would Vicramárca appear. He reigned fourteen years, and of course died in the year 3034, when the era of Yudhishtir ended and his own began. In the list of the kings, who were to appear in the Cali-yuga, to be found in the Bhágavata, Brahmánda, Váyu and Vishnu Puránas, there are two kings, the seventeenth and eighteenth in regular succession from Chandragupta, who reigned seven years each. The first is called *Vicrama*, and the other *Mitra*; and they are supposed to have been originally meant for *Vicrama mitra* who, according to some, reigned fourteen years; and in these lists, the father, or predecessor of Vicrama, is called *Ghosha Rája* or the king of thickets, which is another name for Gandharupa, or Gadhá-rája in the west. This looks like an interpolation; and the more so, as it will appear hereafter, that Ghosha-Rája died in the year 440 of our Era."

The Vajra Mitra of Prinsep's list is here supposed to be Vikrama Mitra or Vikramáditya, whose father and predecessor is Ghosa Rája. Wilford thinks that this name Ghosa looks like an interpolation. But perhaps the discovery of a coin belonging to this period, bearing the name of Ghosa, may help to establish the correctness of the entry?

It is perhaps also worthy of notice that Prinsep's list of the Kanwa Dynasty gives the name *Bhumi Mitra*, a contemporary of Vikramáditya. The coins of *Bhumi Mitra* and *Bhadraghosa* are certainly of about the same period, and possibly of the same dynasty. I am aware that since Wilford and Prinsep wrote, Mr. Thomas, General Cunningham and others have done much to clear up the doubts existing in respect to early Hindú Chronology. I am in hopes that those who are better informed than myself on the subject may be able to draw some practical conclusion from the coins which I have been able to collect.

I may add that the mass of them have now been tolerably well cleaned. They have been carefully examined and read by Mr. Carlleyle and myself, but no new types save those sent to the Society have been found. They are entirely at the disposal of the Society if they wish to see them, and I hope that a complete set may be accepted for the Society's Museum. The only reservation I have to make is, that a complete selection of the best specimens should be reserved for the British Museum, which Institution ought, I think, to have the first choice.

The two Maps and Plate XV will be issued with No. 4.

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL,

Part I.—HISTORY, LITERATURE, &c.

No. III.—1880.

Remarks of the Afghâns found along the Route of the Tal Chotiali Field Force, in the Spring of 1879.—*By* Lieut. R. C. Temple, B. S. C., F. R. G. S., M. R. A. S., &c. (With 3 Plates and 2 Maps.)

Part I.

This is the last of a series of papers on the march of the Tal Chotiali Field Force in the spring of last year, and closes my observations on the subject.* As the range of observations to be made along an entirely new and unknown route such as this is necessarily large, I found it impracticable to connect them all into one paper, and this has obliged me to repeat in the several papers certain remarks which were necessary to the exposition of the subject-matter of each, and I trust therefore to be excused for repeating here much that is to be found elsewhere. I have also again to make

* Journal of the march of the 2nd Column of the Tal Chotiali Field Force communicated to the Quarter Master General in India.

An account of the march of the 2nd Column Tal Chotiali Field Force, to the R. G. S., with map.

Sketch Map of the march of the Tal Chotiali Field Force, published by the Surveyor General of India.

Notes on the Formation of the Country passed through by the Tal Chotiali Field Force, and Rough Notes on the Distribution of the Afghân Tribes about Kandahar, to this Society.

the excuse to be found in all my papers on this subject that my notes were from the nature of the circumstances under which they were made necessarily of a rough and hurried kind and contain doubtless many mistakes, but as it seems the route is to be abandoned, it is likely to be a long while before it is again traversed throughout, and I hope therefore my notes will be found to be of value.

The geography of the route, thanks to the exertions and reports of the officers of the Survey of India* who accompanied the Force, is now well known and needs no remark here. Suffice it to say that the Force was sent from the Pishin valley towards Dera Gházi Khán viâ the Kákar country and Ba'rkho'm to open up what is known as the Tal Chotiali Route, and that the present writer was attached to the 2nd or principal column of the Force. The route taken and referred to herein is shewn in detail in the map attached, which was published for me by the Surveyor General of India, and in its general aspect in the map attached to my paper on the Geology of the Route in a former number of this Journal.†

II. *The Tribes en route.*

Before proceeding to discuss what was seen of the various tribes of Afgháns along this march, it may be as well to give a brief account of what is known of the vexed question of the origin of the Paṭhán and Afghán Tribes.

The people of the nation known in India as the Paṭhán Tribes call themselves Bani' Isra'i'l or Pukhtu'n (pl. Pukhta'na), and the Afgháns, as a race of these Paṭhán Tribes, claim descent from Ta'lu't‡ or Sa'ru'l (the Saul of the Bible) as their ancestor. According to native accounts Sa'ru'l had two posthumous sons Baraki'a (Barachiah) and Irami'a§ (Jeremiah), both born in the same hour of different mothers of the tribe of La'wi' (Levi). They rose to high postitions under David, Saul's successor; thus Barakía became prime minister and Iramía Commander-in-Chief. In Sulima'n's (Solomon's) time they were succeeded in their posts each by his son, Barakía by Asaf and Iramía by Afgha'na, and Afghána is said to have had the building of the Baitu-l-muqaddas or Temple of Jerusalem. Asaf left 18 and Afghána 40 sons, and these founded important families or tribes. When the Baitu-l-muqaddas was destroyed by Bakhtu-n-nasr (Nebuchadnezzar) the Afghána Tribe, adhering to their forefathers' religion, were banished from Sha'm (Palestine) and took refuge in Kohista'n-i-Ghor and Koh-i-firoza. Here their neighbours called them Afghán (or Aoghán)

* J. A. S. B., for 1879, paper by Major Waterhouse.

† J. A. S. B., for 1879, Vol. XLVIII, Part II.

‡ Raverty. Gram. of Pushto. Introd. 1860.

§ Birkiya and Armiah according to Raverty.

or Baní Isráil. From Ghor by degrees the Afgháns extended to the Kohista'n-i-ka'bul, Kandaha'r and Ghazni.

Until the advent of Muhammad the Afgháns followed the religion of the Pentateuch or Taurat Khwa'n. But in the 9th year of the announcement of Muhammad's mission they heard of him from one of the Baní Isráil by name Kha'lid-bin-(or ibn)-Wali'd. A deputation was sent to Medina under one Kais (also Kish, Kesh or Kaish) a leading Afghán, who became a zealous Muhammadan and received several special marks of the Prophet's favour, among which the title of malik or king, originally conferred by the Almighty on Saul, their great ancestor, was conferred individually on the Afgháns.* Arabic names also were given them; thus Kais was called Abdu-r-rashi'd (Servant of the Wise). And to him was also given the title of Pihta'n (Paṭha'n) meaning in Syriac a rudder, signifying that he, Kais, was the pilot of his people. From this Kais are descended all the Afghán Tribes properly so called, and all Afgháns are Paṭháns, the name by which the nation is most generally known in India. But there are many tribes who are Baní Isráil and Pukhtún (Pukhtána) who are not Afgháns.

The Pukhtún, erroneously known in India as the Paṭhán Tribes, then are divided into those descended from Kais and those who are not. Those who are so descended are generally known as Afgháns and the others as merely Paṭháns, though the whole nation is also known as Paṭháns.†

The following is a list of the principal tribes of the present day generally acknowledged to be Afgháns:

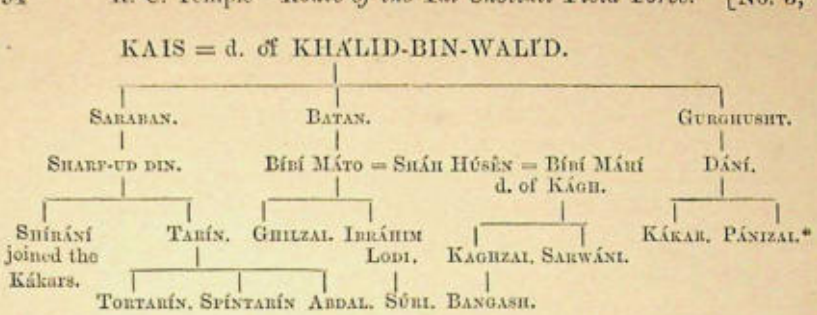
1. Duránis.	8. Túris.	15. Mangals.
2. Taríns.	9. Zaimukhts.	16. Jadráns.
3. Kákars.	10. Orákzais.	17. Shinwáris.
4. Ghilzais.	11. Dáwaris.	18. Mómands.
5. Povindas.	12. Khóstwáls.	19. Yúsufzais.
6. Waziris.	13. Afrídis.	(Kóhistánis.)
7. Shiránis.	14. Tájis.	

Kais married a daughter of Kha'lid-bin-wali'd by whom he had three sons, Saraban, Batan and Gurghusht and from them descend some of the principal tribes above mentioned, as may be seen by the accompanying genealogy.

* At the present day the head of a Paṭhán family or tribal subsection is called malik.

† There are several legends to account for the names of Afghán and Paṭhán, that above given in the text is the commonest. The following are, however, worth noticing.

The word Pukhtún (Pukhtána) is said variously to be of Ibra'ní or Ibra'himí (Hebrew) and of Su'ria'ní (Syrian) origin, and to signify "delivered" or "set free."



The above genealogy which must of course be taken for what it may be worth, includes a good many of the ancestors of the present Afghán Tribes, but not by any means all. Each, however, has its own genealogical legend. It will be observed that the Duránis, the chief or largest tribe are not included in the above genealogy.

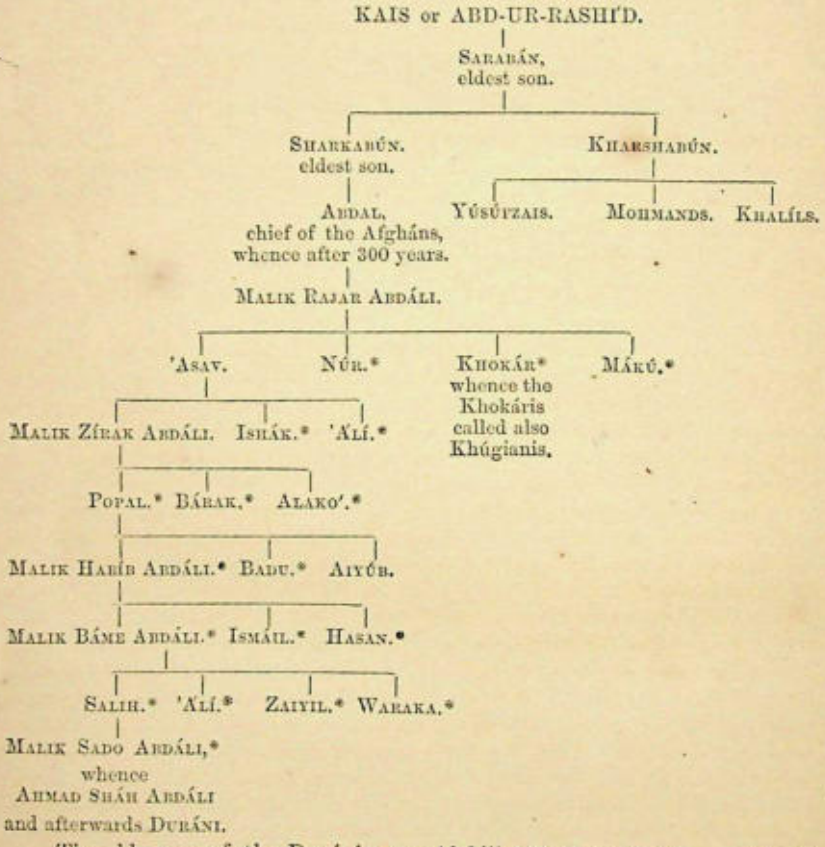
The Paṭhán Tribes we have to deal with in this paper are the Duránis slightly, and with the Tarins, Kákars, Lúnis and Zarkháns more fully. Of

The common tradition about Afghán is, that the mother of their ancestor Afghána gave him the name because of her exclamation on the favourable answer to her prayers in the pangs of childbirth for a quick delivery, for she said on the birth of the child, "Afghána (I am free)," this being the traditional interpretation of the expression. Another tradition is, that she called out in her pangs "AFGHÁN" or "FIGHÁN" an expression of pain in the Persian language. According to the Kákar legends "Paṭhán" is a corruption of PRET KHÁN, the title given to the KAIS above mentioned by the Prophet. Raverty in the Introduction to his Grammar of Pushto gives an extract from the TAZKIRÁT-UL-MULÚK or History of the SADDOZAIS according to which the words PUSHTO (or PUKHTO) and PUSHTÚN (or PUKHTÚN) are derived from PUSHT or PASHT the name of the place Afghána first fixed on as his residence on leaving Palestine. In the same work a characteristically oriental derivation of the word Afghána is thus given. "The original meaning of Afghánah is fighán, a Persian word which means complaint, lamentation, because he (KAIS) was a cause of lamentation to the devil, the jinns and mankind. From the constant use of the word the vowel point *Kasrah* was dropped after which the other letters could not be sounded without the aid of a vowel and *alif-i-wasl* was placed before the *gh* and thus made Afghánah." And the term Paṭhán is further derived from batán or patán which in Arabic (بطان) signifies the keel (Raverty says keelson) of a vessel, "without which it cannot sail, neither can the ship of war sail along without the keel of battle."

* The true Afghán descent of the posterity of the 2nd son BATAN is more than doubtful. It appears that Bíbí Máto (or Mátu) the daughter of Batan formed an illicit connection with Sháh Huscin, (or Hússén, called also MAST'ALI) a Persian Prince of Ghór and was made to marry him. The offspring resulting was named Ghalzai that is "the child of theft." She, however, also bore him a son Ibráhim Lódi from whom the former Paṭhán rulers of Delhi sprung. This Sháh Hussein was also by a fraud induced to marry Bíbí Máhi (or MIHI) daughter of the KÁGH or bard who managed his marriage with Bíbí Máto, and from her are descended the present Kághzai, Bangash and Sarwáni Paṭháns.

these the Duránis, Taríns and Kákars are Afgháns proper and so probably are the Lúnis, but the Zarkháns are merely known as Paṭháns.

First then regarding the Duránis, the chief of the Afghán clans. The origin of this tribe is apparently unknown, but it seems to be generally believed that it emigrated from the mountains of Ghór. According to the TAZKIRA'T-UL-MULU'K above quoted, the Duráni descent is as follows:



The old name of the Duránis was Abdáli, till Ahmad Sháh, an Abdáli of the Sadozai family or subsection of the Pópalzai section of Abdális, the hero of Pánipat, in 1747 took the title of DURR-I-DURRA'N, the Pearl of Pearls, and named his tribe after himself Duránis. The two great divisions of the Duránis are ZI'RAK and PANJPA'O, and of these the most honorable by descent are the ZI'RAKS. The ZI'RAKS are usually divided into 4 sections (1)

* Those marked with an asterisk with the addition of Zai are the names of present Durání sections or subsections.

Pópalzai, (2) Alako'zai, (3) Ba'rakzai, (4) Achakzai and the Panjpa'os into 5 sections, thus, (5) Nu'rzai, (6) Ali'zai, (7) Isha'kzai, (8) Khu'gia'ni, (9) Ma'ku'.* Along our present route, however, only the Achakzais were found in any numbers, but a few of the Pópalzais and Bárakzais were also found in the Pishin. As far as I know there is but one Pópalzai village and one Bárakzai village in Pishin, but there are a good many Bárakzais scattered about the valley formerly concerned with the late government there. The Pópalzais of the valley are of the Sadozai subsection †

The Ba'rakzais met with in the Pishin are all Muhammadzais,‡ connected in some way with the late government of the valley. Sirdár Khu'shdil Kha'n of the royal house seems to have been Governor of the

* There is also a low class of Duránis called Ságzai found in the Arghisán valley.

† The Sadozais were the old ruling family of the Pópalzais and under Asad-ullah (of the Tribe Abdáli, see. Pópalzai, subsec. Sadozai) threw off the yoke of the Persian at Herát in 1716, soon after Mír Vais, the Ghilzai, began to assert the independence of the Afghán nation. On the assassination of Nádir Sháh in 1747, Ahmad Khán, a Sadozai (afterwards Ahmad Sháh Duráni) gradually conquered for himself all Afghánistán and most of the Panjáb, and at his death in 1773 he was ruling from the Sutlaj to the Oxus and from the Himalayas to Khorásán. Till 1793 Taimu'r Sha'h his son reigned, but at his death his kingdom was fought for among his children in the way so common in oriental history, mainly resulting in the loss of the Panjáb to the Sikhs. The brothers who were ruling at the time of Taimu'r Sha'h's death were

Zama'n Sha'h in Kábul.
Hama'un Sha'h in Kandahár.
Mahmu'd Sha'h in Herát.
Abba's Mírza' in Peshawur.
Ko'handil Mírza' in Kashmír.

Of these Zamán Sháh and Mahmúd Sháh obtained the throne of Afghánistán with the usual bloodshed, and after them another brother, the famous Sháh Shújah-ul-Mulk, about 1809. Mahmúd Sháh, however, ousted him and again ruled till 1818, when he was deposed by the Ba'rakzai brothers, sons of Painda Khán, his Wazír, and son of Háji Jamál Khán (a Muhammadzai Bárakzai), the Sirdár who had helped Ahmad Sháh in the early days of his sovereignty. Since that date the Mohammadzai Bárakzais have fought among themselves for the throne resulting in the victory and sovereignty successively of the Amirs Dost Mohammad Khán, Shér Ali Khán and YaSúb Khán the late ruler. In 1839 the first Afghán war, the history of which is of course still fresh in our memories, was undertaken to restore Sháh Shújah-ul-mulk, the Sadozai, to his throne at Kábul. The Sadozais are still highly respected, and the Pópalzais from which they sprung are the most honoured among Afghán Tribes. During the greater part of the Sadozai ascendancy, the ministers were chosen from the Bámi'zai subsection of the Pópalzais. The chief other subsections of the Pópalzais as far as I could ascertain are (3) Marsingzais, (4) Kha'nzais, (5) Aiyúbzais, (6) Madozais, (7) No'azais.

‡ The other subsection of the Bárakzais as far as I could ascertain were (2) Achalzais, (3) Sulimánzais, (4) Khunsei'zais, (5) Baianzais.

Pishin under Shér Alí, but never to have lived there, and I was quite surprised to find how little appeared to be known about him locally. His fort, called Khúshdil Khán, is in the north-east corner of the Pishin, and from it his Naib or Lieutenant Nu'r Muhammad Kha'n (Muhammadzai Bárakzai) seems to have ruled and collected the revenues. This last fled at our advance into the Pishin in 1878, and the valley was handed over for government under Sir R. Sandeman, agent for Beluchistán, with the fort Khúshdil Khán, to another Nu'r Muhammad Kha'n, Luga'rí', a Belóch in our service as Názim or ruler.* This Khúshdil Khán's descent was given me locally, thus:

HA'JÍ JAMA'L KHA'N (temp. Ahmad Sháh Duráni.)
|
Sirda'r Paind Kha'n (Muhammadzai Bárakzai)
|

Mihardil Kha'n.	Pu'rdil Kha'n.	Dost Muhammad Kha'n, Amír of Kábul.
Khu'shdil Kha'n. Governor of Pishin, 1878.	Mi'r Afzu'l Kha'n. Governor of Kandahar, 1878.	Sher Alí' Kha'n, Amír of Kábul.
		Yaḳu'b Kha'n, Amír of Kábul.†

* Another and perhaps the most true local story is that Khúshdil Khán died about 7 years ago, say 1872, and in former days Abd-ul-Karím Khán (Muhammadzai, Bárakzai) was his Naib, but on Shér 'Alí's final accession in 1869, Khúshdil Khán lost his government and went to reside in Kandahár, while Nu'r Muhammad Kha'n (Muhammadzai Bárakzai) was sent to govern the Pishin direct from Sher 'Alí himself.

† Paind Khán's sons by 5 mothers were—

1. Fateh Kha'n Wazir of Mahmúd Sháh,
   Muhammad Azim Kha'n,
   Taimu'r Kha'n.
2. Pu'rdil Kha'n, Governor of Kandahár,
   Sherdil Kha'n, Governor of Kandahár,
   Kohandil Kha'n, Governor of Kandahár,
   Rahimdil Kha'n,
   Mihardil Kha'n.
3. Do'st Muhammad Kha'n, Amir of Kábul,
   Ami'r Muhammad Khán,
   Jamál Khán.
4. Sultán Muhammad Khán,
   Yár Muhammad Khán,
   Pír Muhammad Khán,
   Sayad Muhammad Khán.
5. Nawáb Asad Khán,
   Nawáb Sama't Kha'n,
   Nawáb Jabar Khán.

The Achakzai section of the Durânis is the tribe inhabiting the mountains known as the Khoja Amra'n Range, the Toba Plateau, and the Pishin and Kadanei valleys in part. They are said to have been divided off from the Bárakzais by Ahmad Sháh, as that tribe was getting too powerful, and I have met Paṭháns about Kandahár, who classed the Achakzai as a Bárakzai subdivision. The Achakzais are divided into Baha'durzais and Gajanzais.

BAHA'DURZAIS.

Ghabfzais.	Shamuzais.	Ba'karzais.
Ka'kozais.	Fa'mzais.	Ishda'nizais.

GAJANZAIS.

Ahmadzais.	Hamzais.	Alozais.
Ashezais.	Malikzais.	Julizais.
Bu'rhanzais.	La'lizais.	Mushkizais.
Shamakzais.	Ma'pizais.	Ba'dazais.
Ma'lizais.	Hu'senzais.	Shakarzais.
Ka'milzais.	Sulima'nzais.	Usma'nzais.
Á'dazais.	Abdullazais.	
Adrakzais.	Ba'zamzais.	

I, however, came across two subsections of Achakzais not here mentioned called Habi'bzais* and Abdals in the Pishin. This name Abdal may perhaps only be the title of the malik or chief as the present Sirdár Mi'r Aslam Kha'n of the Achakzais is locally called Mír Aslam Khán Abdal or Abdáli, as also is Madat Kha'n, the head of an Achakzai village in the Pishin, called after him. All the inhabitants of the last village, however, are called Abdals.

The next clan we have to deal with are the Taríns. These are the second of the Afghán Tribes in point of importance and national estimation. Their legendary descent from Kais is clearly made out. Saraban, Kais's eldest son, had five sons of whom the second was Tarín. Tarín had three sons, Tór Tarín, Spín Tarín and Abdal, and from the two eldest are descended the modern Tarín Tribe. According to a legend Tarín's dark son was called Spín Tarín or Fair Tarín, and his fair son Tór Tarín or Dark Tarín. The Tór Taríns inhabit the Pishin valley and the Spín Taríns the country about Tal and Chotiáli. Lumsden subdivides this clan as follows:

* Lumsden, however, makes out the Habi'bzais to be Tór Taríns, but as far as I could ascertain, they are Achakzais.

TOR TARÍNS.

Batazais.	Álízais.	Habíbzais.
Haikalzais.	Núrzais.	Hamránzais.
Málizais.	Kulázais.	Karbelas.
Kadazais.	Músizais.	Sázais.
Khánizais.	Abdurrahmánzais.	
Khámzais.		

SPÍN TARÍNS.

Shádízais.	Lasránis.	Adwánis.
Marpánis.		

This list agrees with that given me *en route* as far as the Spín Taríns are concerned, but as regards the Tór Taríns mine differs considerably. First I would remark that the Habíbzais are, as far as I could make out, Achakzais and not Taríns at all. Next as regards the Karbélas, who have been hitherto put down as Taríns somehow connected with the Pishin Sayads, I have ascertained the following particulars. The Karbélas inhabit a village of the same name near Sayad Paind in the Pishin and call themselves Sayads. They are, however, disowned by the Sayads and also by the Taríns, Kákars and Duránis. The local legend regarding their origin is this. In days gone by, a little child by name Karbéla, was travelling through the Pishin in a kátila. He lost his party and was seen running along the road, crying, by a kind-hearted Sayad who took him in and nourished him, but declined to admit him into his family or sect. On growing up, he married a Tarín woman, and from him there sprang by Tarín intermarriages the present race of Karbélas, now said to be 600 strong in men. This is the Sayad version of the story, the Tarín legend is the same except as regarding intermarriages with themselves. They say the mother of the original Karbélas came from no one knows where and disown the whole race. The probabilities are, they sprung from Paṭháns who had to take refuge in the Pishin from some other distant place. The Khánizais are divided into Lúr Khánizais and Dab Khánizais according to my information. In the list of Tór Taríns which I collected, the following do not appear in Lumsden.*

Málikyárs	Manzakais	Kamálzais.
Máezais	Háru'ns.	

While his list contains the following which are not found in mine.

Kádazais	Náozais	Hamránzais.
Khámzais	Abdurrahmánzais	

* There are a few trifling variations in some names regarding which see below on Language.

The probabilities are that a combined list would reach nearest the true statement of their subsections.*

Like the Tarins, after whom they rank, *i. e.*, third on the list of clans, the Kákars claim direct descent from KAIS. Firstly, Kais's third son was GURGHUSHT who had three sons DÁNÍ, BÁNÍ and MANDÍ. Of these DÁNÍ had four sons, KÁKAR, NÁGHAR, DÁDÍ and PÁNÍ.† Secondly SHÍRÁNÍ the eldest son of SHARÍF-UD-DI'N, eldest son of SARABAN Kais's eldest son, on account of family squabbles joined the Kákars and called himself a GURGHUSHTAI. Such is the common legend. The Kákars themselves vary it thus. Kais went to Mecca and there obtained the name of PRET KHÁN (elsewhere PIHTÁN). His eldest son SHARÍF-UD-DIN or SARABÁN had five sons SHÍRÁNÍ, TARÍN, MYUNÍ, BARECHÍ‡ and UMAR-UD-DÍN. The mother of SHÍRÁNÍ, who was a Kákar, finding that her husband intended making TARÍN, his second son, his heir, left his protection and returned to her own tribe. Her descendants have therefore been included among Paṭháns and with them the whole of the Kákars under one name. This subverts the other legends which make the Kákars claim descent through GURGHUSHT from KAIS.

The following clans claim relationship with or descent from the Kákars. The GÁKARS of Kashmír along the Jhílam, the TAIMUNIS (EIMAKS) of GHOR, the FIROZKOHÍ HAZÁRAS (EIMAKS) of HERÁT, the KAYANIS of SEISTÁN,§ and lastly the KÁKARS and GHILZAIS also consider themselves nearly related in blood. Taking into consideration the unquestionably mixed blood of the Ghilzais and their legendary relationship with the Kákars, as also that of such pure EIMAKS as the HAZÁRAS and TAIMUNÍS,‖ the Kákar descent from Kais would seem to be doubtful.

* Among the tribes of Tarín descent are said to be the ZAIMUKHTS.

† This would make the PA'NI'ZAIS separate from the Kákars, but they seem to be considered a section of them at the present day.

‡ Whence the BARE'CHI' Paṭháns of SHORA'WAK.

§ Usually called Belóchis, but really descendants of SANDAR KHE'L Kákars.

‖ A pure EIMAK is perhaps, however, a misnomer. The origin of the race being quite obscure. By features they are TA'TARS and by language Persians. They are divided into TAIMU'NI's, HAZA'RAS, TAIMU'RI's and ZU'RI's. It may help towards the solution of the Eimak origin to quote the following from Yule's Marco Polo, I, 94. "Contemporaneously with the KARAUNAHS (or KARA'WINAHS the celebrated robbers of mediæval Persia) we have frequent mention of predatory bands known as NIGU'DARIS who seem to be distinguished from the KARAUNAHS, but had a like character for truculence. Their head-quarters were about SIJISTA'N, and Quatremère seems disposed to look upon them as a tribe indigenous in that quarter. Hammer says they were originally the troops of Prince NIGU'DAR, grandson of CHAGATAI (CHAGATAI was the ruler and curse of Turkistán and a son of CHINGIZ and therefore brother to OKKODAI and uncle to MANGKU, KUBLAI and HULA'KU), and that they were a rabble of sorts, Mongols, Turkmáns, Kurds, Shúls and what not. We hear of their revolts and disorders down to

The Kákar Territory extends from the Pishín valley to the Borai valley and from the Zhób valley to Quetta, the line of the Bolán Pass and the Marri (Belóch) country. They are divided into two main divisions, the Great Kákars (Lowe' Kákar) and the Lesser Kákars (Kuchnai Kákar). As regards the Great Kákars, the present writer had but little opportunity of learning much. They occupy the Zhób valley and apparently are divided into—

Khwaidádzais,	Aktarzais,	Mehtarzais,
Mursiángzais,	Awazais,	Sargarais.

And probably also the Jalagais, Mu'sa Khel and Karízais belong to this division.

The Lesser Kákars are divided into Sulimán Khels; Amand Khels; Mehtarzais; Pánízais; Bázais; Shamozais; Surgarais; Malagais; Isá khels; Sara'ngzais, of which Mulázais and Táráns are subsections; Zakhpels, subdivided into Amakais, Kanozais and Náozais; Dumars; Utmán Khels; and Sandar Khels, whose known subdivisions are Alízais, Shabozais, Mu'rs, Dargais, Wahárs and Tenizais.* The Kákars about Khunchagai near Mt. Kand, variously called the Sanatía and Simantha Kákars, are I believe the Amand Khel above mentioned. They were formerly, under the name of Targhánís, under Háji Khán of infamous memory during the war of 1839, and his son Kámil Khán is now chief of the Amand Khel.

The next clan met with *en route* was the Lu'ni (properly Lonai) Khel, about whom very little is known. They are generally supposed to be Kákars by descent, but I should say from what I heard from the Lu'nis themselves and from the Kákars, this is not the case. They call themselves of Duráni descent, a claim which is allowed by their neighbours. The Hamzazais are the only known subdivision of this Tribe, but there are

1319, up to which date Mirkhond says that there had been 21 fights with them in 4 years. Again we hear of them in 1336 about Herát, whilst in Báber's time they turn up as Nukdaris fairly established as tribes in the mountainous tracts of Karnu'd and Ghor to the west of Kábul, and coupled with the Hazáras who still survive both in name and character. Among them, says Báber, are some who speak the Mongol languages. The Hazáras are eminently Mongol in feature to this day, and it is very probably that they or some part of them are descendants of the Karaunahs or Nigu'daris or of both, and that the origination of the bands so called from the scum of the Mongol inundation is thus in a degree confirmed. It is worthy of notice that Ab-ul-Fazl who mentions the Nukdaris among the nomad tribes of Kábul says, the Hazáras are the remains of the Chagataian army which Mangku Kha'n sent to the aid of Hula'ku under the command of Nigu'dar Oghza'n.

* The Esóts of the De'raja't are sometimes called Kákars but this is doubtful. Ka'si' Ka'kars are said to inhabit the Sha'l Valley (Quetta), but I did not see any there.

doubtless more, and I think it would be safe to include SARÁGIS amongst them. They inhabit a largish extent of country, for the most part considerably deserted, and used merely as grazing-ground. Their villages are mostly found in what is called the LU'NI Valley to the south of the Bórai, *i. e.*, between it and the Tal Valley. All the country from the Bórai Valley east of the Tal Valley as far as the Belóch Border and the MU'SA KHEL country belongs to them, except the small portion occupied by the ZARKHA'NS near Chótiáli.

Of the ZARKHA'NS nothing more is known except that they are Paṭháns and not of Kákar, Tarín or Lúni extraction. They are to be found about the mountains to the east and south of Chótiáli, in the HANOKAI Pass and BA'LA' DHA'KA'. The MARRIS have nearly wiped them out as a race by continual raids. In Leech's time* there were three villages belonging to them near Chótiáli, *viz.*, DOST MUHAMMAD, FAZL KHAN and ÁLÍ KHAN, but I do not know if they still exist.

Perhaps the origin of the Lúnis and Zarkháns and even of some of the Kákars, especially the Sandar Khél, should be sought with that of the neighbouring Belóch Tribes, if one could only ascertain what that is. Indeed the KAYANIS of SEISTAN usually called Belóchis, are Sandar Khél Kákars, and there is nothing repugnant in the history of the Belóch Tribes to the idea of some of them being of the same descent as their deadly enemies the Paṭháns. For the KAIHÍRIS about CHATTAR and PULEJI in KACHI, now acknowledged to belong to the Belóch Tribes, are of unquestioned Paṭhán descent.† And, although the presence of many Belóchi words in their dialects may be the result of propinquity, the similarity of face and figure of the LU'NIS, SANDAR KHELS and ZARKHA'NS to the neighbouring Belóch Tribes of BA'RKHO'M is quite remarkable, and they might well have a common origin with them, especially as the Belóchis can hardly be called a nation, being rather an agglomerate of heterogeneous tribes. Thus the BRAHO'IS are probably aboriginal, the GURCHA'NIS a Sindian Tribe, the RINDS and LU'MRIS probably of Hindú (Rájpút) origin and the GA'DURS of LÁS of Arab descent, while the tribes of MAKRA'N are Arabs, Sikhs, Sindhís, Persians, Jats and what not.‡

* Major Leech's journeys were made about 1839.

† Hughes's Beluchistán.

‡ In connection with the probable Turkmán or Mongol origin of the bulk of the Belóch Tribes, the words TUMAN and TUMANDA'R are interesting. TUMAN or TOMAN was a Mongol division of the army, *viz.*, 10,000, and hence in the Mongol dominions it came to mean 10,000 generally. WASSA'F describing KINSAY (KINGSSE' or HANGCHAU) states it had "70 TOMANS of soldiers and 70 TOMANS of RAYATS." Marco Polo states its revenue in TOMANS of gold and Friar Odoric in TOMANS of BALISH (paper money). TMAN or TMA is still used in Russia for 10,000. In Beluchistán TUMAN means a camp and TUMANDA'R the commander of a camp and thence the chief of a tribe, but whether

While discussing the Paṭhán Tribes something should be remarked about the SAYADS found in every part of Afghánistán* and in some numbers in the Pishin where they own several villages. Wherever they may happen to be, they are a sect apart from the surrounding inhabitants, are always respected and seem to be more intelligent than the Paṭháns in general. They are not considered Paṭháns and claim to be of Arab descent as their name implies. This claim, however, is I think of a slender description among the Sayads in the Pishin with whom we have now to do. Their sympathies are all Afghán, they are subdivided in a suspiciously similar manner, and the story of their descent confirms the suspicions as to their separate origin from the Paṭháns about them. The story is that HA'RU'N, fifth in descent from Kais, had a daughter who married an Arab Sayad who visited him, and from her are said to be descended all the Pishin Sayads, notably the SHA'DIZAIS and HAIDARZAIS.† The present subdivision of the Pishin Sayads appear to be—

GANGALZAIS.	SHA'DÍZAIS.	YA'SINGZAIS.
BAGARZAIS.	BRAHAMZAIS.	URUMZAIS.
AJABZAIS.	HAIDARZAIS.‡	

The following table shows the subdivisions of the tribes above discussed as far as known.

No.	Tribe.	No.	Division.	No	Section.	Subdivision.	No.	Subsection.
I.	DURA'NI or ABDA'LI.	1	ZÍRAK.	1	POPALZAI.		1	SADOZAI.
							2	BA'ME'ZAI.
							3	MARSINGZAI.
							4	KHA'NZAI.
							5	AIYU'BZAI.
							6	MADOZAI.
							7	NOAZAI.
				2	ALAKO'ZAI.		1	JALUZAI.
							2	MELAZAI.
							3	SARKA'NI.
							4	SANDARZAI.
							5	KA'REZAI.
							6	NAUSAZAI.

this is due to the passage of the Mongols through their country on towards Hindustán or to their Central Asian origin does not appear. Yule's Marco Pole, I, 94, 281 and II, 169, 171.—Hughes's Beluchistán.

* I saw one village of them in BA'RKHO'M among the Independent Belo'ch Tribes.

† According to one legend, the KARR'ELAS are descended from a waif picked up by this HA'RU'N. See above.

‡ Among the Pishin Sayads faces of a SI'DI' type are not uncommon, and I saw one woman with purely African features near A'LI'ZAI. This may result, however, from their wandering habits and be no indication of descent.

No. Tribe.	No. Division.	No. Section.	Subdivision.	No. Subsection.
I. Dura'ni or Abda'li.	1 Zirak.	3 Ba'rakzai.		1 Muhammadzai.
				2 Achalzai.
				3 Sulima'nzai.
				4 Khu'nsezai.
				5 Baianzai.
		4 Achakzai.	Baha'durzai.	1 Gha'bezai.
				2 Ka'kozai.
				3 Shamuzai.
				4 Fa'mzai.
				5 Ba'karzai.
				6 Ishdanizai.
				7 Abdal.
			Gajanzai.	8 Ahmadzai.
				9 Ashezai.
				10 Burhamzai.
				11 Shamakzai.
				12 Ma'lizai.
				13 Ka'milzai.
				14 Adazai.
				15 Adrakzai.
				16 Ha'zuzai.
				17 Ma'likzai.
				18 La'lizai.
				19 Ma'pizai.
				20 Husenzai.
				21 Sulima'nzai.
				22 Ab'dulazai.
				23 Ba'zamzai.
				24 Alozai.
				25 Tulizai.
				26 Mushkizai.
				27 Ba'dizai.
				28 Shakarzai.
				29 Usma'nzai.
				30 Habi'bzai.
I. Dura'ni or Abda'li.	2 Panjpa'o.	5 Nu'rzai.		1 Cha'lakzai.
				2 Ba'dizai.
		6 A'lizai.		1 Hassanzai.
				2 Alakzai.
				3 Gwarazai.
		7 Isha'kzai.		1 Hawazai.
				2 Terozai.
				3 Mandarzai.
				4 I'dzai.

No. Tribe.	No. Division.	No. Section.	Subdivision.	No. Subsection.
I. Dura'ni or Abda'li.	2 Panjpa'o.	8 Khu'gia'ni.	Sirki Wazi'ri.	1 Ra'ni Khel.
				2 Nani.
				3 Aga'm.
			Motik Wazi'ri.	4 Pi'ra Khel.
				5 Ahmad.
				6 Khozeh.
			Khairbu'n.	7 Naji'bi.
				8 Kharai.
			Sherzah.	9 Panjpai.
				10 Dopai.
				11 Khidar Khel.
		9 Ma'ku.		
		10 Sa'gzai.		
II. Tari'n.	1 Tor Tari'n.	1 Batazai or Badozai.		
		2 Kha'nizai.		1 Lu'r Kha'nizai.
				2 Dab Kha'nizai.
		3 A'li'zai.		
		4 Nu'rzai.		
		5 Kula'zai.		
		6 Mu'sizai.		
		7 Segai.		
		8 Ma'likya'r.		
		9 Maezai.		
		10 Haikalzai.		
		11 Manzakai.		
		12 Ma'likai.		
		13 Ha'ru'n.		
		14 Kama'lzai.		
		15 Kadazai.		
		16 Kha'mezai.		
		17 Naozai.		
		18 Abdurrahma'nzai.		
		19 Hamra'nzai		
II. Tarín.	2 Spi'n Tari'n.	20 Sha'dizai.		
		21 Marpa'ni.		
		22 Lasra'ni.		
		23 Adwa'ni.		

No. Tribe.	No. Division.	No. Section.	Subdivision.	No. Subsection.
III. Ka'kar.	1 Lowe' Ka'kar	1 Khwaida'd-zai.		
		2 Mursia'ngzai.		
		3 Aktarzai.		
		4 Awazai.		
		5 Mehtarzai.		
		6 Surgarai.		
		7 Jalagai.		
		8 Mu'sa Khel		
		9 Kabi'zai.		
		10 Ba'rakzai.		
	2 Kuchnai Ka'kar.	11 Sulima'n Khel.		1 Tragarai.
		12 Amand Khel or Siman-tha or Sanati'a.		
		13 Mehtarzai.		
		14 Pa'nizai.		1 Adizai.
		15 Ba'zai.		
		16 Shamozai.		
		17 Surgarai.		
		18 Malagai.		
		19 I'sa' Khel.		
		20 Sara'ngzai.		1 Mula'zai.
				2 Ta'ra'n.
		21 Zakhpe'l.		1 Amakai.
				2 Kanozai.
				3 Naozai.
		22 Dumar.		
		23 Utma'n Khel.		
		24 Sandar Khel.		1 A'li'zai.
				2 Shabozai.
				3 Múr.
				4 Dargai.
				5 Waha'r.
				6 Tenizai.
				7 Kayani.
IV. Lu'ni Khel.	1 Hamzazai.			
	2 Sara'gi.			
V. Zarkha'n.				

Tribes of doubtful Afghán descent.

I. Sayad.	1	Gangalzai.
	2	Bagarzai.
	3	Ajabzai.
	4	Sha'dizai.
	5	Brahamzai.
	6	Haidarzai.
	7	Ya'singzai.
	8	Urumzai.
II. Karbela.		

(To be continued).

On the Súryaprajñapti.—*By* Dr. G. Thibaut, *Principal, Benares College.*

Part I.

Until recent times our knowledge of the cosmological and astronomical system of the Jainas was very limited and founded not on an independent investigation of the original Jaina literature, but only on the occasional references made to Jaina doctrines by the orthodox Hindu writers on astronomy. For a long time the short account of the subject given by Colebrooke in his "Observations on the sect of the Jainas" (Asiatic Researches, 1807; Essays, Vol. II), remained the only one, and although accurate as far as it goes, it is very insufficient since it chiefly refers to the one doctrine of the Jainas only, which has at all times struck outsiders as peculiarly strange and absurd, *viz.*, the assertion that there exist two suns, two moons and a double set of constellations. This is indeed the doctrine by which the system of the Jainas could most easily be distinguished from similar old Indian systems, and it is consequently referred to and controverted with preference in the Siddhántas. The best known passage from the latter is the one quoted by Colebrooke from Bháskara's Siddhánta-Siromaṇi. "The naked sectaries and the rest affirm that two suns, two moons and two sets of stars appear alternately; against them I allege this reasoning. How absurd is the notion which you have formed of duplicate suns, moons and stars, when you see the revolution of the polar fish."

This passage of Bháskara's is manifestly founded on a passage found in Brahmagupta's Sphuṭa-Siddhánta where we read in the so-called Dúshaṇádhyáya:

भानि चतुः पञ्चशत द्वै द्वावर्कौ द्वौ जिनोक्तं यत्।
ध्रुवमत्स्यावर्त्ता भवति यतोऽज्ञा तत्तदसत्॥

o

"There are fifty-four nakshatras, two risings of the sun; this which has been taught by Jina is untrue, since the revolution of the polar fish takes place within one day."

And a passage to the same effect occurs in the 13th adhyáya of Varáha Mihira's Pañchasiddhántiká.

In 1868 Professor A. Weber, to whom we are indebted for our first acquaintance with so many works of Indian literature, published in the tenth volume of the "Indische Studien" a paper on the Súryaprajñapti, being apparently the most important astronomical book whose authority the Jainas acknowledge, and it then appeared that the doctrine of the existence of two suns, moons, etc. constitutes only one feature of a comprehensive system which on the whole is much less fantastical than might have been expected and which, fantastical or not, shows intimate relations to the astronomical and cosmological views which appear to have prevailed all over India before Greek science began to influence the East. Especially it appeared—as pointed out by Professor Weber—that the doctrine propounded in the Súryaprajñapti shows in many points an unmistakable resemblance with that contained in the Jyotisha-Vedáñga the presumably oldest specimen of Indian astronomical literature, and it thus became manifest that the astronomical books of the Jainas do not only furnish information about the opinions held by a limited religious sect, but may, if rightly interrogated, yield valuable material for the general history of Indian ideas. The writer of the present paper has therefore thought it worth while to submit the Súryaprajñapti to a renewed detailed investigation, whereby we should be enabled rightly to esteem its position in the astronomical literature of India, clearly to conceive the peculiar features distinguishing the astronomical system of the Jainas from other systems, and on the other hand to point out what the Jaina system has in common with other systems, and in what way therefore it may be employed for the elucidation of the latter. Professor Weber's paper gives in the main only a short summary of the contents of each chapter of the Súryaprajñapti, following the order of the chapters as found in the work itself and omitting none of them. This was of course the right plan to adopt in a paper giving the first account of a hitherto unknown book. In the present paper it has on the other hand been preferred to give a connected account of the chief doctrines only which are found in the Súryaprajñapti, to combine hints found in the various parts of the work wherever this appeared necessary for the sake of greater clearness, and again altogether to omit relatively unimportant matter. It must be stated at the outset that this paper—like that of Professor Weber—is based more on Malayagiri's commentary on the Súryaprajñapti than on the text of the latter work itself; which apparently anomalous proceeding finds its explanation in the fact of the Manuscripts

of the Súryaprajñapti, commonly met with, containing the commentary only *in extenso*, while as a rule only the first words of the passages commented on are given. As it, however, appears that the commentary faithfully follows the text, and as on the other hand the latter, devoid of a commentary, would be hardly intelligible, the absence of a complete text of the Súryaprajñapti is less inconvenient that might at first be assumed. At any rate we may obtain at present a sufficiently full and accurate knowledge of the contents of the book; and in works of the class to which it belongs the interest attaching to the form is a comparatively small one. As already stated, the present paper is by no means intended as an exhaustive review of the contents of the Súryaprajñapti; it is rather meant as an introduction to a complete edition of the work itself which, on account of the various old materials it contains, well deserves to be published *in extenso*. And an introduction of this kind could not well be missed, even if we possessed a complete edition or translation of the book, as the reader of the text of the work or of a literal translation of the text would find it by no means an easy task unaided to reconstruc the leading features of the system.

The Súryaprajñapti is written in Jaina-prákṛit, and divided into twenty books called prábhṛitas, some of these again into chapters, called prábhṛita-prábhṛitas. The arrangement of the matter treated of is by no means systematical, and the text, still more the commentary are full of tedious reiterations. Malayagiri, the commentator, has done his work most conscientiously; too conscientiously, the reader afflicted by his extraordinary diffuseness often feels tempted to say. Especially he delights in illustrating the numerical rules given in the text by at least half a dozen examples, where one would have sufficed, dwelling with evident complacency on each step even of the simplest calculation. But his comments are very perspicuous and certainly deserve to be extracted, although not to be reproduced *in extenso*.

Proceeding now to our proposed task, let us dispose at the outset of the distinctive doctrine of the Jainas according to which there are two different suns, two moons and two sets of constellations. When inquiring into the origin of this certainly peculiar notion, we are led to a very simple reason, an impartial consideration of which makes the Jaina system appear much less fantastical and arbitrary than we at first are inclined to think. This reason has already been pointed out by Colebrooke, Asiatic Researches, Vol. IX, p. 321, where he says "They (the Jainas) conceive the setting and rising of stars and planets to be caused by the Mountain Sumeru and suppose three times the period of a planet's appearance to be requisite for it to pass round Sumeru and return to the place where it emerges. Accordingly they allot two suns, as many moons, and an equal number of each planet, star and constellation to Jambudvípa; and imagine that these appear on alter-

nate days south and north of Meru." These words scarcely require anything added to be to them in the way of comment. The Jainas hold (as will be seen in detail further on) the old Indian idea of sun, moon and stars revolving round Mount Meru. To anybody holding this opinion, the question must have suggested itself "In what time is one such complete revolution performed?" The prevailing opinion, represented for instance by the Puráṇas, was that the whole revolution is performed in twenty-four hours, so that the sun describes during the time when it is day in Bharatavarsha the southern half of his circle, and during the time when it is night to the south of Mount Meru, and day in the countries north of it, the northern half. The Jainas, however, took a different view of the matter. To them it seems to have appeared more appropriate that as there are four directions—south, west, north and east—the sun's circle should be divided into four quarters corresponding to the four directions, and that he should bring day in succession to the countries to the south, west, north and east of Meru But then, as it must be supposed that his passing through each of the four quarters occupies the same time, how can it come about that he again appears to rise to the Bharatavarsha after the lapse of a period only sufficient to advance his place by one quarter of the circle? Out of this difficulty the Jainas extricated themselves by simply assuming that the sun rising on a certain morning is not the same sun which had set on the preceding evening, but a second sun similar in every way to the first one. The whole circle is thus described by two suns separated from each other by half the circumference, each of which appears in the Bharatavarsha on alternate days. The same reasoning lead to the assumption of two moons and two sets of stars.

Great as appears to be the difference produced by this hypothesis between the system of the Jainas and the commonly received opinions, it practically is of very small importance and may—as will be done in the following—as a rule be left altogether out of account whenever we have to consider the motions of sun and moon. When for instance the sun having started from Aśviní has passed through the twenty-eight nakshatras, he enters, according to the generally received opinion, again into the same nakshatra Aśviní, according to the Jaina opinion into a second nakshatra called Aśviní too; but as this second nakshatra has the same name, the same extent, and the same relative position as its namesake, as like the latter it is preceded by Revatí and followed by Bharaṇí, and as at the same time when the sun has entered into the second Aśviní, another sun the exact and indistinguishable counterpart of the former one has entered into the former Aśviní, it is clear that we may, when speaking of the motion of the heavenly bodies, save ourselves the trouble of continually referring to two suns, two moons and two sets of nakshatras and, remembering

that there are two of each kind, express ourselves as if there were only one. To proceed.

The astronomic-chronological period on which the system of the Súryaprajñapti is based, is the well-known quinquennial yuga or cycle with which we have long been acquainted from the Jyotisha Vedáñga. The same cycle is described in the Garga Saṁhitá as we see from the extant fragments of the latter work, and we learn from Varáha Mihira's Pañchasiddhántiká that it likewise formed the fundamental doctrine of a Paitámaha Siddhánta which, according to Varáha Mihira's judgment, was one of the more important Siddhántas known at his time. It is alluded to and rejected in a few words by Brahmagupta in the dúshaṇádhyáya of the Sphuṭa Brahma-siddhánta. References to this cycle are met with in the early history of Buddhism. Whether the so-called Vedic literature is acquainted with a cycle of this nature is doubtful.* It will not be necessary to dwell in this place at length on the constitution of the yuga; it will suffice to state that it is based on the assumption of five sidereal revolutions of the sun being exactly equal in duration to sixty-seven periodical revolutions of the moon and to sixty-two synodical months, while one complete revolution of the sun is supposed to be performed in three hundred and sixty-six days. That a cycle of this nature based as it is on an utterly wrong assumption could maintain itself for a considerable time as it manifestly has done is a matter for legitimate wonder, and does not find a parallel in the history of chronological systems among any other civilized nation. At the end of one yuga already the quantity of the error induced by the mistaken estimation of the length of the solar year amounts to nearly $5 \times \frac{3}{4} = 3\frac{3}{4}$ days, the accumulation of which quantity after the lapse of a few yugas could not escape the attention, we should think, of even the most careless observers. The matter would indeed lie altogether differently if a conjecture (or as it stands we might almost say, an assertion) of Colebrooke referring to this point had been verified. He—after having given an account of the manner in which the Jyotisha-Vedánga manages to maintain harmony between civil and lunar time—continues "and thus the cycle of five years consists of 1860 lunar days or 1830 nycthemera, subject to a further correction, for the excess of nearly four days above the true sidereal year: but the exact quantity of this correction and the method of making it, according to this calendar, have not yet been sufficiently investigated to be here stated." The fact is that of this correction which Colebrooke considered so indispensable, that he speaks of it as being actually found in the Vedánga, no

* The question referred to in the text cannot be discussed here. The writer hopes shortly to find an occasion fully to treat it elsewhere.

traces are to be found either in the Vedánga itself or—and this is of great importance as the Vedánga is still partially unexplained—in the Súryaprajñapti which illustrates the constitution of the quinquennial yuga in the most diffuse manner, but has nothing to say about a correction of the kind mentioned.—The subdivisions of the yuga are in the Súryaprajñapti described with great fulness; what is really essential admits, however, of being stated in a few words. Each solar year is divided into two ayanas of one hundred and eighty-three days each. Each ayana in its turn comprises six solar months, each of which lasts 30½ days. Two of these solar months constitute a solar season; the reckoning of the seasons starts, however, not from the beginning of the yuga, but the latter is made to mark the middle of a season, so that the rainy season which counts as the first begins a month before the beginning of the yuga. Again the yuga comprises five years of 360 days each, each year in its turn being divided into twelve months of 30 days each; in the Súryaprajñapti this kind of year—commonly known as the sávana year—is called the *karma-year* or *ritu-year* which latter name would more properly be given to the solar year. The six days by which this year is shorter than the solar year are called atirátras. Again the yuga comprises sixty-two synodical months, the first of whom begins with the moon being full in the first point of Abhijit. Each of these months is divided into a light and a dark half; each half comprises fifteen tithis or lunar days of equal duration. Sixty-two of these months being equal in duration to sixty-one karma-months of 30 days each, it follows that sixty-two tithis are equal to sixty-one natural days; in order therefore to maintain harmony between the numbers of the natural days and those of the tithis, a break in the counting of the tithis is made whenever two tithis terminate during one natural day, *i. e.*, according to the Súryaprajñapti on the occurrence of each sixty-second tithi. The details of this process are not stated in the Súryaprajñapti, but there can be no doubt that *mutatis mutandis* it was managed as it has been managed in India ever since. To give an example, the sixtieth natural day, counting from the beginning of the yuga, during which the sixtieth tithi terminated was counted as pañchadaśí (fifteenth tithi), the next following day as pratipad (first day of the new lunar half month) and then the day after that not as dvitíyá, second lunar day, but as tritíyá third lunar day, the second lunar day having already terminated together with the preceding sixty-first natural day. These sixty-two lunar months are divided among five lunar years, the first, second and fourth of which comprise twelve lunations each, while the third and fifth count thirteen each. The technical name of years of the latter kind is abhivardhita-samvatsara, the increased year. The method according to which the two thirteenth months are intercalated in the yuga is

not described in detail; it is however clear enough how it proceeded. The thirty-first lunation and again the sixty-second one were not counted, but formed together with the month immediately following a kind of double month taking its name from the second constituting member. Thus there is nominally no thirteenth month, and a proper name for the latter is therefore not required.

Again the yuga consists of sixty-seven periodical lunar months, the moon during it returning sixty-seven times to the place from which she had started at the beginning. No attempt is made in the Súryaprajñapti to group these months into years nor are they subdivided into days of equal duration; they are simply said to comprise $27\frac{7}{67}$ days each. They are, however, subdivided into two ayanas each, analogously to the division of the solar year into ayanas. This division is indeed legitimate enough as it is based on the alternate progress of the moon towards the north and south, about which details will be given later on. Less comprehensible is on the other hand the division of each periodical month into six lunar seasons, whose names answer to those of the solar seasons beginning with the rainy season; a division of this kind is of course utterly gratuitous and purposeless, and to us interesting only as a specimen of the Indian's excessive tendency to systematize.

If we now proceed to an examination of the account given in the Súryaprajñapti of the revolutions of sun and moon, we find at the outset that it differs from the statements made by Garga and in the Vedánga in one important point. According to the latter authorities (see Jyotisha-Vedánga, v. 6; this Journal for 1877, p. 415; Weber, Nakshatras II, pp. 28, 33), the yuga begins with the winter solstice, at the moment when it is new-moon, sun and moon being in conjunction in the beginning of the nakshatra Dhanishṭhá; according to the Súryaprajñapti the yuga begins with the summer solstice, at the moment when the moon is full in the beginning of Abhijit and the sun consequently stands in Pushya. The coincidence of the winter solstice with new moon marking, according to the Vedánga, the beginning of the yuga may of course actually have taken place at the time when the doctrine of the quinquennial yuga was first established and will have recurred later on from time to time; but it is evident that it could not regularly recur every fifth year. To this fact, however, as well as to the change which in consequence of the precession of the equinoxes gradually took place in the position of the sun at the time of the winter solstice, the eyes of the Hindus seem to have remained shut during a considerable period. Now it is curious to see that in this one point at least the author of the Súryaprajñapti who, on the whole, faithfully adheres to the old system and does not hesitate to take over the quinquennial yuga itself with all its glaring imperfections, considered himself entitled or

obliged to deviate from the received tradition. For once the testimony of the eyes was placed above old authorities. In the first place, the winter solstice had so far receded from the beginning of Dhanishṭhá that the change could not be ignored; in the second place, it must have so happened that at the time of the author of the Súryaprajñapti no new moon took place together with the winter solstice, while—as we may presume—some full moon happened to coincide or nearly to coincide with some summer solstice. Accordingly the beginning of the yuga was changed. Faute de mieux the summer solstice coinciding with full moon was taken as the new starting-point, and the sun's place at the time was removed from the middle of Áśleshá which it had occupied in the old system to a point in Pushya. The moon's place at the time of the summer solstice, being separated from the sun's place by half the circumference, is then at the beginning of Abhijit; the latter point marks at the same time the sun's place at the time of the winter solstice.

The account given in the Súryaprajñapti of the position of the sun at the two solstices enables us to enter into a consideration of the approximate time at which either the work itself or some older work on which it may have been based was composed. The expression "approximate" is used on purpose as the general difficulties besetting an estimation of this kind referring to Indian astronomical works are well known, and as in our case special difficulties arise in addition to them. As will be seen later on, the Súryaprajñapti throughout employs twenty-eight nakshatras of unequal extent, while the Vedánga as well as the bulk of the later astronomical literature make use of twenty-seven nakshatras of equal extent. The relation of these two systems to each other necessitates a short excursus, for the starting-point of which we take a passage in Bháskara's Siddhánta Siromaṇi (Grahagaṇita, Spashṭádhikára, 71-74, p. 93 of Bápu Deva's edition) and a parallel passage from Brahmagupta's Sphuṭa-siddhánta. The former of the two, translated, runs as follows:

"This method of finding the Nakshatras which has thus been taught in a rough manner by the astronomers for the purposes of common life, I shall now teach in an accurate form as it has been proclaimed by the ṛishis for the purpose of processions, marriages, etc. The experts have declared six (nakshatras) to have one portion and a half, *viz.*, Viśákhá, Punarvasu and the (four) nakshatras called dhruva; six to have half a portion, *viz.*, the constellations presided over by the Sarpas, Rudra, Váyu, Yama, Indra, Varuṇa; the remaining fifteen to have one portion each. The portion of one nakshatra is called the mean motion of the moon (during one ahorátra). The minutes of the circle lessened by the portions of all (the 27 mentioned) nakshatras are the portion of Abhijit, lying beyond the nakshatra of the Viśve Devas, etc." These statements are repeated in Bháskara's own

commentary, the Vásaná, where the common names of the nakshatras (Viśákhá, Punarvasu, Rohiṇí, the three Uttaras;—Áśleshá, Árdrá, Svátí, Bharaṇí, Jyeshṭhá, Śatabhishaj) are given and where Puliśa, Vasishṭha, Garga and others are said to be the Ṛishis alluded to in the text. The rough mode of computation referred to in the beginning of the above quotation is the one contained in v. 67 of the same chapter and agrees with the rule given in the Súrya Siddhánta, II, 64. According to it, when we wish to find the place of sun or moon or one of the planets in the circle of the nakshatras, we have to divide the longitude of the heavenly body expressed in minutes by 800; the quotient then shows the number of nakshatras through which the planet has already passed, and the remainder the traversed part of the nakshatra in which it is at the time. This rule therefore bases on the assumption of twenty-seven nakshatras each of which extends over one twenty-seventh part of the circle. Now, according to Bháskara, the Ṛishis taught that whenever greater accuracy is required, the nakshatras have to be considered as being of unequal extent. In the first place only fifteen of them are to be regarded as having the average extent, while six exceed that amount by one half and six others remain below it by one half; and in the second place the twenty-seven nakshatras are no longer to occupy the whole circle, but only that part of it which corresponds to twenty-seven times the mean daily motion of the moon, while the remaining part of the circle is assigned to a twenty-eighth nakshatra Abhijit. Bháskara's statements are manifestly founded on a passage met with in the 14th chapter of the Sphuṭa Brahmasiddhánta which gives the same details regarding the different extent of the nakshatras, and is introduced by the following verse—

पौलिशरोमकवासिष्ठसौरपैतामहेषु यत्प्रोक्तम्।
तन्नक्षत्रानयनं नार्यभटोक्तं तदुच्यते॥

"The calculation of the nakshatras, which has been taught in the Puliśa, Romaka, Vásishṭha, Saura, Paitámaha Siddhántas, is not mentioned by Áryabhaṭa; I therefore proceed to explain it."

And later on—

अर्धार्धादिक्षेपाणि संक्षिप्ताख्यभिक्षितानि गर्गादैः।
यस्माद् बहूनि तस्मान्नार्यभटोक्तं तदानयनम्॥

The explicit statement about number and extent of the nakshatras in the older period of Indian astronomy, which is contained in the two passages quoted from Brahmagupta and Bháskara, is of considerable interest. If the account given by these two writers is correct and there is no reason to doubt of that, it appears in the first place that the mere circumstance of only twenty-seven nakshatras being mentioned in some detached fragment of an astronomical work which we do not possess in its entirety,

would not justify the conclusion of the author of the work having been acquainted with twenty-seven nakshatras only. Nay, even the author of a treatise like the Vedánga who throughout speaks of 27 nakshatras only may have done this simply because he meant his work to be an elementary one, unencumbered by the assumption of 28 nakshatras of unequal extent. In the second place the distinct statement that the old writers on astronomy made use of Abhijit solely when greater accuracy was aimed at, and that they then made its extent to correspond to the excess of a sidereal month above twenty-seven days, certainly seems to point to the conclusion that the introduction of Abhijit into the circle of the nakshatras was an afterthought, consequent on the improved knowledge of the length of the moon's periodical revolution. With regard to the books in which, according to Bháskara and Brahmagupta, the division of the sphere into 28 nakshatras of unequal extent was taught in addition to the simpler division into 27 equal nakshatras, we have to remark that the Súrya-siddhánta known to us contains no such statement; the Saura-siddhánta of Brahmagupta may have been a different work. We are unable to control the statement with regard to the Romaka, Pauliśa, Vásishṭha-Siddhántas. Of Garga, however, we know from quotations several passages bearing on the point in question: in the first place, the passage quoted by Bhaṭṭotpala (in his commentary an Varáha Mihira's Bṛihatsaṃhitá, IV, 7 ; see Weber, Nakshatras, I, p. 309), which corroborates Bháskara's statement regarding the different extent of the Nakshatras, is, however, silent about Abhijit. As the passage stands, it would lead us to infer that Garga divided the whole circle into twenty-seven parts, the extent of fifteen of which is equal to one, of six to one half and of six to one and a half. The quotation may, however, be incomplete, and at any rate we have Brahmagupta's and Bháskara's word for Abhijit having been acknowledged by Garga too. However this may be, that Garga, as a rule, introduced into his calculations neither Abhijit nor the inequality of the extent of the twenty-seven nakshatras, appears from the places which he assigns to the sun at the two solstices, *viz.*, at the beginning of Dhanishṭhá and the middle of Áśleshá ; for if we calculate the place of the summer solstice by starting from the beginning of Dhanishṭhá and making use of the unequal extent of the nakshatras, we obtain as place of the summer solstice not the middle of Áśleshá but rather the end of it or the beginning of Maghá.

To return. The special difficulty by which we are met when attempting to compare the places assigned to the solstices in the Súryaprajñapti with the places which they occupy according to Garga and the Vedánga on one hand and the Siddhántas on the other hand, lies in the circumstance of our not knowing exactly how the two divisions of the sphere—the one into 27 nakshatras of equal extent, the other into 28 of unequal extent—were made

to correspond with each other. If we suppose—and this seems the most likely supposition—that each of the 27 nakshatras was curtailed by the twenty-seventh part of the small portion assigned to Abhijit and that the reckoning started from the beginning of Abhijit, (which according to the system of the Súryaprajñapti is the first of the series, as at the beginning of the yuga it is in conjunction with the moon), we may hazard an hypothesis with regard to the time lying between the Vedánga and the Súryaprajñapti, or rather between the observations of the solstices recorded in the two works. According to the Vedánga the winter solstice takes place in the beginning of Dhanishṭhá, according to the Súryaprajñapti in the beginning of Abhijit (which is the place of the full moon on the day of the summer solstice at the beginning of the yuga, and consequently the place of the sun on the day of the winter solstice); the two places are therefore separated by the whole of Śravaṇa and Abhijit. Having, according to the hypothesis stated above, reduced the extent of Śravaṇa (= 13°·33) by the 27th part of the extent of Abhijit, which extent is equal to about 4°·12, we obtain for Śravaṇa 13°·18; to this we add Abhijit = 4°·12; the sum *viz.*, 17°·3 indicates the extent of the displacement of the solstice during the intervening period. Allowing seventy-two years for 1° of precession, the length of this period would be about 1246 years. If we therefore knew the absolute date of the Vedánga we might state the approximate absolute date of the observation recorded in the Súryaprajñapti, on the supposition always of the manner in which the two divisions of the sphere have been adjusted to each other being the right one. But, as Professor Whitney has shown, it is scarcely possible to form any satisfactory conclusion with regard to the date of the Vedánga, and we therefore abstain from giving a positive opinion about the date of the Súryaprajñapti.

We now proceed to a detailed consideration of the hypothesis by which the author of the Súryaprajñapti tries to account for the appearances presented by the various motions of the heavenly bodies, beginning with the sun.

The three different motions of the sun which he endeavours to explain are firstly, the daily motion in consequence of which the sun seems to approach us from the East, passes through our field of vision and finally disappears in the West; secondly, the annual motion in consequence of which the sun seems to pass in the course of a year through the circle of the nakshatras, proceeding from the West towards the East; and thirdly the motion in declension according to which the sun ascends towards the north during one half of the year and descends towards the south during the other half. As in all systems which consider the daily motion of the sun to be real (not an appearance produced by the revolution of the earth

round its axis), the annual motion of the sun through the circle of the nakshatras is said to be apparent only, and produced by the circumstance of the motion of the sun being somewhat slower than that of the nakshatras, so that he daily lags behind by a certain quantity which accumulated during a whole year amounts to an entire revolution. How the Súryaprajñapti supposes the first and third motions to take place will appear from the following.

It must be remembered at the outset that the general conception of the configuration of the world which we find in the Súryaprajñapti is the same as that known from the Puráṇas. The earth is considered to be an immense circular flat consisting of a number of concentric rings, called dvípas, separated from each other by ring-shaped oceans. In the centre of the earth stands Mount Meru; around it runs the first dvípa—Jambudvípa, the only one which will concern us in the following. It is surrounded by a circular ocean, the water of which is salt (the lavaṇa-samudra). The southern segment of the Jambudvípa is occupied by the Bháratavarsha, the northern segment by the Airávata-varsha; east and west of Mount Meru are the two portions of the Videha-varsha. Sun, moon and stars revolve round Mount Meru, in circles of different height above the Jambudvípa, the same heavenly body, however, always keeping the same height. The detailed features of these motions are now according to the Súryaprajñapti as follows.

The circumstance of the sun seeming during one half of the year to approach daily more and more the north, while during the other half he seems to descend towards the south is explained in the following manner. On the longest day of the year which at the beginning of the cycle coincides with the first day of the lunar month S'rávaṇa, the sun describes round the mountain Meru a circle, the diameter of which is 99,640 yojanas. The distance of the sun from the centre of Meru amounts therefore to 49,820 yojanas. On the next day the sun describes a circle concentric with the first, and having a diameter greater by $5\frac{5}{61}$ yojánas, so that the distance of the sun, from Mount Meru now amounts to $49,820 + 2\frac{5}{61}$ yojanas. In the same manner the diameter of the circle described by the sun increases by $5\frac{5}{61}$ on the third day, fourth day, etc., up to the day of the winter solstice, which according to the system is the 183rd day after the summer solstice. On this day the sun describes round Mount Meru a circle, the diameter of which is equal to 100,660 yojanas, so that his distance from Mount Meru amounts to 50,330 yojanas. Beginning from this day the solar circles contract again, by the same quantity daily by which they had expanded during the southern progress of the sun. During the 182 days intervening between the day of the winter solstice and the day of the following summer solstice the sun describes again the same 182 circles in

which he had descended towards the south, only in reverse order, until, on the day of the second summer solstice, he has again reached the innermost circle, from which he had started a year ago. During the second year the same expanding and contracting of the solar circles repeats itself and so on. The fact of the sun seeming to ascend towards the north during one half of the year, while he seems to descend towards the south during the other half is therefore explained by the supposition that he approaches us during the former half, while he recedes from us during the latter half. The system does not assume that he actually ascends or descends; for all the circles described by him are at an equal height above the Jambudvípa; he only appears to us to stand lower at the winter solstice than he does at the summer solstice, because at the former period he has receded from us to the amount of five hundred and fifty yojanas. The exact localities too above which the sun describes his daily circles are defined. The innermost circle, *i. e.*, the circle nearest to Mount Meru, which the sun describes on the longest day, would, when projected upon the earth, be distant 180 yojanas from the outer margin of the Jambudvípa. The second circle approaches nearer to that margin, the third still nearer, and so on, until the circles of the sun are no longer above the Jambudvípa itself but above the salt ocean, the lavaṇoda, which surrounds the Jambudvípa. Finally on the shortest day of the year the sun describes a circle which, in projection, is distant 330 yojanas from the edge of the Jambudvípa. After that he again approaches the Jambudvípa, and on the next summer solstice he has again entered into it to the amount of 180 yojanas. The technical term by which this recurring progress of the sun towards the Jambudvípa and the salt ocean is denoted in the Súryaprajñápti, is उगाहइ or ओगाहति (-ते); the sun is said to merge himself, or to enter to a certain distance into the Jambudvípa or into the salt ocean accordingly as his circles are vertically above the land or the surrounding sea.

In connexion with the sun's motion in circles of different diameter, the Súryaprajñapti treats of the increase and decrease of the length of the day. As in the Jyotisha-Vedánga, the length of the day of the summer solstice is estimated at eighteen muhúrtas, that of the shortest day at twelve muhúrtas. The days between the two solstices are erroneously supposed to decrease or increase by a uniform quantity, which is easily found to be equal to $\frac{6}{183} = \frac{2}{61}$ of a muhúrta.

A number of opinions of other teachers agreeing with the theory stated above in its general features, but differing in the figures, are likewise given by the Súryaprajñapti.

Different opinions regarding the extent of the solar circles are given in I, 8 and, which comes to the same, different opinions about the distance of the two suns from each other in I, 4. According to this chapter there

were six different opinions about the distance of the two suns from each other on the longest day when the sun—or the two suns—describe the innermost and smallest circle. According to some teachers, the distance of the two from each other, or in other words the diameter of the circle they describe amounts to 1,133 yojanas, according to others to 1,134 yojanas; according to others again to 1,135 yojanas. Most probably we have to combine with these statements the statements given in the next chapter (I, 5) regarding the different opinions prevailing on the extent to which the sun "immerges" himself into the Jambudvípa and into the salt ocean. There we read that, according to one opinion the sun moves on the longest day in a circle which projected on the Jambudvípa is distant 1,133 yojanas from the edge of the latter, while on the shortest day he describes a circle above the salt ocean at the distance of 1,133 yojanas from the Jambudvípa. According to the opinions of two other sets of teachers, the number of yojanas in both cases is 1,134 and 1,135. If we combine these measures with the measures of the diameter of the innermost solar circle given above (and the sameness of the figures seems to entitle us to do so, although this is by no means explicitly stated), we get for the diameter of the whole Jambudvípa 1,133 (= diameter of the innermost circle) + 2 × 1,133 (= distance of the innermost circle from the edge of the Jambudvípa on both sides), therefore altogether 3,399 yojanas; or, starting from the numbers 1,134 and 1,135, 3,402 or 3,405 yojanas. These are very moderate dimensions compared with the 100,000 yojanas, which length the author of the Súryaprajñapti himself attributes to the diameter of the Jambudvípa, and we shall not be mistaken in ascribing to opinions of this nature a considerably greater antiquity than to those represented by the Súryaprajñapti. Besides, there is another circumstance in favour of such a view. The Súryaprajñapti throughout makes use of the relation $\sqrt{10} : 1$ for calculating the circumference of a circle. Thus for instance the diameter of the Jambudvípa being 100,000 (yojanas), its circumference is said to amount to 316,227 yojanas 3 gavy. 128 dhan. $13\frac{1}{2}$ añg. But those teachers who stated the diameter of the innermost solar circle to amount to 1,133 or 1,134 or 1,135 yojanas stated at the same time that its circumference amounts to 3,399 or 3,402 or 3,405 yojanas, *i. e.*, they made use of the relation 3 : 1 for calculating the circumference of a circle from its diameter. The adoption of this very rough approximate value seems to point back to a comparatively ancient time.*

* It seems that all Jaina books take $1 : \sqrt{10}$ as expressing the relation of the diameter to the circumference. See for instance Bhagavatí Sútra II, 1. 45 (Weber, p. 264), where, however, some confusion seems to have crept into the figures. The old and simple relation 1 : 3 is found for instance in the Bhúmiparvan contained in the Bhíshmaparvan of the Mahábhárata. There the circumferences of the planets are

Three more opinions concerning the distance of the two suns from each other on the longest day are quoted. According to the first, one whole dvípa with the addition of the surrounding ocean intervenes between the two; according to the second two dvípas and two oceans; according to the third three dvípas and three oceans. The distance in yojanas is not given. Two more opinions concerning the extent to which the sun enters into the Jambudvípa are stated; according to some the sun enters on the longest day into half the Jambudvípa and on the shortest day into half the salt ocean; the distances in yojanas are not mentioned. And according to others the sun enters neither into the Jambudvípa nor into the salt ocean, but moves in the interval (apántarála) of the two; how we have to imagine this interval does not appear.

The eighth chapter of the first book contains a long exposition of the dimensions of the circles described by the sun. Four different dimensions are stated. Instead of simply giving the length of the diameter, the length and breadth (áyáma and vishkambha) are given; these two are of course equal in a circle. Then the circumference of the circle is given, according to the ratio $\sqrt{10} : 1$, and finally the "váhalya," the thickness of the circle, *i. e.*, the diameter of the space filled by the mass of the sun or more simply the diameter of the sun himself. This amounts according to the Súryaprajñapti to $\frac{48}{61}$ of a yojana. The diameter and the circumference of the circles are of course continually changing, the circle described on the longest day having the smallest dimensions and that described on the shortest day having the greatest. The dimensions of the small circle and the amount of the daily increase have been mentioned above; it is therefore not necessary to follow the Commentator into the very tedious calculation of the dimension of each daily circle. The opinions of three other teachers on the dimensions of the circles, according to which the diameter amounts to 1,133 yojanas etc., have already been mentioned; the thickness of the circle, *i. e.*, the diameter of the sun is held by them to amount to one yojana.

We turn now to the statements regarding the velocity with which the sun moves in his different circles, and among these at first to those made by the Súryaprajñapti itself. The calculation is a very simple one. Each daily circle being described by two suns, each of which travels through half of it in thirty muhúrtas, the whole circle is described by one sun in sixty muhúrtas, and consequently we have, in order to find the velocity of the sun, to divide the periphery of the daily circle by sixty; the quotient is the number of yojanas travelled through by the sun in one muhúrta. Thus the sun, when travelling in the smallest innermost circle, the circumference

stated in numbers which are the threefold of the numbers expressing the diameters: चन्द्रमास सहस्राणि राजनेकादश स्मृतः। विष्कम्भेन कुरुश्रेष्ठ त्रयस्त्रिंशत्तु मण्डलम् etc.

of which is 315,089 yojanas long, passes in one muhúrta through 5,251 $\frac{32}{60}$ yojanas. On the following day both suns travel in the second circle which is somewhat larger than the first one, and consequently the suns having to describe a larger space in the same time, *i. e.*, during the duration of a nycthemeron travel somewhat faster, pass in one muhúrta through 5,251 $\frac{47}{60}$ yojanas. Thus day after day the speed of the two suns is increasing in accordance with the continually increasing extent of the diurnal circles, until on the day of the winter solstice both suns travelling in the outmost circle pass through 5,305 $\frac{15}{60}$ yojanas in one muhúrta. Beginning from this day their speed diminishes as they are again approaching the innermost circle, until on the day of the next summer solstice their rate of speed is again at its minimum. In connexion with this discussion of the swiftness of the sun, the Súryaprajñapti treats of the question of the distance from which the light of the sun becomes visible to the inhabitants of the Bharata-varsha. By this distance we have, however, to understand not the distance of the sun from the Bharata-varsha in a straight line, but rather that part of the sun's daily circle which lies between the point of the sun's rising and the meridian. It is well known, says the Commentator, that the sun becomes visible to the eye of man at a distance equal to half of the extent (kshetra) over which he travels during the whole day, *i. e.*, at the time of his rising, his distance from us (=from our meridian, although this is not expressly stated in the Súryaprajñapti) is half of the arc which he describes during the whole day. The length of this arc has to be measured simply by the time which the sun takes to travel through it. Thus, for instance, on the longest day the sun is visible to the inhabitants of the Bharata-varsha during eighteen muhúrtas out of thirty; from the moment of his rising he will therefore take nine muhúrtas to come up to the point straight in front of us (to the meridian). Now we have seen before that on the longest day the sun travels over 5,251 $\frac{32}{60}$ yojanas in one muhúrta; consequently he travels in nine muhúrtas over 47,263 $\frac{24}{60}$ yojanas. This therefore is the distance—expressed as an arc of the diurnal circle—at which he becomes visible to the eye of man. On the shortest day on the other hand the sun is visible for twelve muhúrtas only; we have therefore to multiply the amount of his motion in one muhúrta by six in order to find the distance at which he first appears to the eye of man on that day.

Regarding the swiftness of the sun four other opinions are recorded by the author of the Súryaprajñapti. According to some teachers, the sun travels in one muhúrta over six thousand yojanas, and as far as it appears this rate of motion is the same in whatever circle the sun is moving. How these teachers accounted for the fact of the sun taking the same time to travel through a large circle as through a small one is not explained. The

amount of space illuminated on each day (the tápakshetra), expressed as arc of the diurnal circle of the sun, they calculated in the same manner as the author of the Súryaprajñapti, *viz.*, by multiplying the amount of motion in one muhúrta by the number of the muhúrtas of the day. Thus the tápakshetra on the longest day would amount to 108,000 yojanas, that on the shortest day to 72,000 yojanas. According to the opinions of two other schools, the motion of the sun in one muhúrta amounts to 5,000 yojanas or 4,000 yojanas. Here too nothing is said about any variation in the sun's speed at different times of the year. The tápakshetra is calculated in the manner stated above. The last opinion mentioned is that of some teachers who held the rate of speed of the sun to be different during different periods of the day. According to them, the sun passes over six thousand yojanas in the muhúrta after his rising and in the muhúrta preceding his setting, over four thousand yojanas during the muhúrta in the middle of the day and over five thousand yojanas in all other muhúrtas.

The various opinions prevailing with regard to the rising and setting of the sun are detailed in the first chapter of the second book. The opinion of the author clearly appears from what has already been stated. There is no real sunrise or sunset; the sun or rather the two suns revolving round Mount Meru appear to rise to the inhabitants of some particular place at the moment when they enter their field of vision, and they appear to set when they leave it. In reality they always move above the Jambudvípa at the same height, estimated by the Súryaprajñapti to amount to eight hundred yojanas. At the beginning of the yuga at sunrise on the first of Srávaṇa the Bhárata sun becomes visible to the Bhárata-varsha having reached the south-east point of his diurnal circle; diametrically opposite to it, *viz.*, in the north-west point of the same circle the Airávata sun appears to rise to the inhabitants of the tracts north of Mount Meru. During the course of this day the Bhárata sun therefore illuminates the countries to the south; the Airávata sun those to the north of Meru. At the time of sunset the Bhárata sun having passed through the southern segment of his circle disappears from the view of the people south of Meru and enters the view of those west of Meru; these latter therefore have their day while it is night in Bhárata-varsha. At the same time the Airávata sun appears to have set to the people north of Meru and to have risen to those east of Meru. On the second day the Bhárata sun rises to the countries north of Meru and the Airávata sun to the Bhárata-varsha. On the third morning the Bhárata sun has completed a full circle and therefore again rises to the Bhárata-varsha while the Airávata sun again rises to the regions north of Meru. And so on *ad infinitum*. We may recall here a parallel passage from the Vishṇupuráṇa (II, 8), tending to illustrate how sunrise and sunset were conceived to take place on the hypothesis of the sun (the Puráṇas

know of one sun only) moving round Meru. "The sun is stationed at all times in the middle of the day (*i. e.*, it is always midday at that place above which the sun is) and over against midnight in all dvípas. In the same manner rising and setting are at all times opposite to each other in all the cardinal and intermediate points. When the sun becomes visible to any people, to them he is said to rise, and wherever he disappears from the view there his setting is said to take place. Of the sun which is always (above the earth) there is neither setting nor rising; his appearance and disappearance are called his setting and rising."*

The Súryaprajñapti adds an interesting account of other views regarding the sideway-motion (tiryag-gati) of the sun. According to some the sun is not a divinity, but only a mass of rays which in the morning form themselves in the East into a globular shape, pass sideways along this visible world, and in the evening dissolve again in the West. This process repeats itself daily. According to others the sun is the well-known divinity; but each morning he is born anew according to his nature in the ether in the East (svabhávád ákáśa utpadyate), passes along this world and dissolves (vidhvaṃsate) at evening in the ether in the West. According to others the sun is the mighty everlasting god known from the Puráṇas; in the morning he rises in the East, passes over this world, and at evening sets in the West; from thence he returns below to the East, illuminating the parts below. This—the commentator says—is the opinion of those who hold the earth to be a globe; it finds great favour at present among the tírthántaríyas and is thoroughly to be studied in their Puráṇas. This opinion has three sub-divisions. Some say the sun returning at daybreak from the parts below rises in the ether (ákáśe) and sets in the ether; others say he rises or originates (uttishṭhati utpadyate) in the morning on the summit of the mountain of rising (udaya-bhúdhara-śirasi) and perishes (? vidhvaṃsate) in the evening on the summit of the mountain of setting (astamaya-bhúdhara-śirasi); this repeats itself daily. (But, if he "utpadyate" and "vidhvaṃsate," how can he pass under the earth during the night?). Others say he rises in the morning on the mountain of rising and enters in the evening into the mountain of setting, illuminates during the night the subterraneous world and rises again from the mountain of rising. Others say, he rises, that is, originates from the eastern ocean in the morning, pe-

* Mr. Fitz-Edward Hall (Wilson's Vishṇu Puráṇa, Vol. II, p. 242) directs our attention to the "heliocentricism" taught in this passage. But clearly there is no trace of heliocentricism to be found in it. He apparently is misled by the words एकस्मिन् सर्वतः सतः which he translates "of the sun which is always in one and the same place." But this translation is quite untenable, since the Vishṇu Puráṇa most unambiguously teaches the sun's revolution round Mount Meru.

rishes at evening in the western ocean (same objection as above); others again, he rises from the eastern ocean, enters at evening into the western ocean, passes during the night through the subterraneous world, rises again from the eastern ocean. The last opinion mentioned is not very clear and an account of it is therefore not given in this place.

The third and fourth books contain particulars about the tápakshetra, *i. e.*, that part of the Jambudvípa which on each day is illuminated by the sun or rather by the two suns. The shape of this tápakshetra the Súryaprajñapti compares to that of a kalambuká-flower turned upwards, a comparison which has to be understood in the following manner. Each of the two suns illuminates a sector of the large circle formed by the Jambudvípa. These sectors are, however, not complete, but a piece is cut off from each by Mount Meru which standing in the middle of the circle repels by its own superior radiancy the rays proceeding from the two suns and therefore is not included in the tápakshetra. The interior border of the sectors is thus formed by a part of the circumference of Mount Meru, their outward border by a part of the circumference of the Jambudvípa. Between these two sectors of light there lie two sectors of shade (andhakára); whatever part of the Jambudvípa is covered by the two former enjoys day at the time while it is night in the regions covered by the dark sectors. As the two suns revolve these four sectors revolve with them, sweeping over the whole extent of the Jambudvípa and producing alternate day and night in all its parts. The relative magnitudes of the tápakshetra during the different parts of the year is estimated in accordance with the statements about the relative length of night and day. On the longest day the two suns, moving in the innermost circle, together illuminate three-fifths of the Jambudvípa, each of them three-tenths; on the shortest day they illuminate two-tenths each, together two-fifths. On the day after the summer solstice when the suns have entered into the second circle, and are moving at a greater distance from the centre, the extent of the tápakshetra decreases accordingly, so that it then equals $\frac{3}{5} - \frac{1}{5 \times 183} = \frac{3}{5} - \frac{1}{915}$ of the whole Jambudvípa only; the same decrease repeats itself daily up to the day of the winter solstice when the extent of the illuminated portion of the Jambudvípa has reached the minimum stated above. From that period it again begins to increase by the same portion daily. From this the absolute dimensions of the tápakshetra or, to express it more conveniently, of one of the two sectors composing the tápakshetra are easily derived. The two straight lines by which it is limited are equal in length to the radius of the Jambudvípa less the radius of Mount Meru (50,000 — 5,000 = 45,000 yojanas). To this we find in one passage of the Súryaprajñapti added the sixth part of the breadth of the salt ocean surrounding the Jam-

budvípa, up to the end of which the light of the sun seems to reach, on the longest day at least; this gives altogether 78,333⅓ yojánas (= 45,000 + $\frac{200{,}000}{6}$). In the statements regarding the measure of the two arcs limiting the sector, no reference is made to the salt ocean. We find these measures for the longest day by dividing the circumference of Mount Meru as well as that of the Jambudvípa by ten; three of these ten parts of the first kind give the interior arc of the truncated sector, three of the second kind the exterior arc. On the shortest day we have to take two-tenths instead of three, and there is no difficulty in finding the corresponding increase or decrease on all days between the summer and winter solstice. In the same manner the dimensions of the andhakára, the dark portion of the Jambudvípa, are readily ascertained. Finally some statements are made about the distances to which the light of the two suns reaches above, below and towards both sides. It is said to reach to a thousand yojanas above (above the chariot of the sun, svavimánád úrdhvam). Further it is said to reach down to the depth of 1,800 yojanas, for which the following explanation is given. The sun is at the height of 800 yojanas above the earth, and below the surface of the earth at the depth of 1 000 yojanas are the subterraneous regions (adholaukikagrámáḥ), down to which the sun's rays are penetrating. No further details about these subterraneous dwellings are given. Towards both sides, the east and the west, the light of the sun is said to extend to the distance of 47,263 $\frac{2}{61}$ yojanas.

For the sake of completeness, the various other opinions with regard to the subjects treated in the last paragraphs are added. Some say that the sun and moon illuminate one dvípa and one ocean; while according to others the numbers of dvípas and oceans illuminated are 3, 3½, 7, 10, 12, 42, 72, 142, 172, 1042, 1072. No details are given. One chapter contains the enumeration of a number of very fanciful opinions about the form of the tápakshetra, which it would, however, be purposeless to extract in this place.

On the assumption that the sun describes every day a circle which is at the distance of 2 $\frac{5}{61}$ yojanas from the circle described on the preceding day, the question naturally suggested itself, how the sun passes over from one circle into the next one. This question is treated in I, 6, and II, 2, where two different opinions are expounded which, although the account given of them is not altogether clear, appear to be of the following nature. According to some the sun enters from one circle into the other "bhedaghátena" which (bheda being explained to signify apántarála) seems to mean that the sun passes from one circle into the next one by moving over the distance separating the two all at once. Thus the sun would really move in perfect circles and the motion across from one circle into the

other would be a momentary one only. The other opinion, and to this the Súryaprajñapti seems to adhere, is that the sun does not in reality move in separate perfect circles, but rather in an uninterrupted spiral line. As the Súryaprajñapti expresses it, the sun begins from the moment he has entered the first circle to move "śanaiḥ śanaiḥ" across towards the second circle, and as soon as he has reached the second circle, he begins to move towards the third circle, etc. The term "karṇa" which occurs in this description of the sun's motion seems to denote the spiral line which passing across the whole room between the two circles connects the two; a line which might properly enough be called "karṇa," *i. e.*, diagonal. On this hypothesis then we should have to remember that the sun is only for convenience sake said to describe a separate circle on each day, and that in reality he is supposed to describe a continuous spiral line.

After having thus given a succinct account of the Súryaprajñapti's theory concerning the motion of the sun, we now proceed to consider the statements referring to the motion of the moon.

(To be continued.)

Memorandum on Clay Discs called "Spindle Whorls" and votive Seals found at Sankisa, Behar, and other Buddhist ruins in the North Western Provinces of India.—*By* H. Rivett-Carnac, Esq., C. S., C. I. E., F. S. A. (With three Plates.)

Last year I submitted for the inspection of the Asiatic Society specimens of stone and clay discs, similar to what are called "spindle whorls" by the Antiquaries of Europe, found by me at the Buddhist ruins of Sankisa, Behar, &c. in the Fatehgarh District, N. W. Provinces of India. Certain clay seals stamped with the Buddhist formula found in the same localities were also exhibited. The resemblance between these "spindle whorls" and those described and figured by Dr. Schliemann in his work "Troy and its Remains" was briefly noticed by me at the time. Since then I have obtained some more specimens of these discs and seals, and I think it well that they should be submitted for the inspection of the Asiatic Society, and that the attention of its Members and of other Antiquaries should be directed to the resemblance to be traced between these remains and those found in the ruins of Hissarlik and in many parts of Europe.

First as regards so called "spindle whorls." When we were encamped at Kanouj, Sankisa and Behar Khas in the Fategarh district, the village urchins were encouraged to bring to us everything in the shape of "Antiquities" that could be grubbed out from these extensive ruins and from neighbouring mounds. These sites, as is well known, present many features

of resemblance to those which Dr. Schliemann dug through at Hissarlik, described at length in his work upon Troy. That is to say, it is generally found in the case above-mentioned that the site has been selected on account of some Kunker Hill which, rising out of the flat alluvial soil of the Doab, offers a point of vantage for the building of a fort or city. Here, as at Hissarlik, these sites often bear the traces of several distinct colonies. The mud buildings of one set of colonists have been razed by their conquerors or successors to build thereon houses and temples which have again been levelled to form the foundations of the habitations of later settlers. The high mounds, on which part of the present town of Kanouj is perched, is to be accounted for in this way, and there can be little doubt that if shafts were to be carried through the ruins there, after the manner adopted by Dr. Schliemann at Hissarlik, the traces of several distinct periods might be unearthed. What has been said of Kanouj holds good in regard to Sankisa, Ramnuggur and other ruins. Much has not yet been done to explore these localities, and the recent interesting find of Mitra coins, reported by me to the Society, indicates that careful investigation might prove remunerative to antiquarian research. The heavy rains of India are, however, of much assistance in running amateur sections through the ruins, and in exposing from time to time relics of more or less interest. Amongst these may be classed the "spindle whorls" now to be noticed, many of which together with coins, beads, etc. are collected and set aside by the villagers as possessing some mysterious significance, and are brought out for sale when the District Officer or some occasional visitor camps near the place.

Of these clay discs and their stone prototypes four distinct classes are to be noticed:

A. Terra Cotta Discs, plain and ornamented.

B. Ditto with a hole through the centre.

C. Terra Cottas "in the form of a top and the crater of a volcano" (I use the words of Dr. Schliemann, Troy, p. 38 to describe these peculiar specimens).

D. Clay Balls, plain and ornamented.

With respect to A, Clay or Terra Cotta discs, these were brought to [illegible] in enormous quantities, and, if disposed to do so, we might have purchased [illegible] carried off several elephant loads of this description of relic. At the [illegible] I did not attach much importance to them, and am sorry now that no [illegible] ful selection was made of those bearing different styles of ornamenta[illegible] They are all of red or black clay well baked. In size they vary from 1 inch to 2 inches in diameter and are about ¼ of an inch in thickness. The majority of them bear a rough ornamentation at the edges only, see Plate XIII, sketches 1 and 2. Others again show traces of more elaborate design and workmanship. Some of these are figured in sketches 3 to 7.

On one, No. 5 of my sketch, will be seen the broad arrow noticeable on Schliemann's No. 458. On another, No. 6, is what looks like the sign of Saturn or what Dr. Schliemann calls the "mystic rose," well known on Buddhist coins and in Buddhist art. They all have more or less ornamentation at the edges, resembling the spokes of a wheel or possibly the rays of the sun.

I also obtained at Sankisa several stone discs of nearly the same shape as the Terra Cottas. They are all highly polished. One is of black marble, another of crystal. Several are of red marble, and the material must have been brought from a distance, as no stone save kunkur is to be found within many miles of Sankisa. It will be noticed that all these stone specimens are grooved at the edges, see the section in sketch No. 8, whereas but few of the clay specimens have received such treatment.

Type B, sketch No. 9, on Plate XIV consists of clay discs similar in most respects to the foregoing, save that a hole has been drilled through the centre of each. I did not pay any particular attention to the proportion in which these different classes were brought to me in camp. But I find that I have many more of the plain discs than of those which have been pierced. There can be little doubt, however, that many hundreds of the pierced ones might have been obtained on the spot, and I am sending to ascertain whether any more ornamented specimens are procurable. The specimen marked and figured in sketch No. 10 is of grey granite. It bears the same relation to the pierced clay discs as the stone and crystal discs mentioned above bear to the clay whorls of type A. In the centre is a hole, round which are six concentric circles.

The specimen figured in sketch No. 11, is of a somewhat different type from the foregoing, as a section of the sketch will explain. The impressions of the spokes of a wheel with dots between each spoke appear to have been made in a stamp or mould. I find I have only two of this class in my collection. But doubtless hundreds more might have been obtained had I not been afraid of burdening myself during the march with too large a collection of such specimens.

Of type C, Sketches Nos. 12 and 13, on Plate XIV, which may be described in Dr. Schliemann's words as being in the form of a "top or crater of a volcano" I have, I find, but 4 or 5 specimens; I have little doubt that large numbers were offered to me, but at the time they did not appear to possess any particular significance. It was only in tumbling out a large number of discs from the box, in which they had long been kept, that I recognised this type of the illustrations of Dr. Schliemann's book, just consulted with reference to the Discs A and B mentioned above. The specimens I have with me do not bear any marks of ornamentation. Further search may perhaps bring better specimens to light. (Since this was written some ornamented ones have been found.)

Lastly we have type D, Clay Balls, Plate XIV, sketches Nos. 14, 15, 16, resembling somewhat those figured by Dr. Schliemann. Several of them are roughly ornamented, and the designs, such as they are, will be seen from the sketches.

I hardly know how it happened that these specimens were carried away by me. Certainly no importance was attached to them at the time; and they would have escaped my notice altogether, had I not seen, when comparing the clay discs, the sketches of somewhat similar balls figured in the last pages of Dr. Schliemann's book.

Lastly, I have also figured two specimens Nos. 17 and 18 which seem to approach type C. And an enamelled glass bead No. 19.

This bead is similar to that figured in Thomas' Prinsep, Pl. IV, No. 13. These beads are found in large quantities together with crystal, onyx cornelian and others at Sankisa and similar ruins. It seems desirable to figure the specimen with this paper in order to ascertain whether similar ones are found in Europe or elsewhere. The village urchins during the rains make a practice of collecting these beads, and they are usually given to *fakirs* or devotees. Seeing such a necklace worn by an old *fakir* led me to enquire whence the beads came. And I had little difficulty in procuring a variety sufficient for about nine necklaces.

I have now to direct attention to the resemblance between the specimens above described and figured, and those discovered by Dr. Schliemann at Hissarlik and noticed at great length and figured in large numbers in his well known work upon Troy.

As regards type A, clay discs more or less ornamented, without the central hole, I cannot be quite certain that this type was found by Dr. Schliemann. I do not see that any distinct mention is made of unpierced discs, and it is not quite clear from the sketches in Dr. Schliemann's work, whether, what is referred to as the Central Sun on the Discs figured in plates 22 and 23, is a hole drilled through the centre or is a depression or ornamentation representing the sun. Still, even if this particular type was not found at Hissarlik, it is found in Italy, and, as will be shewn further on, the resemblance between the remains found at Hissarlik and those of Italy is referred to by Dr. Schliemann.

Dr. Schliemann writing of his discoveries at page 187 of his work above quoted, thus refers to the discs:

"During the last few days we have also found, in the strata next above the primary soil, at a depth of from 16 to 36 feet, a number of round brilliant black terra cottas of exquisite workmanship; most of them much flatter than those occurring in the higher strata and resembling a wheel; many are in the shape of large flat buttons. But we also meet with some in the form of tops and volcanoes which differ from those found in the higher strata only by the

fineness of the terra cotta and by their better workmanship. The decorations on these very ancient articles are, however, generally much simpler than those met with above a depth of 10 meters (33 feet) and are mostly confined to the representation of the sun with its rays, or with stars between the latter, or of the sun in the centre of a simple cross, or in the middle of four or five double or treble rising suns. At a depth of 6 meters (20 feet) we again found a round Terra Cotta in the form of a volcano, upon which are engraved three antelopes in the circle round the sun.

"At a depth of from 5 to 8 meters (16½ to 26 feet) a number of terra cotta balls were found, the surface of each being divided into eight fields; these contain a great many small suns and stars, either enclosed by circles or standing alone. Most of the balls, however, are without divisions and covered with stars; upon some I find the swastica and the tree of life, which, as already said, upon a terra cotta ball found at a depth of 26 feet, had stars between its branches." (Schliemann's Troy, p. 187.)

The above extract embraces not only the so-called spindle whorls, but mentions the volcano-shaped "whorls" of type C found at Sankisa and type D brought away by me from the same place. The discs were found by Dr. Schliemann of terra cotta, of marble and of crystal. So at Sankisa did we find clay, marble and crystal discs.

A comparison of the Plates appended to Dr. Schliemann's volume with the specimens submitted by me and the sketches which accompany this paper will, I think, shew that there is at least some resemblance between the remains found at Hissarlik and those at Sankisa.

On nearly all these discs will be seen what are constantly referred to as the spokes of the wheel or the rays of the sun. I have placed side by side with my sketches a copy of the whorl engraved by Dr. Schliemann at page 137. It might fairly be taken to be a representation of the whorl given in Plate XIV, Sketch 10 appended to this paper.

Then my collection is unfortunately in no way large or complete. When at Sankisa, I had little idea of the significance of these remains or their resemblance to well known types, and I only purchased a few of them in the manner that I collect everything that seems to be unusual or strange. Further search may possibly bring out even more remarkable points. The few specimens that I have succeeded in obtaining bear, however, a resemblance, not only in shape, but also in ornamentation, to those figured by Dr. Schliemann, sufficient to render the subject interesting. The broad arrow of my Sketch No. 5 and the Mystic Rose or sign of Saturn, or the numeral four of my Sketch No. 6, are all to be traced among Dr. Schliemann's specimens; and then again on the balls some similarity in ornamentation is to be traced.

It would perhaps hardly be right to attach much importance to the

fact, that one or two clay discs were found in Buddhist remains in India, and that discs of somewhat the same type were unearthed at Hissarlik. But here we have, not only pierced discs of type B, but the Volcanoes C and the Balls D, all three types resembling in some degree the three types of Hissarlik and all three types bearing somewhat similar forms of ornamentation.

Again it is to be noticed that the remains at Sankisa are undoubtedly Buddhist. Sankisa as is well known was a celebrated place of pilgrimage, being sacred as the spot at which Buddha is supposed (as described by General Cunningham, Vol. 1, Archæological Reports) "to have descended from the Trayastrinsa heaven by the ladder of gold or gems, accompanied by the gods Brahmá and Indra."

The place was visited and described by the Chinese pilgrim Fa Hian early in the 5th century, and by Hiouen-Thsang in the 7th century A. D. A detailed account of these interesting ruins will be found in General Cunningham's Archæological Report above alluded to.

Now the ornamentations on the Terra Cottas of Hissarlik, if they are not Buddhist, certainly bear a close resemblance to the ornamentations on coins, buildings, etc., which in India are generally supposed to be Buddhist.

Thus the wheel continually recurs in Schliemann's sketches, together with the Swastika. And what Schliemann calls the Mystic Rose, and Fergusson the Trisul ornament is quite as frequent. The Sacred Tree, the Fire Altar and the Deer are also almost as common. In fact, we have every one of the Buddhist symbols of the well known type of the so-called Buddhist coin, figured in No. 1, Plate IV, Thomas' Prinsep, and of which an engraving is given at page 17 of Fergusson's Indian and Eastern Architecture. Mr. Fergusson points out, however, that there is some doubt whether these symbols really are Buddhist, and at the page above referred to, writes, "One coin of the period is well known. It belongs to a king called Kunanda or Krananda generally assumed to be one of the nine Nandas with whom this dynasty closed. In the centre on one side, is a dagoba with the usual Buddhist Trisul emblem over it, and a serpent below it: on the right the sacred Tree, on the left the Swastika with an altar (?) on the other side a lady with a lotus (Sri ?) with an animal usually called a deer, but from its tail more probably a horse, with two serpents standing on their tails over its head which have been mistaken for horns. Over the animal is an altar, with an umbrella over it. In fact a complete epitome of emblems known on the monuments of the period, but savouring much more of Tree and Serpent worship than of Buddhism as it is now."

Dr. Schliemann at page 38 of his work refers to the resemblance between the Terra-Cottas of Hissarlik and those of Italy. This directed my attention to Gastaldi's work. The following extract will show that if it be considered that the resemblance between the remains at Sankisa

and Hissarlik is not established, such doubt can hardly exist regarding the Indian and Italian remains.

Gastaldi says: "There are very many of these objects, for the greater part of Terra-Cotta, more or less discoidal, or conical, or spheroidal, pierced in the centre, to which the Archæologists of France and Germany, as well as our own, have given the name of spindle-whorls. The paste of the spindle-whorls is not, for the most part equal to that of earthenware; instead of the grains of sand, we find powdered carbon and ashes; the colour is ashy in the internal parts, and ash colour varying into yellow and red on the outside. Some few spindle-whorls are black, and of a substance probably similar to the thinner vases, and, like a great number of these, are shining externally as if with varnish. They are very various in form; and although eight different ones have been represented by you, from those which, in the course of the summer, we sent from Campeggine, courteously presented by the brothers Cocconi, not one represents the other six, collected in the sequel, in the marl-beds. Some few bear marks scratched upon them, and are among those you have had engraved (Fig. 25).

"Besides all the spindle-whorls of earth, there were dug up from the marl-beds of Castellazzo di Tontanellato, three others, which are cut out of different substances. One was made out of a stag's horn, it is in the shape of a cone, and is very highly polished; the second of stratite, of a greenish tint, and spheroidal; the third, of a whitish limestone (calcare), is disc-shaped, brought to a high degree of polish, and certainly manifests an advanced epoch in art among the people who used such implements. Among the objects in the Museum of Antiquities at Parma, which are of uncertain derivation, there are twenty spindle-whorls, some in limestone, stratite, and even amber, but the greater part of earth; some are polished, some are ornamented with circles, concentric with hole pierced in them, or in concentric lines disposed in groups on the back of the spindle-whorl. We find among these the transition from the more depressed discoidal form, almost medallion (nummulik) to the acute conical. Some one of those in terra cotta is said to have been collected from the ruins of the Roman City of Velicia. The different forms, finish and substances of the spindle-whorls would lead us to suppose that they must have served for various uses in proportion to their diversity; perhaps the most beautiful and carefully worked were amulets, or else buttons; the others weights, used either for nets or in weaving."

"Besides all the earthenware and all the spindle-whorls which we have spoken of, we meet in the marl-beds with other small objects in earth, badly baked, in form disc-shaped, without any hole, sometimes ball-shaped (pallottola), of which it is impossible to divine the use which they served."

(Lake Habitations and Prehistoric Remains in Northern and Central Italy. B. Gastaldi, pp. 44, 45, 46, 47.)

In Italy these mysterious articles are found of clay and marble, as in India. The ornamentation is the same and in Italy also are found the disc-shaped Terra Cottas *without any hole* similar to those of North Western India. It is hardly necessary to burden this paper with any more sketches. The Italian remains are almost exactly the same as those of Schliemann, but I cannot resist the temptation of copying the specimen marked 8 B which will be found figured at p. 45 of Gastaldi's work. It is almost identical with No. 12 of those figured by me.

Next as to the use to which these remains were placed. Dr. Schliemann discusses the subject at length in several places in his valuable work on Troy. And it will be seen that Gastaldi is puzzled as to their significance. Dr. Schliemann arrives at the conclusion that, although some of them may have been used as spindle-whorls, the greater number of them were votive offerings. And Gastaldi considers that some at least were amulets. The symbols on most of those found at Hissarlik would seem to leave little doubt of their religious character. Of the Indian specimens, it is not easy to say why some should have the central hole and others should be unpierced. But, if they are votive offerings, the fact that the pierced ones were found in smaller quantities at Sankisa than those without the hole, may possibly be explained by a practice, which was noticed by me years ago at some shrines of pilgrimage in the Central Provinces. There the pilgrim, when he makes a vow or implores a favour, smeares his right hand with red colouring matter, and impresses it, fingers upwards, on the wall of the temple, leaving there a mark like the Red Hand of Ulster. If the favour, the birth of a child or whatever it may be, is granted by the presiding deity, the pilgrim is supposed to return to the shrine the following year, and to impress on the wall a similar mark, the fingers of the hand this time pointing downwards. It was very noticeable that the latter marks were well in the minority, and it was carefully explained by the local priests that this was not to be accounted for by the supposition that the deity was slow in his favours, but that, in truth, the suppliants, when they had obtained what they wanted, were not always mindful to return and to fulfil their vows. Perhaps in this way the proportion of the unpierced to pierced discs may be explained. The unpierced ones being offered when a favour was implored, the pierced ones when it was obtained.

Be this as it may, the view that these discs are votive offerings is supported by the religious character of the symbols, already alluded to, found on the whorls of Hissarlik and Sankisa. Since I commenced to write this paper, I have received a copy of Alabaster's "Wheel of the Law." At Fig. 8 A will be found a copy of the sketch of the Buddhist wheel of the

law given in that work. And it is almost unnecessary to point out the resemblance which the highly ornamented Disc No. 7 bears to this sketch. The other discs, though not so elaborately ornamented, seem to adopt the same idea. No. 11, as far as ornamentation is concerned, undoubtedly resembles a wheel, though, as the section will show, it can never have been used, as some of my friends have suggested, as the wheel of a toy cart; nor indeed are there any marks of wear on any of the wheel-shaped discs to support the view that they were used for miniature playthings of this description. It seems much more probable that they were votive offerings intended to represent, more or less the Buddhist wheel of the law, similar to that stamped on some of the coins recently submitted by me to the Society.

The view that these were indeed votive offerings, and not toy cart wheels or *pachísi* or draughtsmen, as some have suggested, is further borne out by the large numbers of clay discs, of a somewhat similar type, but bearing on them the well known Buddhist formula, found in the same neighbourhood. These seals, as they have sometimes been called, from their bearing a seal-like impress, have been figured by Moor in his Hindu Pantheon and have been described by General Cunningham, by Dr. Rajendralála Mitra, C. I. E. and others. General Cunningham, if I remember right, found large quantities of such "seals" made of lac in the Buddhist ruins of Behar. Though my stay at Sankisa was short, I succeeded in obtaining a considerable number of these seals. Many of them are from the same stamp. Others from different moulds bear the same well known formula commencing "*ye dharma hetavo.*" The character of the legend in all these cases is comparatively modern. Those, however, marked 1 and 2 Plate XV bear the formula in the Gupta character. Others again marked 3 to 6 are deserving of notice from the variety of their ornamentation. They would seem all to have been made and stamped, in what I may call, a cushion-like fashion, after the manner of the quaintly-shaped Mitra coins recently submitted by me to the Society. Some of these seals are I think worthy of being figured in the Society's Journal.

There can be little doubt that these so-called seals, bearing the Buddhist formula, are votive offerings. A friend of mine, Mrs. Murray-Aynsley who recently travelled through a portion of Ladakh, brought me thence two stones, one inscribed with a portion of the Buddhist Formula, Plate XV, No. 7, the other bearing a conventional ornamentation. That these stones are offered in the present day, will be seen from the following extract from Mrs. Murray-Aynsley's work entitled "Our Visit to Hindostan, Kashmir and Ladakh," p. 88.

"We there first saw some of the walls called Mánés, which are formed of stones placed one upon the other without any mortar, and are

usually about four feet high, and four feet wide. Some of these walls are as much as a quarter of a mile in length, and are made, we were informed, with the following object. When a Buddhist undertakes a journey, or makes a vow, he chooses a flat stone, takes it to a monastery, and gets a lama (or monk) to engrave some rude characters upon it, which are said to be usually, 'Om mani padme Om,' which has been translated to mean, 'All hail to the jewel in the flower of the lotus!' though some give other interpretations to these words. When his stone is thus prepared, the individual places it on the top of one of these walls, which on their upper surface are almost covered with such engraved stones. Thibetans when passing these walls, always keep them on their right hand, and frequently go out of their direct road in order to do this."

There would seem, then, to be little doubt that the Terra-Cottas, plain and ornamented, and those also bearing the formula of the Buddhist faith, were votive offerings of a by-gone age.

In what little I can do to further the objects of the Society, I generally try to content myself with bringing facts to notice, and pointing out the resemblance between the remains found in India and those discovered in other parts of the world. It must be left to those who are better informed than myself, or who are more fortunate in being able to consult what has been written by authorities on the subject, to determine whether there is any real significance in the resemblance between the remains found at Sankisa and those of Hissarlik and Italy. I am not unprepared for the argument that a knife is a knife all the world over, and that this form of implement must have suggested itself to all people at an early stage of civilisation; and that the fact of implements in the form of knives having been found at Hissarlik and at Sankisa would not be sufficient to establish any connection between the settlers at these widely separated sites. It may also be urged that earthen spindle-whorls might naturally enough suggest themselves to different races situated far apart from one another. But surely there is something more than a chance resemblance in the several types of these remains and the style of their ornamentation? And does not the continual recurrence of, what we call, the Buddhist symbols on the Hissarlik finds, suggest the possibility of Hissarlik and Sankisa having been colonized by branches of the same race, be it Buddhist or not, one of which striking west from some point in Central Asia, found its way to the shores of the Mediterranean, whilst another, taking a southerly course, established itself in the Gangetic valley?

Supplementary Memorandum.

(With a Plate.)

Since writing this Memorandum on spindle-whorls, I have received from Sankisa a further consignment of these peculiar remains.

In my paper recently read before the Society I mentioned that the flat discs, plain and perforated, were to be found in large quantities. I have received a further large consignment. But the perforated ones are much less numerous than the others. It is unnecessary to send any more of these types.

Of what Schliemann calls the volcano-shaped Terra Cottas I have received several more. This bears out my view that they are numerous. Nos. 1 and 2, Plate XV*a*, are interesting from their decoration. The one it will be seen is decorated on the top. The other is decorated on the base with what would seem to be a flower and in a manner resembling the Hissarlik types.

I send also three more balls, Nos. 3-5. These are ornamented with stars, crosses and with lines. Several others of the same type have since reached me.

I have obtained many more clay seals of the same type as those already sent. One only marked No. 6 is different in its character from those already submitted to the Society.

No. 7, is a fragment of pottery highly ornamented with the rosette or wheel of the law, or whatever it may be, common on Buddhist remains.

I should be glad of any explanation of the peculiar piece of soapstone marked No. 8. Its ornamentation is curious. The grooves at the top will be noticed. It may possibly have been worn as an amulet.

Further enquiries are being made at Sankisa, and I hope to be able to obtain many more specimens showing various forms of ornamentation.

It has been suggested that the curious balls of various sizes with their different markings may have been intended to represent the sun, moon and stars.

I see that the genuineness of the antiquities found at Sankisa and Behar is doubted by some. But these sites do not see on an average one European visitor a year; as yet no one save myself has collected there these specimens, and so it is hardly to be supposed that the native mind has yet been sufficiently prepared to attempt to provide forgeries for a possible future trade in such articles.

Note on some copper Buddhist coins.—*By* H. Rivett-Carnac, Esq., C. S., C. I. E., F. S. A.

(With two Plates.)

I send for the inspection of the Society, some coins, mostly Buddhist from my Cabinet, some of which may perhaps prove of interest. They will not all, I think, be found described or figured in the works most readily accessible to Members, and it is possible some of them may be new types. I am indebted to Mr. A Carlleyle of the Archæological Survey for the readings on the coins.

Plate XVI, Nos. 1, 2. Legend *Vaisakha Devasa.* Two coins, if they may so be called, of the same type differing in size. They are evidently *casts, i. e.*, have been made in a mould prior to the time the art of stamping was discovered. On one side is the Bull taking here the place of the Elephant common to the earlier coins. The name tolerably clear above the Bull. On the obverse what looks like the Trisul of the Sanchi Topes, and the snake. I should be glad to know if this coin is known to the Society?

No. 3. Legend *Rája Kamuda Senasa.* This coin resembles the preceding ones in several respects. The Bull again occupies the most prominent place. The legend is beneath the Bull; near the head of the Bull is the sacred tree. Behind the Bull is the snake. At first sight this has the appearance of an elaborate tail of the Bull. But a careful inspection will show that the tail is separate and quite distinct. On the obverse is the well known ornament which I think Fergusson calls the "Trisul," though it is different enough from Shiva's trident. It will be noticed that the marks on these coins have apparently been stamped in the same manner as those of the Mitras, found near Barelli and recently submitted by me to the Society. The Bull and Legend have been stamped in, as if with a square seal, and cover but a portion of the circular piece of metal. Perhaps these coins represent some of the earliest attempts at coining?

No. 4. Legend *Aja Varmma* or *Asha Varmma;* a coin of the same type as above; the legend differing.

No. 5. Legend *Maphaba Varma.* The same remarks apply here also. The coin has been cut in two, and was just going to the melting-pot when I was fortunate enough to rescue the two pieces from a quantity of rubbish. It is to be feared that a good many coins are thus lost to us. All the above were obtained by me at Faizabád.

No. 6. *Maha Satama.* A coin apparently of the same type as above but in bad preservation.

No. 7. *Satya Mitrasa.*

No. 8. *Ayu Mitrasa.*

No. 9. *Saya Mitrasa.*

All of the well known "Cock and Bull" type, but new names I believe.

No. 10. *Yaya Mitra* (two specimens).

Plate XVII No. 11. *Vyaya Mitra.*

These coins seem much older than the preceding ones.

No. 12. (Lion) *Laranga* or *Larata* or *Lâjasa.* (Tree) *Súgáta-Yana-pya.*

This coin is quite a different type from the preceding. On one side is a Lion much resembling the carvings found among the ruins of old Buddhist Temples.

No. 13. A pretty little Buddhist coin of a type I have not yet seen figured. The sacred tree is encircled by the snake forming a sort of rosette in the centre of the coin.

No. 14. These three little oddly-shaped specimens have all well stamped on one side what looks like the conventional Heraldic Lion. On the other side may be traced marks somewhat resembling the sign *Pisces* of the Zodiac.

No. 15. Two specimens of a coin which is perhaps new. On one side what looks like a Fish as in the preceding coins, on the other a Thor's Hammer (?) or perhaps the sign of Saturn combined with some other sign in such a manner as to form a monogram ?

No. 16. Three little coins of sorts.

I should be glad for information regarding the dynasties, dates, &c., of these coins.

JOURNAL

OF THE

ASIATIC SOCIETY OF BENGAL.

Part I.—HISTORY, LITERATURE, &c.

No. IV.—1880.

Remarks on the Afghán found along the Route of the Tal Chotiali Field Force, in the Spring of 1879.—*By* Lieut. R. C. Temple, B. S. C., F. R. G. S., M. R. A. S. &c. (With 3 Plates and 2 Maps).

(*Concluded from page* 107.)

Part II.

III. *Distribution of the Tribes.*

In the above description of the Tribes along the Tal Chótiáli Route their distribution *en route* has been but briefly referred to. In the next Table the names of the tribes inhabiting the villages on the accompanying map are shown. And it will be seen that as a rule the Paṭhán Tribes and Sections stick pretty well together and are generally to be found in certain compact districts and nowhere else.* Thus Achakzais are confined to the region about To'ba and the Kho'ja Amrán range, and the To'r Taríns to the Pishin Valley. Among the Kákar sections the same thing is to be observed. The Amand Khe'l occupy the country about the north of the Pishin to Mt. Kand and the Sulimán Khe'l the range dividing the Pishin and Do'b Valleys, the Mehtarzais all the country to the north of the R. Ro'd Gorge and the Pánízais that to the south of it and so on. Even where the country seems to be pretty well divided between sections, as the Do'b

* Villages of mixed populations are to be found in the more settled parts, such as the Pishin, Do'b, and Gwa'l Valleys, though not commonly, and when it is said that a certain village is occupied by a certain subsection or section it is meant that the main portion of the inhabitants belong to it. As a rule, however, villages are not mixed.

Valley and the Ro'd River Gorge, it is divided only among a few, as only Bázais, Shamozais, Surgarais, Malagais, Isa' Khe'ls and Sara'ngzais amid the surrounding Mehtarzais and Panízais are found in the districts in question. Sayads do not seem to have penetrated into the Kákar country beyond the R. Ro'd, near which there is one village of them, and a few Spín Taríns are said to be about Alízai in the Pishin, but practically there seems to be no communication between the Spín and the To'r Taríns. The Dumars probably occupy all the country to the south of the Sho'r Valley from Mt. Mazhwō to the Tal Valley, but in the Zho'b Valley the tribes seem to be mixed, though the Zho'b Valley Kákars seem to be a section apart and to hang together.

Tribe.	Division.	Section.	Subdivision.	Subsection.	Village.	District.
Dura'ni	Zi'rak	Po'palzai	...	Sadozai	Po'palzai	Pishin.
		Ba'rakzai	...	Mohammadzai	Asad Kha'n	Do.
		,,		,,	Khu'shdil Kha'n	Do.
		Achakzai	Baha'durzai	Ka'kozai	Mi'rkalam Kha'n	Do.
		,,	,,	,,	Ka'kozai	Do.
		,,	,,	Abdal	Kala Abdulla Kha'n	Do.
		,,	,,	,,	Tangai	Do.
		,,	,,	,,	Madat	Do.
		,,	Gajanzai	Habi'bzai	Habi'bulla	Do.
		,,	...	...	Badwa'n	Do.
Tari'n	To'r	Badozai	...	Lu'r Kha'nizai	Mohammad Sa'dik	Do.
	Tari'n	Kha'nizai	...	,,	La'l Mohammad	Do.
		,,		,,	Vaki'l	Do.
		,,	...	Dab Kha'nizai	Dab Kha'nizai	Do.
		Ali'zai	...	...	Gauri	Do.
		,,	...	...	Sayamzai	Do.
		,,	...	...	Ali'zai	Do.
		,,	...	...	Atá Mohammad	Do.
		,,	...	...	Sopánzai	Do.
		Nu'rzai	...	...	Nu'rzai	Do.
		Kulázai	...	...	Skan	Do.

Tari'n	To'r	„	...	...	To'ti	Do.
	Tari'n	Mu'sizai	...	...	Rahamdil Khán	Do.
		„	...	...	Dádgwal	Do.
		„	...	...	No'a Ba'za'r	Do.
		Ma'likya'r	...	...	Ma'likya'r	Do.
		Ma'ezai	...	...	Brija'n Kala	Do.
		Haikalzai	...	...	Haikalzai	Do.
		Manzakai	...	...	Manzakai	Do.
		Ma'likai	...	...	Ma'likai	Do.
		Ha'ru'n	...	...	Sire' Khila	Do.
		„	...	...	She'kha'lzai	Do.
		Kama'lzai	...	...	Kama'lzai	Do.
	Spin	none named	...	...	Shinle'z	Tal and Chotiali.
	Tarín		...	...		
		„	...	...	Tal	Do.
		„	...	...	Cho'tia'li	Do.
		„	...	...	Raha	Do.
		„	...	...	Ko'lu	Do.
		„	...	...	Brahamzai Khêla't	Do.
Ka'kar	Lo'we'	Khwaida'dzai	...	...	Khwai	Zho'b.
	Ka'ka'r	Mursia'ngzai	...	...	Ghundamarai	Do.
		Surgarai	...	...	Hindu' Ba'gh	Do.
		Mehtarzai	...	...	Warghas	Do.
		Mu'sa' Khe'l	...	...	Ba'za'r	Do.
		Ba'rakzai	...	...	Barsho'r	Mt. Kand
		none named	...	...	Ghurat	Zho'b.
	Kuchnai	Sulima'n Khe'l	...	Tragarai	Sharan	Do'f.
	Ka'kar	„	...	„	Narín	Do.
		„	...	„	Murghai	Do.
		Amand Khe'l	...	...	Ha'jí Kha'n	Pishin.
Ka'kar		„	...	...	Ka'mil Kha'n	To'ba.
		Mehtarzai	...	...	Khunchagai	Mt. Kand

Tribe.	Division.	Section.	Subdivision.	Subsection.	Village.	District
Ka'kar		Mehtarzai	...	...	Mehtarzai	Do.
		,,	...	...	Bargai	Do'r.
		,,	...	...	Tlarai	Do.
		,,	...	...	Sadoh	Do.
		,,	...	...	Ja'pir Got	Gwa'l.
		,,	...	...	Sraghar	Ro'd R. Gorge.
		,,	...	...		
		,,	...	...	Zagan Kach	Do.
		Pa'nizai	...	Adizai	Amadu'n	Mt. Pil.
		,,	...	,,	Go'gai	Do.
		,,	...	,,	Ro'dgai	Do
		,,	...	no subsection named	Shama'wan	Do'r.
		,,	...	...	Sa'ghai	Do.
		,,	...	...	Balozai Ka're'z	Do.
		,,	...	...	Kha'nizai Ka're'z	Do.
		,,	...	...	Shakar	Do.
		,,	...	...	Gwa'l	Gwa'l.
		,,	...	...	Manzakai	Do.
		,,	...	...	Chauku'l	Do.
		,,	...	...	Bo'sta'n	Do.
		,,	...	...	Waría Kach	Ro'd R. Gorge.
		,,	...	...		
		,,	...	...	Brahima'n	Mt. Pil.
		Ba'zai	...	...	Murghai	Do'r.
		,,	...	...	Dilsho'r	Do.
		,,	...	...	Safkha'n Ka're'z	Gwa'l.
		,,	...	...	Nílai	Do.
		,,	...	...	Karam	Do.
		,,	...	...	Akhundza'da Go't	Do.
		,,	...	...	Ko'sh Kach	Ro'd R. Gorge.

Ka'kar	"	...	...	Ta'zí Kach	Do.
	Shamozai	...	...	Lu'r Anga'ng	Do'r.
	"	...	...	Ku'z Anga'ng	Do.
	"	...	...	Me'kha'n	Do.
	"	...	...	Wochakhila	Do.
	"	...		Isa'r Kach	Do.
	"	...	...	Wargai	Do.
	"	...	...	Shudand	Do.
	Surgarai	...	...	Khu'shla'k	Khúshlák
	Malagai	...	...	Shna'khorai	Ro'd R. Gorge.
	"	...		Kudín	Do.
	Isa' Khe'l	...	...	Tlarai	Do'r.
	"	...	...	Ka'han	Do.
	"	...	...	Ksho'i Ka're'z	Do.
	"	...	...	Wulgai	Gwa'l.
	"	...	...	Kha'nai	Do.
	Sara'ngzai	...	Mula'zai	Mula'zai	Ro'd R. Gorge.
	"	...	Ta'ra'n	Kudín	Do.
	"	...	...	Adak Tangai	Do.
	"	...	no subsection named	Zarghu'n Ka're'z	Do'r.
	"	...	...	Mohammad Sharíf	Do.
	"	...	...	Mo'sai	Do.
	"	...	...	Snaga'l	Ro'd R. Gorge.
	"	...	...	Sara'ngzai	Do.
	"	...	...	Spe'zhandai	Mt. Spinskhar.
	"	...	...		
	"	...	...	Zarghai	Do.
	Zakhpe'l	...	Amakai	Kach	Sho'r.
	"		Kanozai	Kwo'i	She'rín.
	"	...	...	She'rín	Do.

Tribe.	Division.	Section.	Subdivision.	Subsection.	Village.	District.
Ka'kar		Zakhpe'l	...	No'azai	Baia'nai	Ghazgai
		,,	...	...	Ghírkhwa'	Do.
		,,	...	no subsection named	Gurmai	Sho'r.
		,,	...	...	Kurbí	Do.
		,,	...	...	Sa'la'zh	Do.
		,,	...	...	Chimja'n	Do.
		,,	...	...	Dargai	Do.
		,,	...	...	China'li	Do.
		Dumar	...	...	Ra'dingzai	Mt. Spinskhar.
		,,	...	...		
		,,	...	...	O'bushtkai	Sho'r.
		,,	...	...	Sinzawai	Smalan.
		,,	...	...	Smalan	Do.
		,,	...	...	Shaka're'z	Do.
		,,	...	...	Bagha'wa	Do.
		Utma'n Khe'l	...	...	Ninga'nd	Ghazgai.
		,,	...	...	Alam Ba'gh	Do.
		,,	...	...	Numa'ra'	Do.
		,,	...	...	Sarkai Zangal	Do.
		,,	...	...	Ghurat	Zho'b.
		,,	...	...	Bakhma'	Bo'rai.
		,,	...	...	Sagar	Do.
		,,	...	...	Lashtai	Do.
		,,	...	...	Jalka're'z	Do.
		,,	...	...	Shaka're'z	Do.
		,,	...	...	Ro'dli'n	Do.
		,,	...	...	Arbasi'n	Do.
		,,	...	...	Ko't	Do.
		Sandar Khe'l	...	Ali'zai	Waria'gai	Do.
		,,	...	...	Khankai	Do.
		,,	...	...	Zangiwa'l	Do.

Ka'kar	Sandar Khe'l	...	Dargai	Dargai	Do.
	,,	...	Shabozai	Shabozai	Do.
	,,	...	Mu'r	Lo'we' Mu'r	Do.
	,,	...	...	Kuchnai Mu'r	Do.
	,,	...	Waha'r	Kaun Waha'r	Do.
	,,	..	,,	Lo Waha'r	Do.
	,,	...	,,	Navgivya'la	Do.
	,,	...	no subsection named	Di'lai	Do.
	,,	...	,,	Kuzarai	Do.
	,,	...	,,	Tugarai	Do.
	,,	...	,,	Ko'wandai	Do.
	,,	...	,,	Sarka're'z	Do.
	,,	...	,,	Chi'nai	Do.
	,,	...	,,	Sarghara'i	Do.
	,,	...	,,	Da'lo,r	Do.
	,,	...	,,	Kachai	Do.
	,,	...	,,	Kana'	Do.
	,,	...	,,	To'ra	Do.
	,,	...	,,	Cha'gai	Do.
	,,	...	,,	Navgivya'la	Do.
	,,	...	,,	Mu'ltat	Do.
	,,	...	,,	La'ho'r	Do.
	,,	...	,,	Sa'gai	Do.
	,,	...	,,	Sharan	Do.
	,,	...	,,	Sha'ba'n	Do.
	,,	...	,,	Sharan Ka're'z	Do.
	,,	...	,,	Kach	Do.
	,,	...	,,	Sarghar	Do.
	,,	...	,,	Barminai	Do.
	,,	...	,,	China' Ko't	Do.
	,,	...	,,	Naigwa'l	Do.
Lu'ni Khe'l	no sections named	...	...	Paind Kha'n Ko't	Lu'ni.

Tribe.	Division.	Section.	Subdivision.	Subsection.	Village.	District.
	Lu'ni					
	Khe'l	none named	...	...	Lashkar Kha'n	Do.
		,,	...	...	Lu'ni	Do.
		,,	...	...	Nu'r Kha'n	Do.
		,,	...	...	Alab	Do.
		,,	...	...	Shaugwa'l	Do.
		,,	...	...	Soba't	Do.
		,,	...	...	Chi'nai	Do.
		,,	...	...	Misri'	Do.
		,,	...	...	Samandar Kha'n	Do.
		,,	...	...	Sara'gi'	Do.
?	Sayad	Karbe'la	...	..	Karbe'lai	Pishin.
		Sayad	...	Gangalzai	Sha'h Da'd	Do.
		,,	...	Bagarzai	Sayad Paiyo	Do.
		,,	...	,,	Sayad Alab	Do.
		,,	...	Ajabzai	Ajabzai	Do.
		,,	...	Sha'di'zai	Sha'di'zai	Do.
		,,	...	Brahamzai	Sayad La'l	Do.
		,,	...	,,	Sayad Khama'ndai	Do.
		,,	...	,,	Sayad Do'st Moham-mad	Do.
		,,	...	,,		
		,,	...	Haidarzai	Haidarzai	Do.
		,,	...	Ya'singzai	Sayad To'ti	Do.
		,,	..	,,	Sayad She'rbat	Do.
		,,	...	Urumzai	Sayad Sa'lo	Do.
		,,	...	no subsection named	Sayad Mu lla Alla'h-dad	Do.
		,,	...	,,	Sayad Paind	Do.
		,,	...	,,	Haji'zi'	Do.
		,,	...	,,	Turkhe'l	Do.
		,,	...	,,	Shaghi'n	Ro'd R. Gorge.
		,,	...	,,		

IV. *Polity.*

The portion of Afghánistán along the route may be divided into that formerly subject to the Amír of Kábul, and that acknowledging no superior authority, into, in fact, the Amír's Territory and the country of Independent Tribes. The Amír's power never seems to have extended beyond the Do'r Valley to the eastwards further than Isar Kach, or further north in that direction than Mt. Kand, *i. e.*, the inhabitants of the Zho'b Valley and all the country south of it eastwards of the Do'r Valley have never recognised him as their ruler. The tribes then under the Amír's sway were the Durá-nis, the Tór Tarins and such Kákars as inhabited the Do'r and Gwál Valleys, while the bulk of the Kákars, the Lúnis, the Zarkháns and the Spín Tarins have always been independent. For the purposes of this paper the country will be divided into Amír's Territory and Ya'ghista'n or Independent Territory.

Under the Amír, Government in our sense of the term there was none, though the head of the Government nominally ruled through his Sirdárs or heads of tribes and sections, having, however, little real control over them. And how this system was worked has been thus described.* "The Sovereign is absolute and makes any and every change which may appear to him necessary or proper in the government and administration. He can dispose of the lives and property of his subjects and is kept within certain bounds in these respects only by the calculations which prudence dictates. Religion is the counterpoise to his authority. This gives the clergy great influence, one that he might try in vain to subject to his will and pleasure, and vainer still would be the attempt to infringe and invade the rights and privileges of the sirdárs or chiefs of tribes, who would never consent to resign a certain influence in the affairs of government. It may be said in Afghánistán that there are as many sovereigns as sirdárs, for each of them governs after his own fashion. They are jealous, turbulent and ambitious, and the sovereign can restrain and keep them in some order only by taking advantage of their rivalry and feuds and opposing one to the other. There is no unity, nothing is permanent, everything depends on the pleasure or caprice of a number of despots always at variance with each other and mak-ing their tribes espouse their personal quarrels. A constant feeling of irascibility is the result which finally leads to sanguinary civil wars and throws the country into a state of anarchy and perpetual confusion. The sirdárs are at one and the same time the strength and the curse of the monarch. Prompt to take arms and defend him when a good understand-ing between them exists, they are as ready to revolt against him when they find or think they have the smallest interest in doing so. In anything,

* Macgregor's Gazetteer.

however, to which they are disinclined, they would not obey even the sovereign of their choice but with reluctance; moreover they are always impatient to see him replaced by another from whom they hope to obtain greater advantages. Each subdivision of a tribe is, according to its numerical force and extent of territory, commanded by one or more sirdárs. These chiefs may be compared to the dukes and barons of the middle ages in France, the more powerful to the knights bannerets, and those having authority over only a few families to the esquires who in time of war enrol themselves and their men under the orders of the chief that inspires them with the greatest confidence and can pay them best.* The most powerful amongst them are caressed by the sovereign who attaches them to his interests much more by the concessions he makes than by the fear he inspires. Ordinarily and with a view to preserve a nominal authority over them, he remits the whole of the taxes and imposes in their stead the obligation to furnish a contingent of troops in the event of war being declared against him by his neighbours. This wretched system gives too much power to the Sirdárs. The sovereign is at their mercy, and it is the ambition of these men that gives birth to the numerous civil wars in Afghánistán; for they are constantly in revolt."

Such being the state of civil government in the Amír's Territory, the only difference to be observed in the Independent Territory is, that the local Sirdár, or whatever other local chief happens at the time to be the most powerful, is absolutely uncontrolled even by the semblance of superior power. The above-mentioned independence of the Sirdárs and their impatience of superior control is to be observed in numerous instances even in the Kháns or rulers of villages, being of course more pronounced in Ya'ghista'n than in the Pishin and other portions of the Amír's Territory. To give an example. In the Pishin the ruins of a village called Sayad Sa'lo or Urumzai were passed. It had been but recently destroyed by a more powerful neighbouring village called Sayad Paind in a quarrel between the two Kháns. The Urumzais had to fly altogether out of Afghán Territory across the Belo'ch Border to Khu'shla'k where they settled. They appear to have been hunted across the Border by the other village without any attempt at interference on the part of the neighbours. Again not far from this last were two villages, Old and New Ma'likya'r, the old village having been deserted on account of an internal dispute and a new site selected a few miles off. The same thing was to be observed at a place called Waria'gai in the Bo'rai valley, where an evidently lately ruined village called Old Waria'gai was passed. I was informed it had become so about five years before on account of an internal squabble. Like the

* The very remarkable parallel to be observed politically between the Afgháns and the Mainotes of Greece I have elsewhere pointed out. J. U. S. I. of India, 1880.

Barons of European feudal times these village Kháns seem to exercise the right of private war on their neighbours without control or interference. Certain villages have acquired an evil name for this kind of truculence. KACH in the SHO'R valley is such a village. Nor is a fight or quarrel always a necessary reason for a change of site, any caprice or change of owners is sufficient. A case in point is the fort of HA'JÍ KHA'N (AMAND KHE'L) in the Pishin. And towards the Border by the HAN Pass, in the long stretch of disputed land about the passes, ruined villages are naturally to be seen in the more exposed parts of the LU'NI KHE'L, ZARKHA'N and SPÍN TARÍN country on the Afghán side and in BA'RKHO'M on the Beloch side, the result of endless border raids. The lawlessness of the GHILZAIS along the roads between Kandahár and Kábul has been noticed by former travellers, one of whom has written:* "Every man distrusts his neighbour or is at open feud with him. It is the custom of the country to throw a heap of stones over murdered travellers, and in the ravine leading from SHILGAR to ZURMAT (Ghilzai country) the frequency of these heaps is sickening. In many cases they are to be found at the closed end of the ravines showing how the poor travellers have run as far as possible and then been cut down." The same may be remarked of almost any part of the Kákar country, and in that portion about Mts. MA'ZHWÖ and SPINSKHAR where the heights are crossed between the USH and NANGALU'NA Passes, there is a long narrow valley between low hills to be crossed, and in this it is hardly any exaggeration to say that these heaps may be seen but a few yards apart. The reason appears to be that persons going from the SHO'R and BO'RAI Valleys or the DUMAR country from the south towards the Pishin must pass this way through a country which is for some thirty miles utterly uninhabited. In the wild uninhabited border tract about the HAN, HANOKAI and TRÍKH KURAM passes they may be seen in clusters in many places telling of some fights either among the local tribes themselves or with the Belóchis.

The mutual distrust among the tribes and even sections inhabiting different districts is so great as to result in an almost absolute ignorance of each other. They appear to have a real fear of going into each other's country and invariably give one another a bad character. Thus KA'KARS are an abomination to TARÍNS and ACHAKZAIS and LU'NIS to KA'KARS, while the wretched ZARKHA'N is harried on all sides. The ÍSA' KHE'L Kákars and the inhabitants of the GWA'L valley manifested an extraordinary fear of the PA'NÍZAI Kákars of the hills to the east of them. SANDAR KHE'L Kákars could not be induced to venture into the neighbouring LUNÍ territory and I did not personally meet a man who had been towards GHAZNI by the TO'BA Plateau or along the Tal Chótiáli Route. A guide

* Macgregor's Gazetteer.

from the Do'f Balley an Isa' Khe'l, showed the liveliest anxiety to get back again from Ispira Ra'gha and would not venture into the Zakhpe'l Territory and an old Utma'n Khe'l guide told me he had never ventured beyond the territories of his section of the Kákars.

The structure of the houses in the more civilized parts, which in the hills consist of nothing more than rough mud and thatch, is a further proof of the general lawlessness of the population. In the Ghazgai, Bo'rai and Lu'ni Valleys, among the Utma'n, Sandar and Lu'ni Khe'ls a house is nothing less than a fort round which, frequently within walls, is the cultivation necessary to support life, and when the crops are gathered they are stored in little round mud towers which I have shown elsewhere to contain just enough grain for one family for a year. In the Do'f Valley, however, I only saw one fort in a village called Kha'nizai Ka're'z and in the Pishin the villages were all open. Life in the Pishin among the Tarins and Sayads seems to have been much more settled than elsewhere, but the Achakzais have a bad name as thieves and robbers.

Government among the Durânis differs considerably from that of the other tribes, noticeable chiefly in its regularity and order. Each section of the Durânis is governed by a sirdár and each subsection by a Malik or Mushir. The principle is election qualified by hereditary claims, *i. e.*, the sirdár is elected from the chief family of the clan or section, and the malik from the chief family of the subsection. The sirdár has a deputy or naib always a near relative appointed by himself. Their occupation of the land is directly from the Amír on the condition of military service. Among themselves the Durânis do not as a rule resort to private revenge, hence internal blood-feuds do not exist among them as among other tribes. Their disputes are settled by the "Jirga" backed up by the sirdár, by the interposition of the elders, by friends of the parties, by the priests (Mullas), or by the civil and ecclesiastical judges (Ka'zi's). The Achakzais, the section of the Durânis met with en route, are the wildest of those inhabiting South Afghánistán and are entirely a nomad race, hardly ever living in a house. They inhabit the To'ba Plateau and during the summer roam over it with their flocks and spread themselves over the lower slopes of the Kho'ja Amra'n Range about the Kadanei and Pishin Valleys during the winter, where their black tents or Kizhdais are to be seen everywhere. Their Sirdár is at present Mír Aslam Kha'n, son of Mír Abdulla Kha'n who built the well known fort or village of that name at the Pishin entrance of the Kho'jak Pass.

The Kákars and Independent Paṭháns do not apparently recognise any particular sirdár or chief, and probably any man rules who has the requisite force of character, though birth, on which an Afghán always sets such an extravagant value, is pretty sure to exercise considerable weight in

the selection of a ruler. Thus SAMANDAR KHA'N of the LU'NIS, now their leader, is the son or near relative of PAIND KHA'N their late ruler. SHA'H JEHA'N of KHASNO'B (ZHO'B valley) is a great man among the Kákars and GWARAT KHA'N among the SANDAR KHE'L.

V. *Civilization.*

As regards civilization, except as to dress, methods of cultivation and dwellings, but little could be observed in such a hurried journey as mine.

On the first point there is little to be noticed beyond what has been already written about it by the authors of the following:* "The Afgháns wear their clothes long. They consist of two large very ample robes and are either of cotton or a cloth made of camel's hair† called BAREK: this is the dress of the people. The only difference in the garments of the rich is the material, which is silk, cloth or Kashmír. In summer they are made without lining, but in winter they are wadded with cotton or lined with fur. The under-garment is confined by a piece of muslin or long-cloth which is wound round the body. The outside one, and sometimes a third robe, is used as a cloak, and a person would be considered as wanting in politeness if on visiting a superior he did not put it on. The shirt is very full and the sleeves which reach below the hands particularly so.‡ The former is open to the sides from the neck to the waist and falls over the trousers, and these which are excessively large, open at the foot and are drawn in at the waist with a string. The head is covered by an enormous blue or white turban and the feet with slippers without quarters. The upper classes are for the most part simply dressed and consider luxury in this respect as enervating, but some young chiefs have their robes embroidered with gold thread and ornamented with gold lace. This is done in the harems by the women who excel in this kind of work, particularly in Kandahár. The Afgháns are not careful of their clothes and soil them the very first day they are put on, for they squat on the ground without taking the least thought whether the spot on which they sit is clean or dirty. They never change their garments, not even the shirt, until they are completely worn out, and as they rarely wash themselves they are constantly covered with vermin great and small."

In the matter of dress excepting the Achakzais, the Duránis show as usual a considerable superiority over the other tribes. The following was found to be a fairly true description of their dress.§ "The Duránis about

* Macgregor's Gazetteer.

† A thick white material like felt for the outer cloak is common about Kandahár and the Pishin, and to this is often added a "póshtín" or coat of skin with the hair turned inwards.

‡ The cloaks about Kandahár and all over the South have frequently long false sleeves reaching nearly to the ground.

§ Macgregor's Gazetteer.

towns, most of those in villages and all those of the shepherds who are in easy circumstances wear a dress nearly resembling that of Persia, which though not very convenient is remarkably decorous and with the addition of a beard gives an appearance of gravity and respectability to the lowest of the common people. The poorer Duránis, particularly among the shepherds, wear a wide skirt and mantle. The poor only change their clothes on Fridays and often only every other Friday, but they bathe once a week at least, and their prayers require them to wash their faces, beards and hands and arms many times in the course of the day. The little Kháns all over the country wear the Persian dress. Their coats are made of silk, satin, and a mixture of silk and cotton called GARMSUT, and sometimes of brocade, and they all wear shawl girdles and a shawl round their caps. Their cloaks also are of broadcloth often red or of silk of different colours." To the Achakzais the above remarks hardly apply except in a very general way. Their manner of dress is the same, but they seldom or never change their clothes as long as they last, and consequently go about in filthy rags often half tumbling off them. They are in dress as in everything else the most uncouth and uncivilized of the great clan to which they belong.

With regard to the Sayads, Tarins and Kákars, etc. met with en route there is little to be remarked except that they all wore the unmistakeable Afghán dress. In the more civilized valleys as the Pishin, Dóf, Gwál, Ghazgai and the Bórai the dress was better and more respectable answering to the above given description of the Durání dress.* But in the hill districts especially in the elevated region about Mt. MÁZHWÖ the dress merely appeared to be a collection of dirty rags, the remains of what was originally the national costume. The PÁNÍZAIS, MEHTARZAIS, SARÁNGZAIS, AMAND and SULIMÁN KHE'LS, DUMARS and ZAKHPE'LS among the Kákars bear off the palm for dirt and squalor. The ÍSÁ, UTMÁN and SANDAR KHE'LS are much cleaner and neater in appearance and altogether better dressed. The LU'NIS and ZARKHÁNS met with wore the dirtier and more ragged class of dress, but with the exception of the SANDAR KHE'L Kákars the Pishin Sayads were the best-dressed people I recollect to have seen on the road.

The dwellings were found to differ considerably in different parts of the route. Those about the Pishin and Dóf valleys were apparently constructed on the same principles, whether Sayad, Tarín, Achakzai or Kákar. Tribe indeed does not apparently affect the construction of dwellings so much as locality.

The most noticeable construction of hut is that to be found every-

* Among the Sayads it was to be observed that the articles of dress were not homespun but of foreign manufacture, obtained probably during their many visits to Hindustán.

where to the west of the Khoʻja Amrán Range. These are square dwellings of mud (kachchá) bricks about 20 feet by 12 feet and some 6 to 8 feet high surmounted by one or more small domes. In this method of construction wood is not required for the roof, a great consideration in a treeless country like South Afghánistan (*vide* fig. 1). But the hut of the Pishin Valley and neighbourhood has a sloped roof (fig. 2) supported on strong rafters, thatched and finally covered with mud. This roof is by far the most valuable part of the structure, and during their numerous migrations they carry away the wood-work to be set up in the new site. The usual measurements of such a hut are roughly: length 18 feet, breadth 6 feet, height of wall 6 feet and of roof 10 feet. They have no windows but usually three small holes at either end for air and smoke. A hut generally stands in a small yard surrounded by a rough stone or mud wall and sometimes there are two or three huts in the same enclosure.

As the mountainous regions between the Pishin and Shor Valleys are approached, the huts become much rougher though constructed on the same principles. They are irregular structures of mud over foundation walls of large unhewn and uncemented stones from the nearest stream or hill-side, and frequently also the back wall is the hill-side itself. The roof as before is of thatch covered with mud. There is also often a small window hole and the door frequently stands out from the roof on the principle of a dormer window (fig. 5). The general dimensions are height 10 to 12 feet, height of rough stone-work 3 feet, of mud wall 1 to 2 feet, length 10 to 12 feet.

Up in the mountains and in the upper gorge of the R. Roʻd the dwellings degenerate into a mere irregular thatch of leaves and brushwood of a pyramidal or conical form supported by a centre pole and having a door or entrance at one side. Frequently a hole is scooped out from the hill-side and thatched in, so as to form a rough kind of hut or dwelling. These conical huts measure generally: height 10 feet, diameter at base 10 feet (*vide* fig. 4).

On reaching the lower lands about Oʻbushtkai, Kuwára and Chimján, a hut very similar in appearance to that of the lower Roʻd Gorge is to be seen, the roof of which is irregular and of thatch covered with mud and supported on irregular rough stone walls cemented, so to speak, with mud. There is usually no gap for a window (*vide* fig. 8). The measurements are: length about 12 feet, height of wall 3 feet, total height 8 feet.

In the mountainous tract between the Shoʻr and Zhoʻb valleys the huts are very wretched and have the appearance of being of a temporary character. The floor is scooped out of the ground on the hill-side so as to save a back-wall, and a wall about 3 feet high is built up on three sides

surmounted by the usual mud-and-thatch roof. The interior height is about 6 feet and the length some 10 or 12 feet, breadth 6 feet.

But on reaching the GHAZGAI and BO'RAI Valleys, *i. e.*, the territories of the UTMÁN and SANDAR KHE'L Kákars, a notable difference in dwelling structure is observable. The houses, rather than huts, now to be seen are of mud, as in Belochistán, Sind and the Panjáb.* In the GHAZGAI Valley they are all fortified after the fashion of these people, having frequently a look-out tower, which is sometimes square but generally circular, attached to them. The body of the building has the sloped thatch-and-mud roof of the Pishin valley. The entrances or doors are very low, being only 3 feet or so in height; the tower has also a separate entrance of a similar construction, and round the top of it is a row of loop-holes. The usual dimensions are: height of wall 4 feet, of hut 8 feet, of tower 12 feet, base of tower 6 feet square (diameter, if round, 6 feet), length of hut 16 feet (*vide* fig. 9).

In the BO'RAI and LU'NI Valleys were the best dwellings (figs. 10, 11, 13) I saw outside Kandahár in all S. Afghánistán, and I can hardly do better regarding them than repeat what I have elsewhere said.† "They are no longer huts, but have become houses with dimensions varying considerably; fig. 10 represents one of the smaller ones. They are built entirely of mud with flat roofs from which the water is carried by projecting spouts. They are generally fortified and have towers attached and usually only one door. Fig. 11 represents one of these fortified houses. The bulk of the houses, however, in the BO'RAI Valley are much larger than those above mentioned, and may be described as fortified structures of mud, surrounded by a mud wall some 12 feet high and covering sometimes nearly an acre of ground (*vide* fig. 13). They have usually several towers attached and one door; within the outer wall are a quantity of fruit trees, and the house probably contains a whole family. Generally also there is a low 3 foot mud wall extending round the fields belonging to the house probably for their protection. Three or four such houses often constitute a village. The fortifications of an UTMÁN KHE'L village are often supplemented by a small regular square mud fort or redoubt with corner towers. Forts of a similar description are also to be observed about the SANDAR KHE'L and LU'NI Territory, where the villages are generally a straggling collection of

* In the Panjáb the walls of such a house (kachchá makán) are built simply of wet mud (góndhá) without foundation (bunyád), then smoothed over with liquid mud (kaigal) and finally covered with a wash of cowdung and mud (góbrí) and often also with whitewash (sufédí) or a coloured lime-wash (rang). The roof (chhat) is of rafters (kharí) covered with a light reed thatch (sirkí), plastered over with mud or earth (miṭṭhí) and cowdung (góbrí).

† J. R. G. S., 1880.

the large fortified houses above described. They have a well-built, substantial and prosperous appearance not often seen in the East. Sometimes a MALIK or petty chief will build himself a fort apparently as much for show as anything else. CHINÁ KO'T in the BO'RAI valley (fig. 14) is such a fort. The main interest in it is that it is quite new, not more than 20 years old, and so is a specimen of the modern method of Kákar fortification. It is on a small isolated hillock rising out of the valley, and is constructed as usual of mud on a rough stone foundation. The owner is one MALIK SANDÍ, an ÁLÍZAI SANDAR KHE'L. The approach is by a causeway of very rough construction, and it is entered as usual by a single door so situated as to be easily commanded. The whole structure covers about an acre of ground".

The nomadic habits of the Duránis and especially of the Achakzai section of that tribe have been frequently noticed by former writers. Among the Kákars, too, are found several nomad sections, such as the SULIMÁN and AMAND KHE'LS of the Pishin and the bulk of the PÁNIZAIS, DUMARS, and ZAKHPE'LS; even the more fixed and agricultural sections of the Kákars, as the SANDAR and UTMÁN KHE'LS, and the LU'NIS have the nomadic instinct strong in them and spend all the hotter weather roaming with their flocks in the neighbouring hills. By far the greater part of the ACHAKZAIS have no fixed abode, but live in a curious kind of hut called a KIZHDAI, which has been thought peculiar to the Duránis, but as far as I could ascertain, it is common to all the nomad sections whether DURÁNI or KÁKAR. The KIZHDAI is a structure of bent willow rods or withies covered over with black felt-like blankets and sometimes with black matting (*vide* fig. 3). There are generally four or five of these willow supports in a row over which the covering is stretched. I saw one in the course of construction near ÁLÍZAI in the Pishin and the method of putting up the supports is that shown in fig. 15. The Kizhdais are very warm in winter and can be made, by opening out the sides, cool and pleasant in summer, and are also, from the closeness of the strands of the covering which swell with moisture, impervious to rain. They have for a nomad race the advantage of being as easily moved as an ordinary tent. In several Kizhdais of a permanent kind near villages I saw a regularly railed in space in the middle for goats and sheep. The usual dimensions are: height 4 feet, length 12 feet, opening or doorway 3 feet by 3 feet.

There are two other kinds of structure which are interesting in this connection. In the BO'RAI valley the SANDAR KHE'LS build small circular mud towers of peculiar make (*vide* fig. 12), raised on piles about 2 feet from the ground, in which they store grain containing as I have elsewhere shown* about enough for five persons for one year. BHUSA (chaff or chop-

* J. R. G. S., 1880.

ped straw for fodder) is kept in round mud-covered heaps containing about 100 to 200 maunds, as are turnips etc. in England for the winter. Grain of all sorts is also stored in sacks weighing about 100 seers, which are kept in the huts and sometimes buried in some place known only to the owner to save them from the rapacity of the numerous hangers-on of the Sirdárs or of the Amír.

Secondly, Ásyás or watermills are noticeable objects everywhere. Their general features have been frequently before described, as they are common to Afghánistán, Persia and Turkistán, and the following from MacGregor will answer the internal description of them all: "The wheel is horizontal and the feathers are disposed obliquely so as to resemble the wheel of a smoke-jack. It is within the mill and immediately below the mill-stone, which turns on the same spindle with the wheel. The water is introduced into the mill by a trough so as to fall on the wheel. The wheel itself is not more than 4 feet in diameter."* Externally they have always the appearance of the ordinary habitations round them, whatever the prevailing construction may be. They are to be found along the line of a Ku'l or of a natural running stream, and often, to give the water greater power, a portion of the stream will be banked up for some distance before it reaches the mill (fig. 4). The roof is usually on a level with the banks of the stream. In places, as at Álízai in the Pishín, long lines of Ásyás and embankments are to be seen along the same stream (fig. 17).

There is little to be remarked under the head of cultivation beyond a notice of such methods of irrigation, etc., as came prominently under observation, for my journey was of too hurried a nature to admit of any investigation. In irrigation considerable skill is everywhere evinced in S. Afghánistán, especially in the direction of Ku'ls or artificial water-courses, of Kárez'es or underground water-courses, and of groins and river dams. Wells are not seemingly in use for cultivation as in the Panjáb and Persia. The Ku'l is well-known in all the northern districts of India and there is little to be added here, except to notice the general prevalence of this style of irrigation in S. Afghánistán, where along the Tarnak Valley it is used to such an extent as to dry up and disperse the water of the river: a state of things also noticeable along the rivers running towards the Indus and the Kachí Plain of Belúchistán. The entire flow of many mountain streams is frequently thus utilised, and great skill is often to be observed in the preservation of the levels; and in one place in the Bo'rai Valley I observed a Ku'l carried under the stony bed of the R. To'r Khaize' by a rough but practicable syphon.

* Such watermills are common enough in the Himalayan districts, and I have in my possession a wooden bowl turned by a lathe worked by a water-wheel in a remote valley in Ku'lu'.

The KÁRE'Z has been frequently noticed by travellers in Central Asia beginning with Marco Polo, who, according to Ramusio's version, writes about "the wearisome and desert road in KERMÁN (KIRMÁN)", that* "after those days of desert you arrive at a stream of fresh water running underground, but along which there are holes broken in here and there, perhaps undermined by the stream, at which you can get sight of it. It has an abundant supply and travellers worn with the hardships of the desert here rest and refresh themselves and their hearts." Col. Yule remarks on this (p. 116) "the underground stream was probably a subterraneous canal (called KANÁT and KÁRE'Z) such as is common in Persia, often conducted from a great distance. Here it may have been a relic of abandoned cultivation". Khanikoff on the road between KIRMÁN and YEZD, not far west of that which I suppose Marco to be travelling, says: "At the fifteen inhabited spots marked on the map they have water which has been brought from a great distance and at considerable cost by means of subterraneous galleries to which you descend by large and deep wells. Although the water flows at some depth its course is marked upon the surface by a line of more abundant vegetation." Elphinstone says he has heard of such subterranean conduits 36 miles in length." MacGregor describes the construction of a KÁRE'Z thus: "a shaft 5 or 6 feet in depth is sunk at the spot where the stream is to issue on the surface, and at regular intervals of from 20 to 50 or more paces in the direction of the hill, whence it has been previously ascertained that a supply of water will be obtained, other shafts are sunk and the bottoms of all connected together by slightly sloping tunnels. The depth of the shafts increases with their distance from the original according to the slope of the ground. Their number and the length of the KA'RE'Z depends on the supply of water met with, the quantity required and the distance of the habitable or cultivable spot. The position of the shafts is marked by circular heaps of earth on the surface and their orifices are usually closed, the covering being removed at intervals of a year or more for the purpose of cleaning and repairing the shafts and tunnels. Much experience is required to select a spot from which a plentiful and lasting supply will be obtained. Some KÁRE'ZES afford a constant supply of water for ages whilst others become exhausted before they have paid for the cost of construction." To this I may add the advantage of the KÁRE'Z is the prevention of the rapid evaporation the water would undergo in such a climate if freely exposed to the air. KÁRE'ZES are frequently very deep, 40 feet and more below the surface. Judging from one seen under construction in the Pishin, the shafts or wells are sunk as usual with pick and shovel and with crate and windlass, and the water-passage tunnelled out afterwards. One cause of the per-

* Yule's Marco Polo I, 115.

manent drying up of KÁREZES is the shifting of the subterraneous water lodgment, and it is not uncommon to see parallel lines of KÁRE'Z wells close to each other. KÁRE'Z digging is a special occupation, the GHILZAIS being famous for it.

The system of irrigation by tanks or open reservoirs so successfully used in MAISU'R and many parts of the Madras Presidency is only sparingly used in Afghánistán, and I only observed a few small irrigation tanks in the Pishin and KADANEI Valleys, though from the universal presence of uneven country in Afghánistán it would appear that the MAISU'R system of *bands* and tanks should succeed as a means of irrigation if regularly introduced.

The method of irrigation by means of groins and reclamation of river-beds to be observed in the high lands along the valley of the R. RO'D and in the SHO'R Valley in the neighbourhood of CHIMJÁN is very remarkable. These groins are constructed at a great cost of labour with rough stones and tree trunks and are frequently turfed over and planted with willows and small bushes. In the RO'D Gorge the main portion of the cultivable land has been obtained in this way.

There is one more point to be noticed in this connection. Elphinstone states (Kingdom of Kábul) that it seems to be only in the very poorest parts of the country that land is allowed to lie fallow for a year. This, however, is apparently not the case in the Kákar Country generally, especially in the BO'RAI Valley, where the large area under cultivation is only to be accounted for by a large portion of it being allowed to lie fallow every year.

Madder, which, as MacGregor observes, is common in the west of Afghánistán and sold all over India by Paṭháns as MAJÍT or MANJÍT, is to be found in the DO'F Valley in highly cultivated lands deeply furroughed and manured. The leaves are used for cattle and the roots for the dye. This cultivation is elaborate, good and costly, and the yield in the DO'F Valley is said to be worth Rs. 1000. The people there believe apparently that it is not grown elsewhere; it is, however, to be seen about TAKHT-I-PU'L near Kandahár.

Graveyards deserve mention in this place. These are to be found scattered over the land in places quite remote from population. In fact the dead are frequently carried to long distances from their place of decease in order to be buried at a particular spot. This system of carrying the dead to certain places belonging to the family is prevalent among the Panjáb Muhammadans, the YU'SUFZAIS and other such Paṭháns as inhabit British Territory. I saw the body of a SUBAHDÁR of the 26th Panjáb Native Infantry who had died at Quetta being carried down the Bolán Pass to be buried in the Pesháwar District, and on the Panjáb Railways

there are special rates and arrangements for the carriage of corpses. On the other hand among the Paṭháns travellers and often the dead on a field of battle are buried where they die, and the Ghilzais are always so buried. The reason given for conveying corpses to certain burial grounds is, that a Paṭhán should be buried by the tomb of the Pír or Saint he followed in life, at whatever distance it may be. This accounts for graveyards on the summits of mountains, as on Mt. Khwája Amrán in the Gwája Pass, and in the Tríkh Kuram and Pálkai Passes miles away from habitations.* I was told that parties on the road to and from a burial place were never molested. MacGregor† states with reference to the Ghilzais that it is the custom of the country to throw a heap of stones over a murdered traveller and that the road leading from Shilghar to Zu'rmat the frequency of these heaps is sickening, in many cases being found at the closed ends of ravines, showing that the poor travellers have run as far as possible and then been hewed down. The same remarks would be perfectly true of the long and narrow To'pobargh Valley near Mt. Mázhwö in the highlands separating the country of the Zakhpe'ls and Pánízais, a place particularly favourable for such murders, and the large number of such heaps as above described, sometimes three or four together, is horrible to contemplate. This method of forming cairns is common also in the Himalayan Districts, and I have seen Gurkhás in passing these Paṭhán cairns throw stones on them from sheer habit.

The Lu'nis form little pillars of rough stones to mark the spots of victories over the Beluchis, and several such pillars (fig. 16) are to be found in the Han Pass and about the Debatable Lands.

As might have been anticipated, of historical remains there are practically none. Indeed such could hardly be expected in a country which has no history to speak of, beyond petty internal squabbling, and no means of constructing buildings on any scale or of durable materials. In the Pishin there is an old ruined fort of the Háru'ns (Taríns) on a hill called Sire' Khila deserted about 60 years ago; and near Samálzai, not far from Khu'shdil Khán, a small artificial mound with some fortifications on it like those at Quetta, with which it has probably a similar origin. It is called Spín Khila (White Fort) but has apparently no local history. The only distinctly historical traditions which the Kákars appear to have relate to Náder Sháh's time, *i. e.*, only a century back, and in the Bo'rai all

* The Zakka Khe'ls, a wild troublesome tribe about the Khaibar, who have a bad name, are said to have stolen a saint from the Yu'sufzais and murdered him to obtain the Pí'r round whose grave they bury their dead. Tradition says that they are such scoundrels, that no man among them could be found whom even they could reverence after death as a saint.

† Quoted above in the section on Polity.

remains are locally referred to him. In the centre of the Valley a fort of some size built on the same principle as that at Quetta, but not so high and much more extensive, is called SHAHR-I-NÁDIR. It is now deserted and considerably ruined. The principle on which these forts were built is a very sound one in such a country, as the most desirable position from which to watch a valley is from an eminence so situated that all parts of the valley are visible at once, and at the same time that an enemy advancing from the hills must show himself. As it is very seldom that such eminences are natural they had to be constructed where necessary. This is the governing principle in the selection of the sites of Quetta and Kandahár, in fact the attempt to build Kandahár alongside one of the apparently strongly situated hills near it failed as a military measure.

In the BO'RAI Valley and along the route thence, *viâ* the HANUMBÁN, TRÍKH KURAM and HAN Passes, towards BÁRKHO'M a remarkable set of remains are found everywhere in the shape of large quantities of pieces of burnt bricks and pottery* of a manufacture and excellence not now known in these parts. These are found in all kinds of places, on the hill tops, in the valleys and passes and alongside streams. The inhabitants say they are the remains of NÁDIR SHÁH'S army, but as this was an old KÁFILA route, the present one *viâ* MEKHTAR being not far distant, it is as likely that the presence of the remains is due to this as to NÁDIR SHÁH'S march in this direction; it is, however, more than likely that he and his successor AHMAD SHÁH, the first DURÁNI and hero of PÁNÍPAT, or portions of their forces made more than one march along this route.

The state of civilization varies considerably with the locality, the inhabitants of the valleys being of course more civilized than their hill neighbours. As has been above observed, the more hilly the country the more scarce and rough the dwellings become, a sure indication of the general civilization of the occupants. The ZARKHÁNS and among the KÁKARS the DUMARS, ZAKHPE'LS, PÁNÍZAIS and AMAND KHE'LS bear off the palm for wildness, and their civilization is merely nominal. The UTMÁN and SANDAR KHE'LS present a substantial, though rude, form of civilization of the patriarchal type, as shown in their buildings, their husbandry, their better class of wearing apparel and the quantity of food supply, much of it foreign, which they possess, and the same is true of the LU'NI KHE'LS. The Kákars of the DO'B and GWÁL Valleys resemble their Pishín neighbours in almost everything, even to their habit of visiting foreign countries, and many an ÍSÁ KHE'L or SHAMOZAI Kákar is to be found, who has been in Karáchi and Bombay and even served as a sailor. In the Pishín there are many indications of a superior civilization, notably in the presence of

* Several specimens were sent to this Society by the present writer with the Geological collection he made in the districts under discussion.

women and children in the villages passed by the army, the knowledge of Hindústáni, which is there so frequent as to carry one anywhere through the valley, and the travelling habits of the people. These traits are more specially to be observed among the Pishin Sayads, than among the Taríns, though many of these speak Hindústáni fluently, as also can some of the Do'r and Gwál Valley Kákars. Many of the so-called Paṭháns who travel to all parts of India and even to Burmah selling horses are Pishin Sayads, some of whom make it a yearly practice to do so, keeping regular agents at Bangalu'r (in Maisu'r) and other horse marts. When the field telegraph was first opened at Gulistán Kárez in the Pishin, all private messages had to be countersigned by the Political Agent, whose tent was besieged by applications for telegrams from the Sayads and Taríns, who sent messages to all parts of India, one being addressed to Kandy in Ceylon.

VI. *Language.*

My observations under this head were the most unsatisfactory of all, as I was enabled to do little more than observe the variations in the pronunciation of place names.

The language spoken is Pushto* in dialects not, however, differing so much from the standard Pushto of our army as to prevent the soldiers from being readily understood. Its most prominent feature, the excessive gutturalness, seen in such words as Ghwazh, Ukhmughdai, Zhizha Tangai, is apparently such as is commonly to be found in the language, as also are the harsh cerebral ṭ, ḍ and ṛ, so frequently heard all along the route.†

The next most important feature for the purposes of this paper is the interchange of consonants in place names. Those that came under observation are the following, some of which are doubtless due to local dialectic variation.‡

Changes of J.

into d and z. Ngándeh = Ngánjeh: Syájgai = Syádgai = Sázdai.

into zh and y. Zho'b = Jo'b = Yo'b.

into z. Zai (the termination) = Zo'i = Jai = Jí.

into sh. Khúshlák = Khujlák.

* Or Pukhto. kh (خ) and sh (ش) are convertible sounds in the language.

† This is especially the case in the Bo'rai Valley and in the country approaching the Beloch Border. But this might be due to the propinquity of the Belóchhi dialects in which ṭ and ḍ are very hard.

‡ All such interchanges are valuable for comparing and identifying the names given by various authors to places along the same route.

into ch. KHUNCHAGAI = KHUNJAGAI.

Changes of Z.

into d. DARGAI = ZARGAI : MANZAKAI = MUNDAKAI : SANDAR KHE'L = SANẒAR KHE'L,

into ḍ. TO'R KHAIZE' = TO'R KHAIḌE'.

into zh. ZAWAR = ZHAWAR : ZADÚN = ZHADÚN.

into g. MULÁZAI = MALAGAI.

Changes of R and Ṛ.

r into ṛ. BO'RAI = BO'ṚAI : WARIÁGAI = WAṚIÁGAI.

r and ṛ into l. MÚLTAT = MURTAT : KALA = KIṚE' = KILE' : SHNAGÁL = SHNAGHAR = SHNAGHÁL.

ṛ into ḍ. KHWÁṚA = KHWÁḌA.

ṛ into zh. KIZHDAI = KIṚDAI.

Changes of D.

into g. ANGÁND = NGÁNG = NIGÁND : SYÁJGAI = SYÁJDAI.

Changes of G.

into k. KO'T = GO'T.

into gh. SHNAGÁL = SHNAGHÁL : GHWAND = GUND : GHUNDAMARAI = GUNDAMARAI.

into kh. GWÁJA = KHWÁJA.

Changes of KH.

into k. KSHO'I KÁRE'Z = KHSHO'I KÁRE'Z.

into gh. IGHBARG = IKHBARG.

Changes of F.

into v and b. I'SAF = I'SAB = I'SAV.

Changes of B.

into p. ALAB = ÁLIP.

Changes of S.

into sh. LASTAI = LASHTAI.

Changes of TS.

into ch. TSAMAULANG = CHAMÁLANG.

Changes of V.

into w. VATA'KRI = WATA'KARI.

Instances of the loss and addition of consonants are :

of G. PLA'NGZHARA = PLA'NZHARA.

of D and G. ANGA'ND = NIGA'N = NGA'NG.

of R. DUMAR = DUMA' : BAGHA'WA = BAGHAWAR.

of K. LASHTAI = LASHTKAI.

And instances of the transposition of syllables and consonants are :

of R. SURGHWAND = SRAGHA'ND.

of Gh. GHORARGAI = OGHBARGAI : ZAGHLÚN = GHAZLÚN.

of N. ANGA'ND = NIGA'ND = INGA'ND.

From the above examples it will be observed that the most unstable consonants are J, Z, ZH, R, D, G, KH, F, B, S, TS, and V, with their counterparts SH, CH, ZH, K, GH, B, and W.

Regarding consonantal interchanges peculiar to the Pushto language, Raverty (Gram. Pushto, p. 3) has noticed that kh (خ) is changed into sh (ښ), g (ګ) into zh (ژ), ts and dz into ch and j. And of the KHAIBARIS he observes that they so transpose their letters as to be almost unintelligible. In his Dict. of Pushto (xxii) he further notices the interchange of z into dz.

Of vowel sounds I noticed as peculiar an o pronounced in several words as the close German ö, thus, UZHDÖ, MA'ZHWÖ. And also the common termination ai (written by Raverty aey) which is sounded with a closed mouth and sharply as one syllable, though it partakes of the nature of two; thus, aí. The frequent recurrence of this last gives the language an uncouth sound, and, coupled with the prevalence of guttural consonants, an unpleasant harshness to English ears.

The vowel changes are not important, the following being the most noticeable.

Changes of A and A'.

a into i. ANGÁND = INGÁND: KAZHDAI = KIZHDAI: KALA = KILE' = KIṚE': TSAMAULANG = CHIMÁLANG: ALAB = ÁLIP.

a into u. MULÁZAI = MALAGAI: MANZAKAI = MUNDAKAI.

a and á into au. TSAMAULANG = CHIMALANG = CHIMÁLANG.

Changes of AI.

into i and o'i. ZAI = ZO'I = ZÍ: LÁKAI = LÁKÍ: BO'RAI = BO'RÍ: LÚNAI = LÚNÍ: DARGAI = DARGÍ.

into a. MANGAL = MAINGAL.

Changes of U.

into o. LÚNAI = LO'NAI.

Changes of I.

into e. ÍSAF = E'SAF.

Changes of WA.

into au. WAṚÍA = AUṚÍA.

into u and au. GHWAND = GUND: WAṚIÁGAI = UṚIÁGAI = AUṚIÁGAI.

into á. SURGHWAND = SURGHÁN.

into o. BAGHÁWA = BAGHÁO.

Among local peculiarities a tendency to shorten and nasalize long vowel syllables was frequently to be noticed, thus—

AMANDÚN for ÁMADÚN: ADINZAI for ÁDIZAI: BÁNZAI for BÁZAI: AJJÍ KHÁN for ḤA'JÍ KHÁN: HANUMBAR = ANUBAR: ANGÁND and NINGÁND =

Niga'n: Bahga'wa = Baghawar: and numerous other instances could be adduced.

The Persian silent w Raverty (Gram. Pushto 4) observes is always sounded in Pushto; thus خواب is pronounced Khwa'b, not Kha'b, خوان; is Khwa'n, not Kha'n. My observations in Kákar-land did not quite bear him out in this; for the following I found to be synonymous pronunciations. Akhund and Akhwand: Zarkha'n and Zwarkha'n: Surkhwa'b and Surkha'b, (where the w is a gratuitous insertion, the word being Surkh + a'b, red water): Surghwand and Surgha'n.

Before leaving the vowels a curious insertion of y in the following word is worthy of remark. Cho'tia'li is locally Cho'ta'lai: Zakhpe'l and Zakhpye'l are synonymous and so are Sya'jgai and Sazgal.

The following is a list of the various forms under which place names were found by myself and on which the foregoing observations are based.

1. Anga'nd = Nga'njeh, Niga'njeh, Niga'n, Ingan, Ninga'n, Nga'ng, Niga'nd, Angand, Nga'ndeh.*
2. Muzarai = Mzarai.
3. Ajjí Kha'n = Ḥa'jí Kha'n.
4. Gwa'ja = Khwa'ja.
5. Skan = Iskan.
6. Zai = Jai, Jí, Zo'í.†
7. Zho'b = Jo'b, Yo'b.
8. Ísaf Kach = Ísab Kach, E'sab Kach, E'saf Kach, Yúsuf Kach.‡
9. Khabarzangai = Khabarzangai.
10. Alla'hda'd = Kha'lakda'd.§
11. Khúshla'k = Khujla'k.
12. Kizhdai = Kirḍai, Kazhdai, Kizhdí.‖
13. Kala = Kile', Kire', Ko'r.‖
14. Surkhwa'b = Surkha'b.
15. Khunchagai = Khunjagai.
16. Go'ṭ = Ko'ṭ.‖
17. Khsho'í Ka're'z = Ksho'í Ka're'z.

* Jeh is for Deh, a village. These words represent the Lúr Angáno and Kúz Angáno of the map (Do'r Valley).

† To show pronunciations of ai: this is a termination not a word.

‡ These names arise from the confusion between Ísav and Yúsuf (Esau and Joseph).

§ These words have the same meaning, *viz.* God-given: there is a similarly named village near Kandahár.

‖ These are not place names.

18. Zhawar = Zawar.
19. Ighbarg = Ikhbarg.
20. Ámadún = Amandún.
21. Ádizai = Adinzai.
22. Zadún = Zhadún.
23. Mangal = Maingal.
24. Ba'zai = Ba'nzai.
25. Surghwand = Surgha'n, Surgha'nd, Sragha'nd, Surghan, Surghand, Sraghand.
26. Shnaga'l = Shnaghar, Shnaghal, Shnagai, Shna' Khorai.
27. Waṛía Kach = Auṛía Kach.
28. Wargai = Bargai.
29. Mula'zai = Malagai.
30. Zakhpe'l = Zakhpye'l = Zakhwai.
31. Ghobargai = Oghbargai.
32. Dumaṛ = Duma'.
33. Sya'jgai = Sya'dgí, Sya'dgai, Sa'zai, Sya'jdai, Sazdai.
34. Khwa'ṛa = Khwa'ḍa, Khwa'ṛ.
35. Zaghlún = Ghazla'na, Ghazlún.
36. Dargai = Zargai, Dargí.
37. Ghundamarai = Gundamarai.
38. Ghwand = Gund.
39. Pla'nzhara = Pla'ngzhara.
40. Surmastaili = Surmasta'li.
41. Baia'nai = Bia'ní.
42. Sandar Khe'l = Sanzar Khe'l.
43. To'r Khaize' = To'r Khaide'.
44. Cho'tia'li = Cho'ta'lai.
45. Bo'ri = Bo'ṛai, Bo'ṛai.
46. Lashtai = Lastai, Lashtkai.
47. Waria'gai = Waṛia'gai, Uria'gai, Auria'gai.
48. Hanumba'r = Anuba'r, Anumba'r, Hanuba'r.
49. Múltat = Murtat.
50. Lúni = Lo'nai, Lúnai.
51. La'kai = La'kí.
52. Tsamaulang = Chimalang, Chamalang, Chamaulang, Chama'lang, Cha'malang.
53. Alab = Álip.
54. Soba'h = Soba't.
55. Bagha'wa = Bagha'o, Baghawwa'r.
56. Vata'kri = Wata'kari.
57. Zarkha'n = Zwarkhán.

58. To'r Tsappar = To'r Tsuppri.*

59. Paste' = Pasto'.

60. Manzakai = Mundakai.

The frequent recurrence of certain names on the map leads to the supposition that many of them are merely descriptive and on examination the meanings of a great portion become apparent, the descriptive words having changed very little on becoming names of places.† And though it is always treading on dangerous ground to give derivations of place names, I think the following are worth hazarding:

1. Tangai means a gorge or pass, so Spír Tangai would be the White Gorge (Spír for Spín) and Túr Tangai the Black Gorge (Túr for To'r.)

2. Ghund is round, globular and the Ghund Peak would mean the Round Hill, and Mt. Surghwand the Red Round Hill. Again Ghunda is a detached hill and Ghundamarai is Adam's apple in the throat, and as applied to a village would mean the village by the round detached hill.

3. Lwa'ra means hilly and as applied to a valley would signify the hilly or upland valley.

4. Chor means a ravine or water furrow and is applied to a steep-banked stream in the Pishin.

5. Sire' Khila would be the Inn or Caravanserai Fort. It was the old rendezvous of the Hárún Tarín in the Pishin. This is probably also the meaning of Zara Khila in the Pishin.

6. The Gaz Hills might mean the Long Hills from گز a yard-measure or the Tamarisk Hills from غز a tamarisk.

7. Mzarai means a particular kind of reed and is applied to a river, a valley, and some marshy springs and the hills near these last.

8. Surkha'b is the Red River.

9. Zarghún means green, verdant, fresh and is applied to a range of mountains covered with forest in the heights and to a village by a stream.

10. Lúr means Upper and Kúz, Lower, when found in composition with place-names. Lo'we' and Lo' mean Greater: Kuchnai and Kaun, Lesser.

11. In Mehtarzai, Mehtar is Persian meaning "master, ruler." Mehtarzai would mean the Ruling Clan.

12. Ghwazh means a sluice and also the ear, and is found applied to a stream and a range of the hills, the Spín Ghwazh, (?) the White Ear Hills. Zhwazh means the murmuring of a brook and may be the deriva-

* A corruption of Kálí Chuppri the Belóch name for the same place with the same meaning, *viz.*, Black Rock. Thus Trikh Kuram is called also So'r Kuram, which has the same meaning, Salt Springs.

† I do not here refer to such purely men's names as Habíbullah, Khúshdil Khán, transferred to the villages owned by the persons of these names.

tion of the river name, whence perhaps also ZHIZHA TANGAI (?) the Rippling Pass.

13. Mt. KAND may derive its name from KAND a chasm or KANDAI broken ground.

14. Mt. PÍL from its fancied resemblance to an elephant, PÍL or FÍL.

15. SHARAN KA'REZ and SHARAN occurring two or three times and once as SHE'RÍN, are probably for SHÍRI'N, sweet.

16. SÚR or SURAI is red and is met with in several words. SURAI also means a passage and the so-called SURANA'RI Pass (the SURAI Pass of my maps) is for SURAI NARAI, the Slender Passage. Cf. also LA'NDAI SURAI (?) the Lower Passage. MO'MAND SARA'I (?) the Momand's Passage.

17. The word GHBARG, as in OGHBARG, IKHBARG, IHGHARG and in the plural forms GHOBARGAI and OGHBARGAI, occurs several times. It means the flat land between two hills, and upland valley: also double, two, twins. In which latter sense it is probably used when applied to hills. And hence also NARAIGHBARG Hills may mean the Narrow Valley Hills.

18. RO'D means merely a river: RO'DBA'R, a valley stream.

19. KSHAI means in, between, etc. and KSHO'I KAREZ might mean the Middle Káréz.

20. KHWARA is probably for KHWARA, a sandy stream-bed, as several such beds debouche into the SHOR valley at the spots so named.

21. SAGAR, SRAGHAR, SARGHAR, SURGHAR all common names mean the Red Hills (SUR+GHAR). So the SAGARBAND Pass would be the Red Hills Pass.

22. SURKAI ZANGAL is the Red Forest.

23. DARGAI, a very common name, is the plural of DARGA, a copse, a place where trees and brush-wood grow together. DARGA also means a shrine and this may account for its application to villages.

24. GURKHAI is applied to a mountain stream and its defile and may mean rattling, noisy, as GARKAI is the rolling of a carriage and GARKANDA a rolling stone from a mountain.

25. ZAWAR or ZHAWAR (ZAWAR) is a slope, declivity. LWAR ZWAR is uneven ground. ZHAWAR also means a deep or hollow place.

26. USH or UKH is the camel. The USH Pass means the Camel's Pass, and the UKHMUGHDAI Pass the Camel's Mouth Pass. (UKH+MAKH).

27. UZHDÖ, the name of a peak, is apparently the plural of UZHD, U'ZHD and U'KD, long, lengthy, stretched out.

28. TSA'RU Peak = ? the Look-out Peak.

29. The MO'SAI Pass may derive its name from MO'SAI, a child's marble, a round stone, or from MO'ZI', troublesome.

30. KACH is the cultivation by a stream-bed and is seen not only by itself as a name for a stream, a village and a hill, but constantly in compo-

sition, as Isaf Kach, Esau's Plot, Ta'zi' Kach, Greyhound Plot, Ko'sh Kach, Crooked Plot, Waṛía Kach, the Free Plot, Súr Kach, the Red Plot, Zagan Kach (?) the Rough Plot.

31. Sho'r which constantly appears as a name is probably for Sho'ra or Kho'ra, saltpetre, nitre: a common property of the soil along the route. It appears again in So'r Kúṛàm, the Salt Springs.

32. Shna' Khorai occuring as a synonym for Shnagha'l, a village name, would mean a Mastic Eater.

33. Tri'kh is salt, bitter, and appears in Trikha'dagh, the Salt Hillside, if Da'gh is for Ta'k, or the Salt Plain, if Da'gh is for Da'g: and in Tri'kh Kúṛam, the Salt Springs.

34. Chappar or Tsappar, a corruption of Hind. Chhappar a thatched roof appears as a hill name in Mt. Chappar and in To'r Tsappar, the Black Roof, a hill in the Han Pass. Both peaks have rounded tops. It is worth mentioning here that Tsapa means a wave, billow.

35. Chi'nai is a common village name and is the plural of Chi'na, a spring, fountain.

36. Ghar, a hill, appears in Mt. Spinskhar, the White Hill: Spe'raghar Hills, the Grey Hills: Tang Ghar, the Narrow Hills. Zhar, appearing in several hill names, is probably for Ghar: Zharpitau Peak, the Sunny Peak, Pla'nzhara Hills, the Broad Hills; Zharuband Peak, Hills End, is given to the last hill of a line in the Sho'r Valley.

37. Ispira Ra'gha, the Open Meadow (Spaṛai + Ra'gh); the place is an open spot near Mt. Ma'zhwö. Spaṛai, open, also turns up once or twice as Sapurai.

38. Mt. Surlo' (?) the Red Tablet.

39. Tang To'r Peak, the Narrow Black Peak.

40. Surtak Peak, the Red Precipice.

41. Male'wa Peak (?) The Camel Sack (Malav).

42. La'ndai Peak, the Lower Peak.

43. Pla'n Springs, the Wide Springs.

44. Khúni' Hills, the Bloody Hills.

45. Shaka're'z (?) The Back Káréz and Jalka're'z, the Thorn Káréz; two villages near each other in the Bo'rai valley. Shaka're'z occurs twice.

46. Kutsa or Kucha Valley means perhaps the Little Valley.

47. Tsa'han Wells. Tsa'han is the plural of Tsa', a well, pit. The word appears again as Uchsaha'n Springs. (?) The Upper (új) Springs.

48. Ba'ghu To'r Peak (?) The Black Bogie. Ba'gú is a bugbear, bogie.

49. Ba'la Dha'ka (?) The Upper Plain (da'g).

50. Hanokai is probably a diminutive of Han, the two passes being near each other.

51. Toghai, a river name, is Turki for a reedy plain.

In a former paper in this Journal* I remarked that a village may be called by six different names by guides, those thoroughly acquainted with the locality would recognise it by any one of them, others less well acquainted will only know it by some of them. Thus a village may be called (1) after the district or tract of land in which it is situated. TAKHT-I-PÚL is such a name, MEL MANDA is another; villages 10 miles apart are called TAKHT-I-PÚL and MEL MANDA simply because they are situated in the tracts so called. (2) It may be called after the section of the tribe which inhabits it, thus, BA'RAKZAI; (3) after the subdivision, thus, KHUNSE'ZAI or MOHAMMADZAI, (4) after its late owner if recently dead, (5) after its present owner, thus, KALA-I-NÚR-UD-DI'N KHA'N merely means NÚR-UD-DI'N KHÁN's village, and the owner's is usually the proper name of a village, (6) after its own name. To give an example; the village marked AMI'N KALA in my map of the ARGHISA'N valley was named to me as BA'RAKZAI, MUHAMMADZAI, AMI'N KHAN and LATI'F KHA'N. LATI'F KHA'N is its present owner: AMI'N KHAN was the late owner, MUHAMMADZAI is the subdivision and BA'RAKZAI the section of the tribe inhabiting it. It will be easily seen that the more general terms are known at a distance and the more specific ones only in the immediate neighbourhood of a village. Complicated as this system of nomenclature looks, it is natural enough in a country where the individual occupies such an important place in men's minds and nationality so little. It is not difficult to deal with in practice, after a slight knowledge of the country is acquired, but it accounts for the great apparent discrepancy in names and distances met with on maps and in routes. These remarks are true also of the TARI'N and KA'KAR country. Thus in the PISHIN, GANGALZAI and SHA'HDA'D are names for the same place, and so are URUMZAI and SAYAD SA'LO and also BRIJA'N KALA and AULI'A KALA. Several villages are called BRAHAMZAI, *viz.*, SAYAD DO'ST MOHAMMAD, SAYAD KHAMA'NDAI, SAYAD LA'L. Three are called LÚR (Upper) KHA'NIZAI, *viz.*, MOHAMMAD SA'DIK, VAKI'L, and LA'L MOHAMMAD and two BAGARZAI, *viz.*, SAYAD ALAB and SAYAD PAIYO; two YA'SINGZAI, *viz.*, SAYAD SHE'RBAT and SAYAD TO'TI. The more specific are the malik's (or owner's) names. In the case of the BRAHAMZAI villages, that of DO'ST MOHAMMAD may be called BRAHAMZAI proper, and the same is to be observed of the three KA'KOZAI villages in the same neighbourhood, one is called KA'KOZAI and the other two also MADAT and ATA' MOHAMMAD. On entering the DO'F valley the two villages known in the Pishin by several variations of the word ANGA'NG or NINGA'ND are found to be locally LÚR and KÚZ ANGANG, Upper and Lower ANGA'NG. Names, however, are more specific in the DO'F, and villages of the same name are distinguished by the tribal name in addition, thus TLARAI (ISÁ KHE'L) and

* Rough notes on the Distribution of the Afghán Tribes about Kandahár. Vol. XLVIII, pt. I, 1879.

Tlarai (Mehtarzai). In the Bo'rai valley, however, Wazia'gai and Khankai seem to be general names for groups of villages and we have two Múrs and two Waha'rs. In the wilder parts names become more general and merely descriptive, everything in the neighbourhood, valley, river, village and hills, all being known by the same name. Such are, O'bushtkai, Khwa'ṛa, Chimja'n, Kach, Baia'nai in the Sho'r valley, and in still wilder regions Nangalúna, To'pobargh, Tri'kh Kúṛam, Tsamaulano and Ba'la Dha'ka. Towards the Belóch Border double names, the Paṭhán and the Belóch are met with, as To'r Tsappar and Ka'li' Chuppri, both of the same meaning, the Black Hill: and Ba'han Kund (Paṭhán) = Bani'wa'la' Kach (Belóch).

Some names are corruptions and abbreviations; such as Sayad Sa'lo and Sa'yad Á'tu probably, and perhaps Skan and Iskan for Alexander (Iskandar): Ajji' for Ḥa'ji': Sama'lzai for Isma'ilza'i: Brahamzai for Ibra'himzai: Á'lip and Alab for Ḥalab (Aleppo): and perhaps Sopa'nzai for Isfaha'nzai.

In places there seems to be a tendency to call villages after the names of celebrated places, thus we have Di'lai, La'ho'r and Múltat in the Bo'rai valley.

Before leaving this point I would remark that across the Belóch Border in Ba'rkho'm (or Ba'rkha'n) a similar if not a greater confusion of nomenclature exists. Thus the place called Luga'ri' Ba'rkha'n is also called Bangala': Hasni' Ko't = Ta'nkhi Shahr: Cha'he'n = Ba'bul Kha'n ka Ko't or Shahr: Na'ndha' = She'kh Ko't while all the Na'har villages are sometimes grouped as Na'har Ko't, and finally the valley itself is variously called Ba'rkho'm, Ba'rkha'n, Luga'ri Bárkhán, Lúndi'a'n and Kaho.

Having now explained as far as possible the reasons why the nomenclature of travellers* along the same route in Afghanistán should differ so greatly, and in order to clear the way for future students of this particular route, I close this paper by a comparison and identification of names found in the journals of other travellers with those to be found in my maps. Included among these are the nomenclature in Capt. Holdich's plane-table sketch-map of the Route and in the Quarter Master General's Departmental sketch-map, and also the names given in Major Waterhouse's paper in this Journal.†

* Capt. Heaviside remarks on the difficulty of obtaining Afghán names, in Major Waterhouse's report, pp. 53. J. A. S. B. Vol. XVIII, pt. II, 1879.

† The works referred to in the comparison are Notes on the Survey Operations in Afghanistán in connection with the Campaign of 1878-9 by Major Waterhouse, J. A. S. B. 1879. Mackenzie's Routes in Asia, Sec. II, Afghanistán. Macgregor's Gazetteer, Afghanistán, Leech's Route: Dera Gházi Khán to Kandahár. Lumsden's Mission to Kandahár. A more detailed identification of the names along the route will be found in the appendix to my paper in the J. R. G. S. above referred to.

I.—*Han Pass and Neighbourhood.*

Temple.	Macgregor.	Sandeman.	Holdich.	Q. M. G.	Waterhouse.
Ma'r Pass	Ma'r		Ma'r	Ma'r	...
Isha'ni	Isa'ni'	...	...	...	...
Da'ka (Ba'rkha'n)	Dakku Kot		Dakku Kha'n	Dakka	...
To'r Tsappar / Ka'li' Chuppri'	Ka'la Chapri' / Ka'la Chapr	...	...	...	...
Hanokai Pass	Hanki' Sar	...	Hannokai	Hannakoi	Hanukai.
Kutsa Valley	Kucha	...	...	...	...
Tri'kh Kuram	So'r Kuram	...	Treek Kuram	Trekh Kuram	Trikh Kuram.
Paind Kha'n Ko't	Paindeh Kha'n Kot' / Paindeh Kha'n Luni' / Paindeh Khán Shahr / Paindeh Kha'n Ko't / Lúni / Paindeh Shahr	...	...	...	...
Ba'la Dha'ka / Ba'la Dha'ki'	Ba'la Da'ka	Ba'la Dha'ka	Ba'la Da'ka	Ba'la Da'ka	Ba'lla Da'ka.
Cho'r Tarap	Cho'r Trap	...	...	Cho'r ki Tap	...
Ja'ndhra'n Hills	Ja'ndra'n		Ja'ndra'n	Ja'ndra'n	...
Dhaula Hills	Dha'ola	...	Dhowla	Dhowlah	...
R. Ka'han	R. Ka'ha	...	...	...	...
Tsamaulang	Chuma'lang	...	Chama'lang	Chama'lang	Chama'lang.
R. La'ki	R. La'ki Lahar	...	...	...	...
Ba'rkho'm / Ba'rkha'n	Ba'rkha'n	Ba'rkha'n	Ba'rkha'n	Ba'rkha'n	Ba'rkha'n.

Temple.	Macgregor.	Sandeman.	Holdich.	Q. M. G.	Waterhouse.
Mitthí Khúín	Mita Koh	...	Han Kúa	Han Ku'a	...
Ba'han Kund	Ba'hanwa'la' Kach	...	...	Ba'hanwa'la'ka'ch	...
Barbúz Hills	Barbo'j / Barbo'z / Birbo'z	...	...	...	...
Bagha'o	Bagha'o	...	...	...	...
Sraghar (Lúni Valley)	? Shinghar / ? Sanghai	...	...	...	...

II.—*Tal, Chótiáli, and Neighbourhood.*

Temple.	Macgregor.	Sandeman.	Holdich.	Q. M. G.	Waterhouse.
Cho'tia'li	Cho'ta'li	Cho'ta'li	Cho'tia'li	Cho'tia'li	Cho'tia'li.
Ko'lu	Ko'lu	Ko'lu	Ko'lu	Ko'lu	...
Tal	Thal	Thal	Tull	Thull	Thal.
Ra'ha	Ra'h / Ra'hi	...	Ra'ha	Rehi	Rehi.
Bagha'wa	Bagha'o	...	Bagha'o	Bagha'o	Bagha'o.
Smalan	Smalan	...	Smalan	Smalan	Smalan.
Shinle'z	...	Shinja'zai	Shinlaze	Singlazi	...
Sinza'vai	...	Shinja'vi	Singa'wi	Sanja'wi	Saga'we.

Temple.	Macgregor.	Sandeman.	Holdich.	Q. M. G.	Waterhouse.
Mittní Khúín	Mita Koh	...	Han Kúa	Han Ku'a	...
Ba'han Kund	Ba'hanwa'la' Kach	...	...	Ba'hanwa'la'ka'ch	...
Barbúz Hills	Barbo'j / Barbo'z / Birbo'z	...	...	...	...
Bagha'o	Bagha'o	...	...	...	...
Sraghar (Lúni Valley)	? Shinghar / ? Sanghai	...	...	...	...

II.—*Tal, Chótiáli, and Neighbourhood.*

Temple.	Macgregor.	Sandeman.	Holdich.	Q. M. G.	Waterhouse.
Cho'tia'li	Cho'ta'li	Cho'ta'li	Cho'tia'li	Cho'tia'li	Cho'tia'li.
Ko'lu	Ko'lu	Ko'lu	Ko'lu	Ko'lu	...
Tal	Thal	Thal	Tull	Thull	Thal.
Ra'ha	Ra'h / Ra'hi	...	Ra'ha	Rehi	Rehi.
Bagha'wa	Bagha'o	...	Bagha'o	Bagha'o	Bagha'o.
Smalan	Smalan	...	Smalan	Smalan	Smalan.
Shinle'z	...	Shinja'zai	Shinlaze	Singlazi	...
Sinza'vai	...	Shinja'vi	Singa'wi	Sanja'wi	Saga'we.

III.—*Bórai Valley and Neighbourhood.*

Temple.	Macgregor.	Holdich.	Leech.	Q. M. G.	Waterhouse.
Bo'rai Valley Bo'rí	Bo'ra Bo'ri	Bho'ri	Bo'ri	Bo'ri	Bo'ri.
R. Hahumba'r Hanuba'r	Anaba'r	Anumba'r	...	Anamba'r	Anamba'r.
Me'khtar	Me'khtar	...	...	...	...
Ninga'nd	Niga'ndh Inga'd	Nimga'n	...	Ninga'n	Ninga'n.
Barminai	Barnamai	Barnemai	...	Ba'memai	...
Me'nd Pass	? Mena	...	...	...	...
Naigwa'l	? Gwa'l	...	...	...	...
R. Lo'ralai	Looralaie	...	...	...	...
Shabozai	Shambozai	Shabozai	...	...	...

IV.—*Shór Valley to Pishin Valley.*

Temple.	Macgregor.	Sandeman.	Leech.	Lumsden.	Holdich.	Q. M. G.	Waterhouse.
Dargai (Sho'r Valley)	Dargai Dargí	...	...	Darga'e	Dargai	Dargai	...
China'li	? Chena'ti	...	...	...	China'li	China'li	...
Chimja'n	...	...	Chinja'n	Chinja'n	Chimja'n	Chinja'n	Chimja'n.
Mt. Chapar	Chapr Chaprí	...	...	...	...	...	...
Zagan Kach	...	...	? Sazan	...	...	...	...
R. Surkha'b (Do'r Valley)	...	...	Surkha'b Ford	...	Surkha'b	Surkha'b	...

Temple.	Macgregor.		Sandeman.	Holdich.	Q. M. G.		Waterhouse.
Kach	? Katgah	...	...	...	Kats	...	...
Dumar	Dhumad	...	...	...	Dumar	...	...
Spe'zhandai	...	Spinzandai	...	...	Spe'zandai	Spe'zandai	...
Isap Kach	Yu'sap Kach / Isab Kach	Isab Kach	...	...	Yu'sup Kach	Yu'sap Kach	Eusap Katch.
Ninga'nd / Anga'ng	...	Naga'nd	...	...	Anga'nd	Ninga'nd	Ninga'n.
Ka'kar	Ka'kar	Ka'kar	Ka'kur		Ka'kur	Ka'kur	Ka'kar.

V.—*Pishin Valley and Neighbourhood.*

Temple.	Macgregor.	Sandeman.	Holdich.	Leech.	Lumsden.	Q. M. G.	Waterhouse.
Amand khe'l	Sanatya	...	...	...	Simantha	...	...
Sha'hda'd	...	...	...	...	Sha'hda'd	...	...
Kala-i-Abdulla-Kha'n	...	...	Kila Abdulla	...	...	Kila Abdulla Kha'n	Kila Abdulla.
Pishin	Pe'shín	Pe'shín	Pishin	Pe'shín	Pe'shín	Peshin	Pishin.
Kho'jak	Kho'jak	Kho'jak	Kho'jak	Kohjak	...	Ko'jak	Kho'jak.
Barsho'r	Barsho'ra	...	...	Barsho'r	...	...	...
Sayad Paind	Pain Kala	...	Saipa'n / Saipain	...	...	Saipa'n	...

A comparison of the names to be found on the three latest maps of this route, namely, those of my own, Capt. Holdich, and the Quarter-Master General's Department, will complete my observations.

From the Pishin eastwards.

Temple.	Holdich.	Quarter-Master General.
Kadanei Valley	Kadanai	Kadanei.
Kho'ja Amra'n Hills	Kho'ja Amra'n	Kho'jeh Amra'n.
Khwa'ja Amran Peak	Kwa'ja Amran	...
Kala Abdullah Kha'n	Killa Abdula	Kila Abdula Kha'n.
Gwa'ja Pass	Gwa'ja	Gwaja.
Tangai	Tangí	...
Kho'jak Pass	Kho'jak	Ko'jak.
Arambi	Arumbi	Arumbi.
Rahamdil Kha'n	Ra'mdil Kha'n	...
Badwa'n	Budwa'n	Badwa'n.
Turkhe'l	Turkhe'l	Turkhail.
Brija'n Kala	Maisai & Paizí	...
Sayad Salo Urumzai	Uramzai	...
Sha'hda'd Gangalzai	Gangalzai	...
Ajabzai	Ajabzai	Ajabzai.
Sayamzai	Se'mzai	Se'mzai.
Alízai	Alazai	Ali'zai.
R. To'ghai	To'ghai	...
R. Muzarai	Muzarai	...
Sopa'nzai	Ze'ri'	...
Brahamzai	Brahamzai Brainzai	...
Ma'likai	Ma'lizai	...
Bagabzai	Baggarzai	Bagarzai.
Sama'lzai	Sma'lzai	Sma'lzai.
Sayad Pain	Saipa'n & Saipain	Saipa'n & Pain Kala.
Noa' Ba'za'r	...	Noa' Ba'za'r.
Manzakai	Manzakai	Manzakai.
Kha'nizai	Kha'nzai	Kha'nzai.
She'kha'lzai	Sheikha'ri	Sheikhaha'ri.
Khu'shdil Kha'n	Kushdil	Khushdil.
R. Barso'	Barso	Barso'.
Ma'likya'r	Ma'likya'r	Ma'likya'r.

Temple.	Holdich.	Quarter-Master General.
Kama'lzai	Kama'lzai	Kama'lzai.
Nu'rzai	Na'ria'n	Na'ria'n.
Ya'singzai	Á'simzai	Á'simzai.
Tari'n	Turi'n	Turi'n.
Surai Pass	Surina'ri	Suruna'ri.
Anga'ng	Anga'nd	Ninga'nd.
R. Surkha'b	Surkha'b	Surkha'b.
Mohammad Sharfi	Saria'da Ka're'z	Sarea'da Ka're'z.
Mt. Kand	Kund	Kand.
Mehtarzai	Me'trazai	Me'trazai.
Tlarai	Talarai	Larai.
Murghai	Murgha'	Murgha'.
Sharan	Shiran	...
Nari'n	...	Nari'n.
Balozai Ka're'z	Balozai	Bulozai.
Sa'ghai	Sargai	Sargai.
Sama'wan	Zemirsta'n	Zemirsta'n.
Kha'nizai Ka're'z	Kha'nzai	Kha'nzai.
Shakar	Sakkar	Sakkar.
Zarghu'n Ka're'z	Zergu'n Ka're'z	...
Ksho'i Ká're'z	Kuso'i	Kuso'i.
R. Ro'd	To'gai	To'gai.
Gwa'l	Gwa'l	Gwa'l.
Pishin	Pishin	Pe'shi'n.
Mt. Takatu'	Takatu'	Ta'tucka.
Wochakhla	Tura Kala	...
Ukhmughdai Pass	Okhmukhzai	Uchmuchzai.
R. Zadu'n	...	Zerdu'n.
Á'madu'n	Á'madu'n	Á'madu'n.
Mt. Zarghu'n	Zerghu'n	Zerghu'n.
Ka'kar	Ka'kur.	Ka'kur.
Isap Kach	Yusuf Kach	Yusaf Kach.
Ush Pass	Ushta'ra	Ushta'rah.
Mt. Mazhwö	Mashkwar	Mashkwar.
Spe'zhandai	Spe'zandai	Spe'zandai.
Ispira Ragha	Spiraragha / Spirargh	Spirara'ghah.
Mt. Spinskhar	...	Spinskhar.
Dumar	Dumar	...
Mt. Surghwand	Surkand	Zergu'n.
Zho'b Valley	Zho'b	Zho'b.

Temple.	Holdich.	Quarter-Master General.
Nangalu'na Pass Mo'mand Sara'i Mo'mand	Mo'mandgai	Mamanagi.
O'bushtkai	O'boskoi	O'boskoi.
Chimja'n	Chimja'n	Chinja'n.
Pa'lkai Pass	Pa'lki'	Pa'lki'.
Warghas	Wergus	...
Hindu Ba'gh	Hindu Ba'gh	Hindoo Ba'gh.
Gurmai	Gurmi'	Gurmi'.
Mt. Matkhilar	Mashkhilar	Mashkilar.
Mt. Sya'jgai	Sia'sgai	Sia'sgai.
Dargai	Dargai	Dargai.
China'li	China'li	China'li.
Sungalu'n	Shundlu'n	Shu'n Lu'n.
Ka'sai Hill	Mana'ra	Mana'ra'.
Kach	Kats	Kats.
Baia'nai	Bia'ni	Bia'ni.
Sarkai Zangal	Skaijangal	Skaijangal.
Ninga'nd	Nimga'n	Ninga'n.
Ghobargai Hill	Gobargi'	Gobargi'.
Smalan	Smalan	Smalan.
Sinzawai	Singa'vi	Sanja'vi.
Shinle'z	Singlaze	Singlazi.
Bagha'wa	Bagha'o	Bagha'o.
Jalka're'z	Ka're'z	Ka're'z.
Shaka're'z	Shahka're'z	Shahka're'z.
To'r Khaize' Hills	Durgainni Darmangarh	Durgunny.
Lashtai	Lashtai	Lushtai.
Waria'gai	Uriasgai	Uriagai.
Zangiwa'l	Zangiwa'l	Zangiwa'l.
Khankai	Konkai Chaplai	Konkai. Chaplai.
Ro'dli'n	Kudisai	...
Navgivya'la	Malaiyam	Malaian.
La'ho'r	La'hor	Lahore.
Di'lai	Delhi	Delhi.
Mu'ltat	Mudduk	Mudduh.
Dargai	Dargai	Dargai.
Shabozai	Shabozai	Shabozai.
Sharan	Sho'ra'n	Shora'n.

Temple.	Holdich.	Quarter-Master General.
Barminai	Baranmai / Ba'memai	Bamemai.
Da'lo'r	Dalu'r	Dalur.
Sagharai	Sagre'	Sagre'.
China' Ko't	Chinna	Chinna.
Kachai	Katsai	Katsai.
Kana'	Khana	Khana.
Kach	Kats	Khas.
Sharan	...	Shoran.
Sha'ba'n	Shamurlak	Shamarlak.
Kaun Waha'r	Awaha'r	Awa'har.
Kuru	Khru	Khuru.
Hanumba'r	Anumba'r	Anambar.
Gadiwa'r	Gadba'r	Gadbar.
Sarghar Peak	Tatri	Tatari.
Lu'ni	Lu'ni	Lu'ni.
Shaugwa'l	Shahgolai	Shahgolai.
Tri'kh Kuram	Trekh Kuram	Trekh Kurram.
Raha	Raha	Rehi.
Tal	Tull	Tal.
Cho'tia'li	Cho'tia'li	Cho'tia'li.
Ko'lu	Ko'lu	Ko'lu.
Brahamzai Khela't	Pa'ramzai	Ba'ramzai.
Ma'r Pass	Ma'r	Ma'r
Tsamaulang	Chama'lang	Chama'lang.
Hanokai Pass	Hannokai	Hannakoi.
Ba'la Dha'ka	Ba'lada'ka	Ba'llada'ka.
Mitthi' Khu'i'n	Hanku'a	Hanku'a.
Han Pass	Han	Han.
Ja'ndhra'n Hills	Ja'ndra'n	Ja'ndra'n.
Cho'r Tarap	...	Cho'r Ki' Tap.
Ba'han Kund	...	Ba'hanwa'la' Kach.
Chapar Hills	Chapar	Chapar.

On the Súryaprajñapti.—*By* Dr. G. Thibaut, *Principal, Benares College.*

Part II.

(*Continued from* p. 127.)

Although ancient Indian astronomy was chiefly interested in the moon and although the greater part of the Súryaprajñapti treats of her, especially of the places she occupies at different times in the circle of the nakshatras, a detailed connected account of her motions is not given anywhere, and we must combine the hints we meet with here and there, in order to understand the theory by which the old tírthankáras tried to explain to themselves her motion. In doing this we are of course greatly aided by the full and unambiguous account given of the sun's motion, since it will not be presuming too much that the theory which had been applied to the one luminary would be applied to the other one also. As we have seen above, the sun's daily apparent motion is regarded to be his true one and considered to take place round Mount Meru; his yearly motion is the consequence of his moving more slowly than the stars; his motion in declination is the result of his describing round Mount Meru circles of varying diameter. All this is applied to the moon too. The moon describes (or the two moons describe) circles round Mount Meru at the height of eight hundred and eighty yojanas above the earth, so that her place is eighty yojanas above that of the sun. She moves slower than the stars and slower than the sun; while the latter describes during one yuga 1,830 (or strictly speaking 915) circles, the moon describes only 1,768 (or again on the assumption of two moons 884) such circles; the difference of the two numbers = 62 indicates the number of times the moon enters into conjunction with the sun. During the same period, *viz.*, the quinquennial yuga, the moon completes sixty-seven sidereal revolutions. Each of these revolutions is, analogously to the sun's revolutions, divided into two ayanas, an uttaráyaṇa and a dakshiṇáyana, according as the moon is proceeding towards the north or the south (of the equator as we should add). In reality, it is true, the motion of the moon is much more complicated, as it is not only oblique to the equator, like the ecliptic in which the sun is moving, but also inclined to the ecliptic itself at an angle of about 5°, while moreover at the same time the points in which the moon's path cuts the ecliptic are continually receding. One of the consequences of the revolution of the nodes did, as we shall see below, not escape the observation of the author of the Súryaprajñapti, but he was manifestly unable to account for it by a modification of his theory. According to him the moon, like the sun, simply describes concentric circles round Mount Meru, some-

times approaching it sometimes receding from it. While, however, the period of the sun's progress from and towards Mount Meru comprises one year—the time which the sun employs in arriving again at the same star—the corresponding period of the moon embraces one nakshatra month = 27 days, $9\frac{1}{67}$ muhúrtas. From this it is easy to find the number of the circles the moon describes. She performs during one yuga 1,768 complete revolutions, consequently during one nakshatra month $\frac{1768}{67} = 26\frac{26}{67}$ revolutions, and during one ayana or sidereal half month $13\frac{13}{67}$ revolutions. The moon therefore proceeds towards the north during the time which she wants for describing $13\frac{13}{67}$ circles, and after that she proceeds towards the south for the same length of time. From this it follows that, while the sun has 184 different circles to describe, the moon has fifteen such circles only. At the beginning of the yuga she leaves the outermost circle and begins her uttaráyana, describes the thirteen circles intermediate between the outermost and the innermost ones and enters into the fifteenth (innermost) circle, through $\frac{13}{67}$ parts of which she passes. After that the sidereal half moon has elapsed, and the moon has to retrace her steps towards the south. She therefore leaves the innermost circle unfinished, returns into the next one, passes again through the 13 intermediate circles and enters into the 15th (outermost) circle. After she has passed through $\frac{13}{67}$ parts of the latter, the sidereal half moon is again over and the progress towards the north recommences. Thus the moon moves in 15 circles of different diameter, but only 13 she passes through in their entirety while a fractional part only of the two exterior circles are touched by her. We have seen above that the vikampa-kshetra of the sun, *i. e.*, the extent to which the sun moves sideways in his northern and southern progress is estimated at 510 yojanas ($= 183 \times 2\frac{48}{61}$; the latter quantity being the amount of the daily vikampa); the vikampa-kshetra of the moon is estimated at nearly the same amount, *viz.*, $509\frac{53}{61}$ yojanas (it has been already remarked that the inclination of the moon's path to the ecliptic is not known to the Súryaprajñapti). The diameter of the moon herself is estimated at $\frac{56}{61}$ yojanas, the interval between consecutive circles described by the moon at $35 + \frac{30}{61} + \frac{4}{7 \times 61}$ yojanas; the sum of these two quantities is $36 + \frac{25}{61}$

$+\frac{4}{7 \times 61}$, which multiplied by 14, gives the above stated amount $\left(509\frac{53}{61}\right)$ as the whole vikampakshetra during one lunar half month. Here—as likewise above with reference to the sun—the Súryaprajñapti does not directly speak of the diameter of the moon, but of the measure of the breadth of the circle described by the moon; but the two things come to the same. The manner in which the moon, after having completed one of her circles, passes over into the next one is not expressly detailed; we must imagine it similar to that of the sun.

In connexion with this account of the moon's motion, the Súryaprajñapti enters into a curious calculation, of no practical, and it can hardly be said any theoretical interest, which, however, may be mentioned here as a specimen of the accuracy with which the system is worked out into its minutest details. The question is raised: what circles are common to the sun and moon and how far are those of the moon's circles which belong to the sun also touched by the latter? As the moon's circles are elevated above those of the sun by the amount of eighty yojanas, strictly speaking not any circle is common to both; common to both are, however, said to be those circles of the moon which when projected upon the plane in which the sun describes his circles partially or entirely coincide with the latter. The vikampa-kshetras of the two being nearly equal, while 15 circles of the moon correspond to 184 circles described by the sun, the consequence is that the by far greater portion of the sun's circles do not coincide with the moon's circles, but fall into the wide intervals separating the latter, one from another. Thus for instance the first (innermost) circle of the sun coincides with the first circle of the moon, so that when both luminaries move in their innermost circles their distance from Mount Meru is equal; only the circle of the moon overlaps that of the sun by $\frac{8}{61}$ yojanas, this being the difference of the breadth of the circles described by the two (of the diameters of the two bodies). The next twelve circles of the sun all fall into the interval between the first and the second circle of the moon; for this interval (plus the overlapping $\frac{8}{61}$ of the first circle) amounts to $35 + \frac{38}{61} + \frac{4}{7 \times 61}$ yojanas, while the vikampa-kshetra of twelve solar circles amounts to $33\frac{27}{61}$ yojanas only. After that two yojanas are occupied by the interval between the 13th and the 14th solar circles, and then the fourteenth solar circle begins, which therefore partly coincides with the second lunar circle. By continuing these calculations for all lunar circles, it is

found that the first up to the fifth inclusive, and again the eleventh up to the fifteenth inclusive are "súrya-sammiśráṇi," *i. e.*, partly coincide with solar circles, while the sixth up to the tenth do not coincide with solar circles, the latter falling entirely into the intervals between the named lunar circles. To reproduce here all the details of the calculation would be purposeless.—That the preceding account of the moon's motion agrees with the ideas of the author of the Súryaprajñapti is to be concluded from the formulas given in different parts of the work for the performance of certain calculations. Thus for instance the question is raised, in what ayana and what circle each parvan takes place, *i. e.*, how many ayanas have elapsed at the different times when the moon enters into conjunction or opposition and in which of the fifteen circles she is moving just then. This question is answered by some ancient gáthás quoted in the commentary, according to which the calculation has to be made as follows. The constant quantity—the ध्रुवराशि—which is to be used for the calculation of each parvan, is equal to $1 + \frac{4}{67} + \frac{9}{31 \times 67}$, *viz.*, of one of the circles described by the moon. This quantity is of course easily found by the following consideration. The moon which describes in one yuga 1,768 circles describes in one parvan $\frac{1768}{124} = 14\frac{8}{31}$ circles and in one ayana $13\frac{13}{67}$ circles; the difference of these two quantities is the above mentioned constant quantity. The rule for finding the places of the parvans is now as follows: The way accomplished by the moon during one parvan being equal to the way accomplished during one ayana plus $1 + \frac{4}{67} + \frac{9}{31 \times 67}$ circles, take at first as many ayanas as the number of the parvan whose place is wanted indicates, multiply then the constant quantity by the number of the parvan, and if the result exceeds $13\frac{13}{67}$, deduct it from this latter quantity (which subtraction if necessary has to be repeated until the remainder is less than $13\frac{13}{67}$); as often as this subtraction is performed as many unities are to be added to the number of ayanas found above and—unless the subtraction leaves no remainder—one additional unity is to be added; add two to the remainder; the resulting sum will indicate the circle in which the moon stands at the parvan. Regarding this latter point it is to be remembered that the circles are to be counted from the innermost circle when the number of the parvan is an even one and from the outermost circle when it is an odd one. To illustrate this let us take one of the many examples given by the Commentator. Required the place of the moon at the fourteenth parvan. Multiply at first one by fourteen, that means: fourteen ayanas have elapsed

at the time. Then multiply $1 + \frac{4}{67} + \frac{9}{31 \times 67}$ by fourteen; the result is $14 + \frac{56}{67} + \frac{126}{31 \times 67} = 14 + \frac{60}{67} + \frac{2}{31 \times 67}$. This is the number of circles which the moon has passed through during fourteen parvans in addition to fourteen ayanas. As this number exceeds the number of circles passed through in one ayana $\left(viz., 13\ \frac{13}{67}\right)$, the latter number has to be deducted from it and one has to be added to the number of ayanas. So we see that the moon has performed 15 ayanas at the end of the 14th parvan. The remainder left after the above deduction shows the number of circles which the moon has passed through in addition to the 15 complete ayanas; in our case these amount to $1 + \frac{47}{67} + \frac{2}{31 \times 67}$. As there is an excess above 15 complete ayanas, we have according to the rule to add one to their number, *i. e.*, the parvan takes place in the sixteenth ayana. And since the moon enters at the beginning of the ayana into the second circle (the circles being counted from the innermost as well as the outermost) and since in our case the moon has completed more than one full circle, two has to be added to the number of circles found above in order to obtain the ordinal number of the circle in which the moon stands at the expiration of the 14th parvan. The full answer is therefore: the 14th parvan takes place in the sixteenth ayana, in the third circle (reckoning from the innermost circle), $\frac{47}{67} + \frac{2}{31 \times 67}$ of this circle having already been passed through. In the same manner the places of all other parvans may be easily found; the commentator gives the places of parvan I—XV; but it would serve no purpose to extract them here. What has been given will suffice to justify the hypothetical account of the moon's motion detailed above.

The question regarding the relative velocity of sun, moon and stars which is raised in the 15th book finds its answer in accordance with the general principles of the system. The apparent daily motion being considered as the real one, it follows that the nakshatras travel faster than the sun, and the sun again faster than the moon; the space passed through by each of these bodies during a month, day, muhúrta, etc. is calculated and exhibited in detail; we need, however, only remember that the sun describes in one yuga 1,830 circles, while the moon describes only 1,768 and the nakshatras—through whose circle the sun passes five times—describe 1,835. From these relations all special values can be easily derived. It is just mentioned—no details being given—that the planets (graha) travel faster than the sun and the stars (táráḥ) faster than the nakshatras. It is needless to discuss the former of these two assertions; the latter is of course

entirely indefensible and no reason leading to it can well be imagined. This is the only time that the stars—excluding the nakshatras—are mentioned in the Súryaprajñapti as far as we can judge from the commentary.

The next point to be considered is the information the Súryaprajñapti furnishes with regard to the nakshatras. Incidentally it has already been remarked that the number of the nakshatras is invariably stated as being twenty-eight, and that the nakshatras are as invariably treated as being of different extent. The particulars are as follows:

According to their extent or, to look at it from another point of view, according to the time during which sun and moon are in conjunction with them, the nakshatras are divided into four classes. Firstly, those with which the moon is in conjunction during one ahorátra = thirty muhúrtas; to this class belong Revatí, Aśviní, Kṛittiká, Mṛigaśiras, Pushya, Maghá, Púrvaphálguní, Hasta, Chitrá, Anurádhá, Múla, Púrváshádhá, Śravaṇa, Śravishṭhá, Púrvabhádrapadá. The one ahorátra for which the conjunction lasts may be expressed as $\frac{2010}{67}$ muhúrtas, the convenience of which expression will appear at once. The second division comprises those nakshatras which are in conjunction with the moon for half a nycthemeron = fifteen muhúrtas = $\frac{1005}{67}$ muhúrtas; to this division belong Śatabhishaj, Áśleshá, Bharaṇí, Jyeshṭhá, Árdrá, Svátí. To the third division belong those nakshatras with which the moon is in conjunction for one and a half nycthemeron = 45 muhúrtas = $\frac{3015}{67}$ muhúrtas; these nakshatras are Uttaráshádhá, Uttaraphálguní, Uttara-bhádrapada, Punarvasu, Viśákhá, Rohiṇí. The fourth division comprises one nakshatra only, *viz.*, Abhijit, with which the moon is in conjunction for $9\frac{27}{67} = \frac{630}{67}$ muhúrtas. We see now for what reason the time of conjunction has been expressed throughout in sixty-sevenths of a muhúrta; it was done for the purpose of obtaining homogeneous expressions for all nakshatras. At the same time these fractions furnish us with an easy means for calculating the time during which the sun is in conjunction with each nakshatra; for five revolutions of the sun occupying the same time as sixty-seven revolutions of the moon, we have only to replace the denominator of the above fractions by five. The result of this operation having been turned into nycthemera, we find as the expression for the time during which the sun is in conjunction with the nakshatras of the four divisions the four following terms: 13 days, 12 muhúrtas; 6 days, 21 muhúrtas; 20 days, 3 muhúrtas; 4 days, 6 muhúrtas.—According to the space the nakshatras occupy they are either samakshetra, occupying a mean (medium) field or apárdhakshetra, occupying

half a field or dvyardhakshetra, occupying one field and a half. There is no special name for the extent of Abhijit.

In connexion with this division of the nakshatras into different classes according to the space they occupy or the time during which they are in conjunction with the moon, there is another one referring to the time of the day or the night at which they enter into conjunction. This classification is, however, connected with considerable difficulties. It is nowhere clearly stated on the conjunctions of what particular month this division is based; that such a statement ought to have been given, appears from the consideration that the periodical month during which the moon passes through all nakshatras comprises 27 days plus $\frac{27}{67}$ days, and that therefore in the second, third, fourth, etc. months the times at which the moon enters into conjunction with the single nakshatras will all differ from the times of the first month. If for instance the moon at the beginning of the first month enters into conjunction with Abhijit in the early morning, she will at the beginning of the second month again enter into conjunction with it $9\frac{27}{67}$ muhúrtas later, that is, in the afternoon and so on. Other difficulties will appear from the following detailed reproduction of the Súryaprajñapti's account concerning this point. The nakshatras are either "púrvabhága" *i. e.*, such as enter into conjunction with the moon during the forenoon; or "páschádbhága" *i. e.*, such as enter into conjunction during the afternoon or "naktambhága" *i. e.*, such as enter into conjunction during the night or "ubhayabhága" which term will be explained further on. The nakshatras of the two first classes are the samakshetras, those of the third class the apárdhakshetras, those of the fourth class the dvyardhakshetras. It certainly does not appear why the samakshetras should enter into conjunction with the moon during the day only and the apárdhakshetras during the night only; in reality there is no connexion between the extent of a nakshatra and the time when the moon enters into it. Let us, however, follow the detailed statements about each single nakshatra. The first aphorism of the Súryaprajñapti appears to be "Abhijit and Śravaṇa are paśchádbhága samakshetra." To this the commentator rightly objects that Abhijit is neither samakshetra, since it occupies only $9\frac{27}{67}$ muhúrtas of the moon's periodical revolution, nor paśchádbhága, since at the beginning of the yuga the moon enters into conjunction with it in the early morning. At the same time he tries to obviate these objections by remarking that Abhijit is called samakshetra and paśchádbhága, because it is always connected with Śravaṇa to which both these attributes rightly belong, or that it may be called paśchádbhága with a view to conjunctions other than the

first one which may take place in the course of the yuga. But these both attempts at reconciling contradictions are very unsatisfactory. Howsoever this may be, the commentator goes on to explain that Abhijit and Śravaṇa, after having finished their conjunction with the moon, hand her over to Dhanishṭhá at evening (Abhijit-śravaṇo dve nakshatre sáyam-samayád árabhya ekám rátrim ekam cha sátirekam divasam chandreṇa sárddham yogam yuktaḥ etávantam kálam yogam yuktvá tad-anantaram yogam anuparivartayataḥ átmanaś chyávayataḥ yogam chánuparivartya sáyam divasasya katitame paśchádbhúge chandram dhanishṭhávyáḥ samarpayataḥ). For this reason Dhanishṭhá also is paśchádbhága. After having been in conjunction with it for thirty muhúrtas the moon enters Śatabhishaj at the time when the stars have already become visible (parishphuṭanakshatramaṇḍalávaloke); Śatabhishaj is therefore naktambhága. How Śatabhishaj enters into conjunction at night, while exactly one ahorátra before Dhanishṭhá has been said to enter into conjunction during the afternoon, is not explained. Śatabhishaj being apárdhakshetra, the moon remains in conjunction with it for fifteen muhúrtas only and enters on the next morning into conjunction with Púrva-proshṭhapada, which being samakshetra remains in conjunction during one whole ahorátra. On the following morning the moon enters Uttara-proshṭhapada, which therefore would be púrvabhága. But the matter is looked at in a different light, Uttara-proshṭhapada is dvyardhakshetra, *i. e.*, remains in conjunction for 45 muhúrtas. If we now deduct from this duration the fifteen first muhúrtas and imagine Uttara-proshṭhapada to be samakshetra, the conjunction of the moon with it—looked at as samakshetra—may be said to take place at night and in consequence one—the real—conjunction taking place during the day and the other—the fictitious one—taking place at night the nakshatra is called ubhayabhága (idam kilottarabhádrapadákhyam nakshatram uktaprakáreṇa prátaś chandreṇa saha yugam adhigachchhati, kevalam prathamán pañchadaśa muhúrtán adhikán apaníya samakshetram kalpayitvá yadá yogaś chintyate tadá naktam api yogo 'stíty ubhayabhágam avaseyam). Uttarabhádrapada remains in conjunction for one day, one night and again one day, on the evening of which the moon enters Revatí; Revatí is therefore paśchádbhága. After it has remained in conjunction for one nychthemeron the moon passes into Aśviní at evening time. Aśviní is therefore likewise paśchádbhága. From it the moon passes on the next evening into Bharaṇí, at the time, however, when the stars have become visible and night may be said to have begun; Bharaṇí is therefore naktambhága. Being at the same time apárdhakshetra, the moon leaves it on the next morning to enter Kṛittiká, which therefore is púrvabhága. On the next morning the moon enters Rohiṇí which is dvyardhakshetra and, on account of that, ubhayabhága. Mṛigaśiras which she enters forty-five muhúrtas

later at evening is paśchádbhága; Árdrá which enters into conjunction thirty muhúrtas later, at the time when the stars have come out, is naktambhága; Punarvasu into which the moon enters on the next morning, being dvyardha, is ubhayabhága. Pushya comes into conjunction on the evening of the following day and is paśchádbhága; Áślesha thirty muhúrtas later, when the stars have come out, and is naktambhága; Maghá and Púrvaphalguní into which the moon enters on the mornings of the two following days are púrvabhága; Uttara-phalguní which comes into conjunction on the morning after that is ubhayabhága, because it is dvyardhakshetra. Hasta and Chitrá enter into conjunction on the evenings of the two following days, before night has set in, and are therefore paśchádbhága. Then again follows one naktambhága nakshatra, *viz.*, Svátí which enters into conjunction after nightfall, and upon this a dvyardhakshetra and consequently ubhayabhága nakshatra, *viz.*, Viśákhá. Then Anurádhá paśchádbhága, after this Jyeshṭhá, apárdhakshetra and naktambhága, remaining in conjunction from nightfall to the morning only; after this two samakshetra and púrvabhága nakshatras, *viz.*, Múla and Púrváshádhá. And finally Uttaráshádhá, which enters into conjunction on the morning, is, however, as a dvyardhakshetra, reckoned among the ubhayabhága. It remains in conjunction for one nycthemeron and the following day, in whose evening the moon arrives at Abhijit whence she had started a (periodical) month ago.

The difficulties involved in all the preceding statements are increased by an assertion made in another chapter of the Súryaprajñapti, *viz.*, that no nakshatra always enters into conjunction with the moon at the same time of the day. This is indeed true, but it contradicts the preceding statements. It may be that this whole classification of the nakshatras according to the time of the day at which they enter into conjunction with the moon is a remainder of an earlier stage of knowledge, when the periodical month was supposed to last just twenty-seven days without an additional fraction, and when it therefore was possible to assign to each nakshatra one fixed hour at which it entered into conjunction during each periodical revolution of the moon. It is true that actual observation would speedily have shown the error of such an assumption, but this remark would apply to almost all hypotheses of the Indians of that period, and we may therefore suppose that in this point too the desire of systematizing prevailed during a certain period over the testimony of the eyes. Later on when the duration of the periodical month had become better known, the old classification lost its foundation entirely and ought to have been dropped; but through the force of custom it maintained its place and was justified some how, although not with the best success, as we have had occasion to observe above.

On the places of the nakshatras with regard to the moon we receive

the following information (X. 11). Six nakshatras, *viz.*, Mṛigaśiras, Árdrá, Pushya, Áśleshá, Hasta, Múla always stand to the south of the moon whenever she enters into conjunction with them. Twelve nakshatras—Abhijit, Śravaṇa, Dhanishṭhá, Śatabhishaj, Púrva-bhádrapadá, Uttara-bhádrapadá, Revatí, Aśviní, Bharaṇí, Púrva-phálguní, Uttara-phálguní, Svátí always stand to the north of the moon. Seven nakshatras—Kṛittiká, Rohiṇí, Punarvasu, Maghá, Chitrá, Viśákhá, Anurádhá—sometimes stand to the north of the moon entering into conjunction with them; sometimes, however, the moon enters into conjunction with them "pramardarúpeṇa" *viz.*, in such a manner that she passes right through them. To this class, the commentator remarks, some teachers holding an opinion different from that of the Súryaprajñapti add also Jyeshṭhá. Two nakshatras, *viz.*, the two Áshádhas stand at the time of conjunction either to the south of the moon or the latter passes right over them. Both these nakshatras consist of four stars each, two of which are situated inside, *viz.*, to the north of the fifteenth circle of the moon, while the two remaining ones are placed outside, *viz.*, to the south of the same circle. Now whenever the moon enters into conjunction with either of the two nakshatras, she passes right between the former pair of stars and may therefore be said to be in conjunction "pramardarúpeṇa." Finally one nakshatra, *viz.*, Jyeshṭhá, always enters into conjunction with the moon pramardarúpeṇa. Regarding the relation of the nakshatras to the fifteen circles of the moon, the following statements are made. Eight circles always are "undeprived" (avirahitáni) of nakshatras. The twelve nakshatras mentioned above, beginning with Abhijit, are in the first circle; in the third circle there are Punarvasu and Maghá; in the sixth, Kṛittiká; in the seventh, Rohiṇí and Chitrá; in the eighth, Viśákhá; in the tenth, Anurádhá; in the eleventh, Jyeshṭhá; in the fifteenth, Mṛigaśiras, Árdrá, Pushya, Áśleshá, Hasta, Múla and the two Ashádhás. For although the first six of the last mentioned class in reality move outside the fifteenth circle, they are—the commentator says—so near to it that they may be said to be in it. In order to form a right estimate of the meaning and the value of these statements, we must recall to our mind what has been remarked above about the Súryaprajñapti's theory of the moon's motion. The moon is supposed to proceed alternately towards the south and the north in the same way as the sun does, following—as the Súryaprajñapti seems to assume—the same path; that she in addition to the movement in declination has a movement in latitude, and that the points in which her orbit cuts the ecliptic are continually receding is ignored, theoretically at least, although it had been observed that the position of the moon with regard to some nakshatras is different at different times, that she sometimes passes on the north or south-side of a constellation and at other times moves right through it. Now comparing the particulars

with the information given about the position of the nakshatras in the Siddhántas, we find that the Súryaprajñapti agrees with the latter with regard to five out of the six nakshatras said always to stand south of the moon (Mṛigaśiras, Árdrá, Áśleshá, Hasta, Múla), the latitude of all of them considerably exceeding the highest latitude the moon ever reaches. The case lies differently with regard to Pushya, which according to the Siddhántas lies in the ecliptic, so that it almost appears as if the Pushya of the Súryaprajñapti were an altogether different asterism. From among the twelve nakshatras said to stand always north of the moon ten (Abhijit, Śravaṇa, Śraviṣṭhá, Púrva-Bhádrapadá, Uttara-Bhádrapadá, Aśviní, Bharaṇí, Púrva-Phálguní, Uttara-Phálguní, Svátí) may be identified with the nakshatras of the Siddhántas whose latitudes—excluding Abhijit—vary from 9° to about 39° north. Strange it is only that these nakshatras occupying a zone of about 21° breadth are said to be in one and the same circle of the moon, and still stranger that Abhijit too is classed among them, the latitude of the latter—if identical with the Abhijit of the Siddhántas—exceeding the latitudes of the other nakshatras, with which it is here thrown into one class, by about 30°. The Śatabhishaj and Revatí of the Siddhántas are situated in and close to the ecliptic; here too therefore we might doubt if the Súryaprajñapti denotes by these two names the same stars as the Siddhántas. The remaining nakshatras may be identified with those of the Siddhántas, the latitude of none of the latter much exceeding the greatest latitude reached by the moon; a considerable margin must of course be allowed for the inaccuracy of the observations on which the statements of the Súryaprajñapti are based. Quite unfounded is the statement about the moon always passing right through Jyeshṭhá; it looks as if it had originated at some period when one of the moon's nodes had about the same longitude as that asterism.

The order of succession of the nakshatras is treated in X. 1. Of five different pratipattis regarding this point the author details only one, *viz.*, that one according to which Kṛittiká stands first. The author of the Súryaprájñapti for his part calls Abhijit the first nakshatra, since according to his system at the beginning of the yuga on the day of the summer solstice early in the morning the moon which is full at that time stands in Abhijit. He therefore altogether abandons the principle, sometimes followed, according to which the enumeration of the nakshatras begins with that nakshatra in which the sun stands on the day of the vernal equinox; if he too had chosen this principle he would of course have begun his enumeration with Aśviní. It may here be mentioned by the way that the Súryaprajñapti does not occupy itself at all with the equinoxes, the name of which is not even mentioned in the whole work.

We now proceed to consider some specimens of the numerous cal-

culations, rules for the performance of which are contained in the Súryaprajñapti itself as well as in a great number of old karaṇa-gáthás quoted by the commentator; remarking at once that the rules contained in the gáthás presuppose exactly the same system as the rules of the Súryaprajñapti itself. A comparison of these calculations with those contained in the jyotisha-vedáṅga shows the extreme likeness and in many cases the complete identity of the two sets; a result which supplies another reason for looking on the Súryaprájñapti as—in all essential points—a fair representative of Indian astronomy anterior to the period of the Siddhántas. Several of these calculations have already been reproduced above incidentally; in the following a detailed account of the more important ones among those not yet touched upon will be given.

It appears that before the influence of Greek astronomy made itself felt in India, the division of the sphere into 27 or 28 nakshatras was the only one employed and that no independent subdivisions of the nakshatras were made use of. This want was, however, supplied by a simple transfer of the subdivisions of time to the nakshatras. In accordance with this principle the Súryaprajñapti divides the sphere into $819\frac{27}{67}$ muhúrtas, this being the duration of the periodical revolution of the moon, and allots to each nakshatra a certain number of muhúrtas according to its greater or smaller extent. Fixed subdivisions of the muhúrta such as are commonly met in Indian astronomical works are, however, nowhere employed by the author of the Súryaprajñapti; he apparently preferred to keep himself perfectly free from restrictions of this kind and uses throughout those fractions of the muhúrta only which were immediately suggested by the various calculations in hand. From the general nature of the yuga it is manifest at once which fractions will present themselves most readily; they are sixty-seconds and sixty-seventhś (62 = number of synodical months in a yuga, 67 = number of periodical months) and, whenever lunar months of both kinds enter into the calculations, sixty-seventhś of sixty-seconds.

One of the most important rules is that which teaches how to find the place of the moon on any parvan. In the following the details of the calculation furnished by the commentator will be stated in extenso, so that at least one complete specimen of computations of this kind may be exhibited.—If we wish to devise a rule for calculating the place of the moon in the circle of the nakshatras at any parvan, we must at first find the constant quantity—the dhruvaráśi—entering as a multiplicand into all calculations of this kind. This in our case is clearly the space passed through by the moon during the lunar month, or more simply, because entire revolutions which bring the moon back to the same place can be neglected, the excess of the lunar synodical month above the periodical

month. From what is known about the general constitution of the yuga this quantity is of course readily found to be equal to $66 + \frac{5}{62} + \frac{1}{62 \times 67}$. The commentator calculates this quantity as follows. If the sun performs during 124 parvans five complete revolutions, how much does he perform during 2 parvans (= one synodical month); answer: $\frac{5 \times 2}{124} = \frac{5}{62}$ rev. This therefore is the excess of the synodical month above the periodical one. In order that the division can be carried out, the $\frac{5}{62}$ rev. are turned into nakshatras by multiplying them by $\frac{1830}{67}$ (*i. e.* by $27\frac{21}{67}$, the duration in ahorátras of the periodical month or, if we like, the extent of the nakshatras; 27 entire nakshatras plus the fractional nakshatra Abhijit). Result of the multiplication $\frac{9150}{4154}$. Again—in order to turn the days or nakshatras into muhúrtas—the numerator is multiplied by 30. Result $= \frac{274500}{4154}$. This division being performed gives as result 66 muhúrtas. The remainder 336 is multiplied by 62 and the product again divided by 4154. Result $= \frac{5}{62}$ muhúrtas. The remainder—62—should again be multiplied by 67 (the fractions employed being throughout sixty-seconds and sixty-sevenths) and divided by 4154; but 4154 being itself $= 62 \times 67$, it is seen at once that the result is 1. Thus the whole quantity is $66 + \frac{5}{62} + \frac{1}{62 \times 67}$ muhúrtas. If now the place of the moon at any amávasyá or púrṇamásí is wanted, the above quantity has to be multiplied by the number of the parvan; for instance, by one if the moon's place at the first full moon after the beginning of the yuga is wanted. The product shows how far the moon at the time has advanced beyond the place she had occupied at the beginning of the yuga, if full moons are concerned, or beyond the place she had occupied at the new moon preceding the beginning of the yuga, if new moons are concerned, (the new moon immediately antecedent to the beginning of the yuga having been selected as starting-point for all calculations concerning new moons). So far the place of the moon is expressed in muhúrtas only; now in order to find from these the nakshatra in which the moon stands at the time, we should

have to deduct from the muhúrtas found the extent of all the nakshatras through which the moon has passed one after the other, until the sum would be exhausted. Thus, for instance, if we wanted to find the place of the moon at the third new moon after the beginning of the yuga, the constant quantity $66.+\frac{5}{62}+\frac{1}{62\times 67}$ would have to be multiplied by 3, so that we should have $198+\frac{15}{62}+\frac{3}{62\times 67}$ muhúrtas. Now the moon standing at the new moon preceding the beginning of the yuga in Punarvasu, of which she has still to pass through $22\frac{46}{62}$ muhúrtas, we should have to deduct this last quantity from $122+\frac{10}{62}+\frac{2}{62\times 67}$; from the remainder we should have to deduct 30 muhúrtas (the extent of Pushya); from the remainder again 15 (Áśleshá); again from the remainder 30 (Maghá), and so on, until in the end the fact of the remainder being smaller than the next following nakshatra would show that new moon takes place in that nakshatra.—In order, however, to shorten this somewhat lengthy process, certain subtrahends are formed out of the sum of the extent of several nakshatas, which materially alleviate the work by substituting one subtraction for a number of subtractions. Thus with reference to new moon—the subtrahend (śodhanaka) for Uttara-phálguní is said to be 172, for Viśákhá 292, for Uttara-áshádhá 442; *i. e.*, if from the product of the constant quantity by the number of the new moon 172 can be deducted, we see at once that the moon has advanced beyond Uttara-ashádháḥ; if 292 can be deducted, she has passed the limits of Viśákhá and so on. The subtrahends are not carried on from Punar-vasu beyond Uttara-áshádhá, but make a fresh start from Abhijit, apparently in order to make them available for the calculation of the places of the full moons too. Thus the subtrahend for Abhijit is 9 and a fraction, of Uttara-bhádrapadá 459, of Rohiṇí 309, of Punarvasu 399, of Uttara-phálguní 549, of Viśákhá 669, of Múla 744, of Uttara-ashádhá 819.

The places in which the different full moons of the yuga occur are found by an exactly similar proceeding; only all calculations have to start not from Punarvasu, but from the beginning of Abhijit where the first full moon which coincides with the beginning of the yuga takes place. The text enumerates the places of all full moons and new moons of the yuga at length, carrying in each case the calculations down to sixty-sevenths of sixty-seconds of muhúrtas. It is needless to reproduce these lists here in extenso, as any place wanted can be calculated with ease from the general rule given above.

The same result, *viz.*, to find the place of the moon on a given parvan is obtained by following another rule contained in some gáthás quoted by the commentator. Their purport is as follows. Multiply sixty-seven (the number of periodical revolutions which the moon makes during one yuga) by the number of the parvan the place of which you wish to find and divide this product by one hundred and twenty-four (the number of parvans of one yuga). The quotient shows the number of whole revolutions the moon has accomplished at the time of the parvan. The remainder is to be multiplied by 1830 (*viz.*, 1830 sixty-sevenths which is the number of nycthemera of one periodical month) or more simply by 915 (reducing 1830 as well as the denominator *viz.*, 124 by two). From the product (remainder multiplied by 915) deduct 1302, which is that part of a whole revolution which is occupied by Abhijit (Abhijit occupies $\frac{21}{67}$ days, but as this amount is to be deducted from the numerator of a fraction the denominator of which is 62, 21 is to be multiplied by 62; product = 1302). The portion of Abhijit, from which the moon's revolutions begin, is deducted at the outset, because it is greatly smaller than the portion of all other nakshatras and would disturb all average calculations. After it is has been deducted the remainder is divided by 67 × 62; the quotient shows the number of nakshatras beginning from Śravaṇa which the moon has passed through, in addition to the complete revolutions. The remainder is again multiplied by thirty, the product divided by 62; the quotient shows the number of muhúrtas during which the moon has been in the nakshatra in which she is at the time. And so on down to small fractions of nakshatras. The following is an example. Wanted the place of the moon at the end of the second parvan. Multiply 67 by 2; divide the product by 124. The quotient (1) indicates that the moon has performed one complete periodical revolution. The remainder (10) is multiplied by 1830 or more simply by 915 (see above); from the product (9150) the portion of Abhijit (1302) is deducted. The remainder (7848) is divided by 67 × 62 = 4154; the quotient (1) shows that after Abhijit the moon has passed through one complete nakshatra, *viz.*, Śravaṇa. The remainder (3694) is multiplied by 30; the product (110820) again divided by 4154; the quotient (26) shows that the moon has moreover passed through 26 muhúrtas of Śravishṭhá. By carrying on this calculation we arrive at the result that at the end of the second parvan the moon stands in Śravishṭhá, of which she has passed through $26 + \frac{42}{62} + \frac{2}{62 \times 67}$ muhúrtas.

Analogous calculations are made for the sun too. For instance, in what circle does the sun move at the time of each parvan? The rule here is very simple. Multiply the number of the parvan by fifteen (the number

of tithis of one parvan) and from the product deduct the number of avamarátras (excessive lunar days) which occur during the period in question. If the parvan occurs during the first ayana of the sun, the remainder immediately indicates the number of the solar circle which is in fact the same as the number of the civil day on which the parvan happens; if the parvan takes place during one of the other nine ayanas, the remainder must at first be divided by 183 (number of circles described by the sun during one ayana); etc. The rule is simple and needs no illustration.

The rule for finding the nakshatra in which the sun stands at the time of each parvan (the súryanakshatra) is quite analogous to the rule given above for the moon. The sun makes in one yuga five complete revolutions, in one parvan $\frac{5}{124}$ revolutions. This quantity is to be multiplied by the number of the parvan and then we have as above to descend by continued multiplication and division to nakshatras, sixty-second parts of nakshatras and sixty-seventh parts of sixty-second parts. Instead of deducting the portion belonging to Abhijit at the beginning of which the moon stands on the first day of the yuga, we have to deduct that part of Pushya which the sun has not yet passed through at the beginning of the yuga; it amounts to $\frac{44}{67}$ of a nychthemeron. All the remainder of the calculation is the same as in the moon's case and illustrative examples are therefore not wanted.

Besides there is another and considerably simpler method for finding the sun's place at the end of a parvan; it is likewise contained in some old karaṇa-gáthás. The rule again assumes a "dhruvaráśi", a constant quantity, to be used in all calculations of this kind. This quantity is $33 + \frac{2}{62} + \frac{34}{62 \times 67}$ muhúrtas; for if we divide the whole circle of the nakshatras into $819\frac{27}{67}$ muhúrtas (which is the time occupied by a complete revolution of the moon) the above amount expresses the way the sun accomplishes during one parvan. This quantity has therefore to be multiplied by the number of the parvan required, and by subtracting from the product at first the $19 + \frac{43}{62} + \frac{33}{67 \times 62}$ muhúrtas belonging to Pushya, after that the 15 muhúrtas of Áśleshá, after that the 30 muhúrtas of Maghá etc., we find in the end the nakshatra in which the sun completes the parvan. In order to facilitate these somewhat lengthy subtractions, the muhúrtas of a certain number of nakshatras are again added and presented in a tabular form. So for instance 139 muhúrtas (19 + 15 + 30 + 30 + 45) lead us up to

the end of Uttara-phálguní, and if therefore the product found in the manner shown above exceeds 139, we may at once subtract 139 instead of performing five separate subtractions and know that the sun has at the time passed beyond Uttara-phálguní. The procedure is analogous to the one described above and needs no further illustration.

For finding how many seasons have elapsed on a certain tithi, the commentator quotes some gáthás of the old teachers. The rule they contain is as follows Multiply the number of the parvans which have elapsed since the beginning of the yuga by fifteen, and add to the result the number of tithis which have elapsed in addition to the complete parvans; deduct from this sum its sixty-second part; multiply the remainder by two and add to the product sixty-one; divide the result by one hundred and twenty-two; the quotient shows the number of seasons elapsed (which when exceeding six will have to be divided by six, since so many seasons constitute a solar year); the remainder divided by two shows the number of the current day of the current season. This rule seems not very well expressed, although it may be interpreted into a consistent sense. At first it must be remembered that the yuga does not begin with the beginning of a season, but with the month śrávaṇa, while the current season—the rainy season—has begun a month earlier with áshádha. The calculation would hen, strictly expressed, be as follows. Take the number of parvans which have elapsed since the beginning of the yuga, add to it the tithis which have elapsed of the current parvan and add again to this sum $30\frac{1}{2}$ tithis (the tithis of áshádha plus half a tithi of the month preceding áshádha) and deduct from this sum its sixty-second part, *viz.*, the so-called avamarátras, *i. e.*, the lunar days in excess of the natural days (according to the Súryaprajñapti's system each sixty-second tithi is an avamarátra). The remainder of the calculation needs no explanation; the formula enjoins the addition of 61 instead of $30\frac{1}{2}$ and division by 122 instead of 61 (the number of days of a season) in order to get rid of the fractional part of $30\frac{1}{2}$.

In order to find the number of the parvan during which an avamarátra occurs and at the same time the tithi itself which becomes avamarátra, the following rule is given. The question is assumed to be proposed in the following manner. In what parvan does the second tithi terminate while the first tithi has become avamarátra, or in what parvan does the third tithi terminate while the second is avamarátra? and so on, (kasmin parvaṇi pratipady avamarátríbhútáyám dvitiyá samáptim upayáti, etc.) The answer is: if the number of the tithi which becomes avamarátra is an odd one, one has to be added to it and the sum to be multiplied by two; the result shows the number of parvans elapsed before the first tithi becomes avamarátra. If the number is an even one, one is added to it, the sum multiplied by two, and to the product thirty-one is added; the result again shows the

the end of Uttara-phálguní, and if therefore the product found in the manner shown above exceeds 139, we may at once subtract 139 instead of performing five separate subtractions and know that the sun has at the time passed beyond Uttara-phálguní. The procedure is analogous to the one described above and needs no further illustration.

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number of parvans elapsed. Thus for instance if it is asked: when does the first tithi become avamarátra? add one to one (number of the tithi) result two; this multiplied by two gives four; therefore pratipad is avamarátra in the fifth parvan, after four parvans have elapsed. Or again it may be asked: when does the second tithi become avamarátra? add one to two; result three; this multiplied by two gives six, to which thirty-one are added. The result—thirty-seven—shows that in the thirty-eighth parvan the second tithi is avama-rátra. Thus all the avama-rátras for the first half of the yuga are found and the same numbers recur during the second half. The rationale of this rule is obvious.

A simple rule is given for finding the tithis on which the ávṛittis of the sun, *i. e.*, the solstices take place. Multiply the number of the solstice whose date you wish to know by 183 and add to the result three plus the number of the solstice; divide this sum by fifteen; the quotient shows the number of parvans elapsed, the remainder the number of the tithi of the current parvan. This rule—being based on the relation of tithis to sávana days needs no explanation. The following list for the whole yuga results from these calculations.

1st Summer solstice (= 10th solstice of the preceding yuga).

1st Winter solstice,	1st dark half of śrávaṇa.
2nd S. S.,	7th „ „ „ mágha.
2nd W. S.,	13th „ „ „ śrávaṇa.
3rd S. S.,	4th light half of mágha.
3rd W. S.,	10th „ „ „ śrávaṇa
4th S. S.,	1st dark half of mágha.
4th W. S.,	7th „ „ „ śrávaṇa.
5th S. S.,	13th „ „ „ mágha.
5th W. S.,	4th light half of śrávaṇa.
	10th „ „ „ mágha.

The places which the sun occupies in the circle of the nakshatras at the time of the solstices have been mentioned before; the places of the moon at the same periods can of course be easily calculated when it is remembered that at the beginning of the yuga the moon just enters Abhijit. It is unnecessary to reproduce here the rule given for that purpose; it may only be mentioned that the $\frac{7}{10}$ of a sidereal revolution which the moon performs during one solar ayana in excess of six complete revolutions constitute the "dhruva rási" for our case. The Súryaprajñapti likewise states the places in which the lunar ávṛittis take place; from the circumstance that at the beginning of a yuga the moon is full in the first point of Abhijit and at the same time commences her progress towards the north, it follows

that her next progress towards the south takes place exactly on the same spot on which the sun was standing at the beginning of the yuga. At all following lunar ávṛittis the places of the two first ones of course recur.

Incidentally another rule is mentioned which certainly was of frequent application, *viz.*, how to find on what natural day and at what moment of time during that day a given tithi terminates. The rule which is contained in an old karaṇa-gáthá is of course very simple. Add together all tithis which have elapsed from the beginning of the yuga up to and including the tithi in question; divide this sum by sixty-two; multiply the remainder by sixty-one and divide again by sixty-two. The remainder is then the wanted quantity. The first division by sixty-two has the purpose to shew by its quotient—the number of complete avamarátras elapsed since the beginning of the yuga; this number has therefore to be deducted from the number of tithis elapsed. The remainder of the above division shows the number of tithis which have elapsed since the occurrence of the last avamarátra; to find by how much they remain behind the same number of natural days, they are multiplied by 61 and divided by 62 (61 natural days = 62 tithis); the remainder then indicates how many sixty-second parts of the current natural day have elapsed at the moment when the tithi in question terminates.

Another old rule has the purpose of teaching how to find the number of muhúrtas which have elapsed on the parvan-day at the moment when the new parvan begins. When the number of the parvan divided by four yields one as remainder (in which case it is called kaly-oja) we must add ninety-three to it; if divided by four it yields two (in which case it is called dvápara-yugma), we add sixty-two to it; if it yields three (tretá-oja), we add thirty-two; if there is no remainder (kṛita-yugma), we add nothing. The sum which we obtain in each case is halved, then multiplied by thirty, finally divided by sixty-two. The quotient shows the number of muhúrtas of the parvan-day which have elapsed at the moment when the new parvan begins. The rationale of this rather ingenious rule is as follows. The duration of one parvan is $14\frac{94}{124}$ days. The first parvan therefore terminates when $\frac{94}{124}$ of the day $= \frac{94 \times 30}{124} = \frac{47 \times 30}{62}$ muhúrtas have elapsed. The number 94 may be obtained by adding 93 to 1, the number of the first parvan. The second parvan ends $29\frac{64}{124}$ days after the beginning of the yuga; 64 equals 62 + 2, the number of the second parvan. The third parvan terminates $44\frac{34}{124}$ days after the beginning of the yuga; 34

equals 31 + 3, the number of the third parvan. The fourth parvan terminates 59 $\frac{4}{124}$ days after the beginning of the yuga; 4 without any addition is the number of the parvan. The fifth parvan again terminates 73 $\frac{98}{124}$ days after the beginning of the yuga; 98 is equal to 93 + 5, the number of the parvan. And so on through the whole yuga.

The above examples fairly represent the more important rules contained in the Súryaprajñapti. Now it will be apparent to every one who is to some extent familiar with the Jyotisha-vedánga* that the rules contained in the, as yet partly unexplained, verses of the latter refer to calculations exactly analogous to those contained in the Súryaprajñapti and the old gáthás quoted by the commentator.

From this it might be concluded that it is now easy for us to explain whatever has up to the present remained unexplained in the Vedáñga, possessing as we doubtless do a clear insight into the general nature of the calculations for which it furnishes rules. But close as the connexion between the contents of the two treatises manifestly is, there are two reasons which preclude the direct application of the rules of the Súryaprajñapti to the elucidation of the Vedáñga. In the first place the Vedáñga divides the sphere into twenty-seven nakshatras only and, as far as has been ascertained up to the present, these twenty-seven nakshatras are considered to be of equal extent; while as we have seen above the Súryaprajñapti throughout employs the division of the sphere into twenty-eight nakshatras of unequal extent. In the second place the starting point for all calculations (*viz.*, the places of the winter and summer solstice) is not the same in the two works. The consequence of these two fundamental discrepancies is that although the questions treated of are essentially the same and although the modes of calculation are strictly analogous the results arrived at in the two treatises necessarily differ in all cases, that for instance the place of a certain full or new moon during the quinquennial yuga can never be the same according to the Súryaprajñapti as it is according to the Vedáñga, etc. Nevertheless it is highly probable that somebody who should apply himself to the study of the obscure portions of the Vedáñga after having made himself thoroughly conversant with the contents and methods of the Súryapra-

* Since the publication of the paper on the Jyotisha-vedáñga in the 46th volume of this Journal, the writer has received some very important contributions to the explanation of the Vedánga from Dr. H. Oldenberg, the well-known editor of the Vinayapiṭakam, who working altogether independently had succeeded in explaining a number of hitherto obscure rules. The writer intends to revert to the Vedánga before long and will then avail himself of the new results most kindly placed at his disposal by Dr. Oldenberg.

jñapti, would succeed in solving some more of the riddles presented to us by the former work.

It must be remembered that there is no indissoluble connexion between that part of the system of the Súryaprajñapti, which might be called the chronometrical one, *viz.*, the doctrine of the quinquennial yuga and its various subdivisions and that part which propounds the theories accounting for the apparent motions of the sun and the moon; it might therefore be that the Vedáñga agrees with the Súryaprajñapti only in the former point and follows a different course with regard to the latter. There occurs, however, one expression in the Vedáñga which makes it appear likely that the analogy between the two books extends to the second point also, *viz.*, the "súryamaṇḍaláni" mentioned in verse 22.

अतीतपर्वभागेभ्यः शोधयेद् द्विगुणं तिथिम्।
तेषु षष्ठ्यंशभागेषु तिथिनिष्ठां गतो रविः॥

It certainly looks as if by these "sun circles" in which the sun is said to be at the end of a tithi, we had to understand daily circles of the same kind as those which, according to the Súryaprajñapti, the sun describes round Mount Meru.

A few words may here be added on the principal feature common to the cosmological systems of the Puráṇas, Buddhists and Jainas, *viz*, the doctrine of sun, moon and constellations revolving round Mount Meru. In order rightly to judge of these conceptions we must remember that they arose at a time when the idea of the sphericity of the earth had not yet presented itself to the Indian mind, at a time (—if we may assume that the Puránic-Buddhistic cosmological system is not later than the period of the rising of Buddhism—) when this then truly revolutionary idea first suggested itself to the early Greek philosophers. And if we carry our thoughts back to that early stage of the development of scientific ideas and try to realize the conceptions which then were most likely to present themselves to enquirers, the old Indian system will lose much of its apparent strangeness and arbitrariness. How indeed could men ignorant of the fact that the earth is a sphere freely suspended in space explain to themselves the continually recurring rising and setting of the heavenly bodies? what could their ideas be regarding the place to which sun and moon went after their setting, and the path which unseen by man they followed so as to return to the point of their rising? Certainly the difficulty was a very great one to those as well who had some vague notion about the earth extending in all directions to an unlimited distance as to those who imagined it to be bounded at a certain distance by a solid firmament surrounding and shutting it in on all sides. We may recall, as one of the fancies to which the difficulty of this question gave rise, the old poetical idea, pre-

distance.—On the other hand it is true enough that, notwithstanding these similarities of Indian and Greek ideas, books of the nature of the Súryaprajñapti serve clearly to show the difference of the mental tendencies of the two nations. Both in an early age conceived plausible theories, in reality devoid of foundation, by which they tried to account for puzzling phenomena; but while the Greeks controlled their theories by means of continued observation of the phenomena themselves and replaced them by new ones, as soon as they perceived that the two were not in harmony, the Hindus religiously preserved the generalisations hastily formed at an early period, and instead of attempting to rectify them, proceeded to deduce from them all kinds of imaginary consequences. The absurdity of systems of the nature of the Jaina system lies not in the leading conceptions—these can as a rule be accounted for in a more or less satisfactory manner—but in the minute detail into which the followers of the system have without scruple and hesitation worked it out.

Before this paper is brought to a conclusion, the writer wishes to draw attention to the—in his opinion very striking—resemblance which the cosmological and astronomical conceptions, contained in an old Chinese book, bear to the early Indian ideas on the same subject, more particularly to the Jaina system as expounded in the Súryaprajñapti. The Chinese book alluded to is the Tcheou-Pei of which a complete translation was published for the first time by Edward Biot in the Journal Asiatique for 1841, pp. 592—639. It consists of two parts of different ages; the first part which apparently is of considerable antiquity, has been known since the time of Gaubil, who inserted a translation of it into his history of Chinese astronomy, published in the Lettres éd fiantes; that part, as is well known, shows that the ancient Chinese were acquainted with the theorem about the square of the hypothenuse of a right-angled triangle. The second and more recent part, which E. Biot thinks cannot be later than the end of the second century of our era, contains a sort of cosmological and astronomical system, and here the traits of resemblance alluded to above are to be found. As the arrangement of topics in the Tcheou-Pei is by no means systematic, so that it is not easy to form a clear conception of the essential points, a short abstract of the work, as far as it lends itself to a comparison with the Jaina system, is given in the following.

According to the Tcheou-Pei the sun describes during the course of the year a number of concentric circles of varying diameter round the pole of the sky. On the day of the summer solstice the diameter of this circle is smallest; it then increases during the following months, up to the day of the winter solstice when it reaches its maximum. Beginning from this day the solar circles again decrease, until on the day of the next summer

solstice they have reached the original minimum. On the day of the winter solstice the diameter of the solar circle amounts to 476,000 li (the li is a certain Chinese measure of length); its circumference to 3 × 476,000 = 1,428,000 li. The corresponding numbers for the circle, described on the day of the summer solstice, are 238,000 and 714,000. Between the innermost and the outermost circle there lie five other circles, which the sun describes in the months intervening between the two solstices, so that there are altogether seven circles; the six intervals between these are said to correspond to the months of the year (2 × 6 = 12). So it appears that the Tcheou-Pei assumes separate solar circles for each month only, not for each day. Each circle is at the distance of 19,833⅓ li from the two neighbouring circles.

The terrestrial place for which all the calculations of the Tcheou-pei are made is said to have such a situation that it is distant 16,000 li from the spot lying perpendicularly under the sun on the day of the summer solstice and 135,000 li from the spot lying perpendicularly under the sun on the day of the winter solstice; the distance of the place of observation from the pole, *i. e.*, the spot at the centre of the earth which lies perpendicularly under the celestial pole, is said to amount to 103,000 li. Round the terrestrial pole there extends a circle of 11,500 li radius, which is the terrestrial counterpart of the circle described by the polar star round the celestial pole. The light of the sun extends 167,000 li in each direction, so that on the day of the winter solstice when the sun moves in the exterior circle it extends at midday only 32,000 li beyond the place of observation and so does not reach up to the polar circle. On the days of the two equinoxes when the sun is moving in the fourth circle—the diameter of which amounts to 357,000 li—the rays of the sun just reach up to the polar circle. On the day of the summer solstice when the sun moves in the interior circle his rays reach beyond the pole to the extent of 48,000 li, so that then the whole polar circle is continually illuminated. When the sun in his daily revolution has reached the extreme north point, it is midday in the northern region and midnight in the southern region; when he has reached the east point, it is midday in the eastern, midnight in the western region; when he has reached the south point, it is midday in the southern, midnight in the northern region; when he has reached the west point, it is midday in the western, midnight in the eastern region. As the light of the sun always reaches 167,000 li each way, we must add 2 × 167,000 to the diameter of the circle, described on the day of the winter solstice, in order to obtain the diameter of the circle representing the outmost limit reached by the rays of the sun; the diameter of this circle is therefore 810,000 li.

On the day of the winter solstice the space illuminated by the sun

stands to the space not reached by his rays in the relation of three to nine; this proportion is to be reversed for the day of the summer solstice. The day of the winter solstice is the shortest during the year; the day of the summer solstice the longest. On the day of the winter solstice the shadow of the gnomon is 13·5 feet long; beginning from this day it goes on diminishing by equal quantities during equal spaces of time up to the day of the summer solstice when its length is reduced to 1·6 feet. It then increases again in the same uniform manner up to the day of the next winter solstice.

The circumference of the sky is divided into twenty-eight stellar divisions of unequal extent, through the circle of which sun and moon are performing their revolutions. Kien-nieou is the asterism in which the sun stands at the winter solstice; Leou the asterism of the vernal equinox etc. A procedure is taught how to find the place of the sun at any time. The whole circle of the asterisms is divided into 365¼ degrees corresponding to the number of the days of the year. A year is the period which the sun requires for returning to the same star from which he had set out. The meeting of sun and moon constitutes a month. A period of nineteen years of 365¼ days each contains 235 lunations. Arithmetical rules are given how to find the place of the moon at the beginning of each year etc.

The Tcheou-pei contains some additional matter about observations of the polar star etc., but by far the greater part of the topics it treats have been touched in the above summary. The similarity of this system and the old Indian systems particularly, as far as some details are concerned, the Jaina system is obvious. The same supposition is made use of in both to account for the alternating progress of the sun towards the north and the south. In the Jaina system the sun revolves round Mount Meru, in the Chinese system, to which the idea of a central mountain seems to be foreign, round the pole of the sky; Mount Meru finds, however, a curious counterpart in the Chinese polar circle, the projection of the circle described by the polar star. Both systems state the dimensions of the circles described by the sun; both state in figures the extent to which the rays of the sun reach. Both hold the same opinion about the alternation of day and night in the different parts of the earth. Both are interested in finding out what places sun and moon occupy in the circle of the nakshatras. Both teach the increase of the shadow by an equal quantity in each month. On the other hand there are important points in which the two systems differ. The Chinese appear from comparatively ancient times to have had a knowledge of the fact that the approximate duration of the solar year amounts to 365¼ years and that a period of nineteen years comprises 325 lunations. This of course makes the system of the Tcheou-pei to differ from the Jaina system in all those details which depend on the fundamen-

tal period and the advantage is of course altogether on the side of the Chinese. On the whole the Tcheou-pei is much superior to works of the stamp of the Súryaprajñapti, as in midst of all the fantastical and unfounded ideas it contains there are found some positive elements, observations of stars which admit of control etc., features altogether absent in the Súryaprajñapti. But in spite of these points of difference the similarities of the two works remain striking, especially if we take as one member of the comparison not the Súryaprajñapti itself but some hypothetical older work of the same class, less elevate and more moolerate in the statement of dimensions, figures etc. That such works if not existent at present must have existed at same earlier period is manifest from the remarks the Súryaprajñapti in many places makes about the opinions of other teachers, several of which have been extracted above. That two different chronological periods, the quinquennial yuga and so called Metanic cycle, from the foundation of the two systems does after all not interfere very much with their similarity. We might imagine the Jainas adopting the more correct cycle of nineteen years instead of the quinquennial one and work out all the new details necessitated by such a change, calculate all the places of moon and full moon during nineteen years instead of five etc., nevertheless the new system would immediately suggest the idea of the old one. An essential feature in the resemblance of the Chinese and the Hindu system is more over the circumstance of both limiting themselves to the treatment of a certain number of topics. The following paragraph of the Tcheou-pei (p. 603) which shortly states the questions to be treated in the work, might with hardly any change be taken as a summary of the contents of the Súryaprajñapti.

"I have heard people speak of the knowledge of the great man. I have heard it said that he knows the height and the size of the sun, the extent which his light illuminates, the quantity by which he moves in the course of one day, the quantity be which he recedes and approaches, the extent which the eye of man embraces, the position of the four extreme (cardinal) points, the divisions of the stars arranged in order, the breadth and length of the sky and the earth."

The question whether the similarity of the two systems justifies us in assuming a historical connexion between the two or would be an interesting one, but cannot be treated in this place, especially as its solution could only be attempted together with the solution of a number of cognate problems.

Coins supplementary to Thomas' "Chronicles of the Pathán kings of Delhi."—*By* Chas. J. Rodgers. (With a Plate.)

Steady research is always followed by constant results. These results are as a rule insignificant discoveries which are individually small, but collectively they all go to swell the sum of human knowledge. In my last small supplement to Thomas' "Chronicles of the Pathán kings of Delhi" I promised to give some additions which I had then in hand. But as I went on with two other papers and my researches for them, I found that incidentally my matter for the second supplement grew more interesting, and at last I found to my surprise that I had more coins in hand than would fill two plates; so I began to draw at once and simultaneously to put away for a third supplement all coins for which I could not now find a place. Strange to say just as I had made up my mind about these plates a find of about 500 coins of five Ghazni kings, all struck at Lahore, came to hand, some quite new and unpublished, and after that a batch of silver coins of Ala-uddin Khwárizmí of whose coins I gave three new types in my first supplement and of whose I give one great beauty in my present paper. These silver coins were struck at *Ghazní* and *Farwán* or as Thomas calls it '*Perwán.*' He gives no drawings of them and only alludes to them as giving us the mint of Perwán. These Ghazní kings' and the Khwárizmí king's coins must stand over for the present. I scarcely dare make a promise about them. About a year ago I came across a find of Ghazni coins, in number about 500, and up till now I have had no time to work at them and say what was in them, although there were several novelties of historic value. As I personally go to the bazars I see for myself what comes into them. And when I see what comes into them and what finds a lodgement in our museums, I am astonished and dumb-foundered to think that coins of whose existence we are unaware are daily being brought in from the villages and fields and ruins which abound here and there in the country and are simply handed over to the smelting pot as common silver,—bullion in fact which is purchased at a little less than its intrinsic value. And all this, while there is in India no Imperial Cabinet of Coins and no one appointed to collect for it and arrange it and make it a thing worthy of the historical associations, India as an Empire and as a collection of ancient kingdoms and states, possesses. India is a continent: but it is too poor to possess one Imperial Cabinet of coins which would serve as a metallic record of past emperors and rulers, past glories and shames, in fact, which would be a history of the past in metal manuscripts. With the present rage for melting down

everything it is high time something were attempted. Our only relics will soon be empty, worn out, burnt up smelting pots.

In the present supplement the coins I give are chiefly varieties of coins already known. The inscriptions are sometimes longer than those given in Thomas: sometimes they correct his readings; sometimes the coins reveal new mints, sometimes they are quite new types of coins.

Plate I, No. 1. Obv. *Tij ud daulat Khusrau Malik.*
Rev. Bull with new mark on its *jhúl.*

This coin is quite a new type of Khusrau Malik's coins.

No. 2. Obv. *(As sultán ul) Ażim Tij ud Daulat Khusrau Malik.*
Rev. Bull with new mark on its *jhúl.*

No. 3. Obv. *(Us sultán al) Ażim Rukn ud dunyá wa ud Dín Firoz (Sháh).*
Rev. Remains of a horseman and his steed.

Thomas gives three coins belonging to this king (Pl. I, fig. 24, 25, 26). I ascribe these three to Rezia. The *Rukn* is unmistakeable in my coin. I give in No. 4 a drawing of a coin I have, which is exactly like one of Thomas' (No. 24). A careful study of it will at once show that it reads Obv. "*Us sultán al Muazzim Rezia ud Dunyá wa ud Dín.*" Rev. Horseman and steed, exactly like Thomas'. In my coin the *zwád* (ض) is more fully developed and it must be a coin of Rezia's.

In Pandit Ratan Narain's list of coins I find a rupee of *Rukn ud Dín Firoz Sháh's.* Obv. *As sultán ul 'Ażim Shams ud Dunyá wa 'd Dín, abú 'l Muzaffar Rukn ud Dunyá wa 'd Dín Firoz Sháh.* Rev. *Fí ahd il Imám Al Mustansir, Amír ul Mominín, fí shahúr i san thaláth wa thaláthín wa sita mi'ata.* In this rupee the letters of *Rukn* are exactly as in my coin. It has no margins, the date is given in the square area. This rupee is quite unique. I should very much like to know its whereabouts. Such a coin should by no means leave the country. I may add that Ratan Narain gives in his list a copper coin like mine, and, being misled by Thomas, gives also two of Rezia's coins as Rukn ud Dín's. I have four coins of Rezia's of this kind, as well as four of the type I published in my last paper, and one each of Thomas' Pl. I, figs. 28 and 29. On comparing them I have no hesitation whatever in assigning Thomas' Pl. I, Nos. 24, 25, 26 to Rezia.

In my last paper I gave a coin of Sanjar and Bahrám Sháh. In it the title of *Muazzim* was given to Sanjar. In my present paper I give coins which shew that this title was given to several kings, who rejoiced however, as is shown by their numerous coins, in the title *al Ażim.*

No. 5. Obv. "*As sultán ul Muazzim, Alá ud Dunyá wa 'd Dín.*" Rev. Horseman and steed.

No 9. Obv. *As sultán ul Muazzim Eltatamsh as Sultán.* Rev. Horseman and steed and remains in Hindi of *Srí Hamírah.*

Plate II, No. 2. Rev. *Us sultán ul Muazzim.*

Obv. *Gyás ud Dynyá wa ud Dín.*

In these three coins Alá ud Dín (Masaud Sháh) and Shams ud Dín Altamsh and Gyás ud Dín (Balban) we have the title *Muazzim.* And it comes also in No. 6 which I now proceed to describe.

No. 6. Obv. in florid Kufic "*As sultán ul Muazzim Shams ud dunyá wa 'd dín Abú 'l Muzaffar* (*Eltamash ?*). Rev., in a rayed circle, the Kalimah, under which (*Al Mustansir*) *biamri 'llah Amír ul Mominín.* This coin weighs 62 grs. only. It is therefore a tankah. It came to hand with three *Bahá ud Dín Sám's* silver tankahs.

No. 7. A rupee of Shams ud Dín Altamsh.

Obv. "*As Sultán ul Azim Shams ud Dunyá wa 'd Dín Altamsh as Sultán Násir i Amír ul Mominín.*" Rev. *Fí ahd il Imám Al Mustansir Amír ul Momanín. Margin* illegible alas!

No. 8. Obv. in Hindí above bull, *Samasa Dín.*

Rev. above horse *Ha* and no other letter of Hamírah.

This type is quite new.

No. 10. Obv. *As Sultán ul Azim Shams ud Dunyá wa 'd Dín.*

Rev. Horseman, to right of which *Eltatamsh,* and above horseman *us Sultán.* Thomas' coin had not any inscription in front of the horse. I have seen several of this type.

No. 11. Obv. (*Shams*) *ud Dunyá wa* (*ud Dín*) *Eltatamsh as Sultán.*

Rev. Horseman and *Srí Hamírah.*

No. 12. Obv. *As sultán ul 'Azim Eltatamsh as sultán.*

Rev. Horseman at charge.

No. 13. Obv. *Shams ud Dunyá wa 'd Dín Abú 'l Muzaffar us Sultán.*

Reverse, not given.

These three coins Nos. 11, 12 and 13 give more than do Thomas' Nos. 47, 46, and 48. A comparison of them with Thomas' coins will at once show the additional information these supply.

No. 14. This is the same as Thomas' No. 50, with the addition of the word *as Sultán* on the obverse plainly visible.

Nos 15, 16, 17, 18 show at one view four types of coins of Elduz, the general of Muhammad bin Sám. Three of them are binominal.

No. 15. Obv. *Muizz ud Dunyá wa 'd Dín, Abd Yalduz.*

Rev. Bull over which "*Srí Muj,*" in Hindí.

There cannot be much doubt about the reading of the Hindí. Srí Hamírah it cannot be. It is an attempt I think by a Musalmán at *Srí Muizz.*

No. 16. Obv. *Muizz ud Dunyá wa 'd Dín.*

Rev. *Abd Yalduz.*

There are floral ornaments about the inscriptions.

No. 17. A similar coin to *Ariana* Antiqua, Pl. XX, fig. 18, but much fuller.

Obv. "*As Sultán ul Ázim Muizz ud Dunyá wa 'd Dín.*"

Rev. '*Abdu 'l Malik ul Muazzim, Táj ud Dunyá wa 'd Dín Yalduz.*

No. 18. Obv. "*As sultán ul Muazzim Abú' l Fath Yalduz as Sultán.*

Rev. Horseman with remnants of *Srí Hamírah* and Star underneath horse.

Plate II. No. I. Gold Mohur of Sher Sháh. Obv. in Mahrábí area "*As Sultán Sher Sháh, khallad Allah Mulkahu.*" Rev., in square area, the Kalimah. Both margins are illegible: this is a great pity, as the coin is in every other respect one of great beauty.

No. 3. Obv.—"*Sultán Sher Sháh, zarb i Sambhal.*" Margin obliterated. Rev. not given.

No. 4. Obv.—"*Sultán Sher Sháh, zarb i Alwar.*"

These are two new mints of Sher Sháh.

No. 5. Rupee of Sher Sháh. Circular areas on both sides. Obv. "*Sher Sháh Sultán, khallad Allah &c.*

Margin:—"*Farid ud Dunyá wa 'd Dín abá 'l Muzaffar*"

and in Hindí, *Sher Sháh*, and in Arabic figures 949. Rev. the Kalimah; Margin, the names of the four companions: and "*As Sultán ul Ádil, zarb Ujain.* This is also a new mint of Sher Sháh's.

No. 6. Rupee of Sher Sháh's: Square areas surrounded by double lines.

Obv. *Sher Sháh Sultán, khallad Allah mulkahu.*" Margin "*Farid ud Dunyá wa 'd Dín, zarb i Shergarh*, in Hindí "*Sher Sháhi.*"

Rev., kalimah in area. Margin, the names of the four companions and their titles. This coin has not been figured before. Unfortunately mine has lost a piece out of its centre and it has not been mended very cleverly. But the workmanship is very superior.

No. 7. Rupee of Kutub ud-Dín Mubárak Sháh. New type.

Obverse: "*Al Imám ul Ázim, Kutub ud Dunyá wa 'd Dín, Abú 'l Muzaffar, Khalífatu'lláh.*"

Rev. central area: "*Mubárak Sháh as Sultán, ibn us Sultán Al Wásiq billah, Amír ul Mominín.*"

Margin.—"*Zarb házá il Fizzat bi Hazrat dár il Khiláfat, Fí sanat, saba ashrata wa saba míata.*

This coin has on it exactly the same as Thomas' No. 146 But his is a square piece. On Mr. Delmerick's coin are similar inscriptions, with the mint place however termed "*dár ul mulk*," not "*dár ul khiláfat.*"

No. 8. Gold coin of Gyás ud Dín Tuglaq. This coin is the same as Thomas'-No. 158. In his coin the margin stops short when it gets to the mint. This goes on three words "*fi mulk i Tulang.*" It was struck in Telingana.

No. 9. A gold mohur. Rev. *Mahmúd Sháh, bin Muhammad Sháh bin Tuglaq Sháh as Sultán 752.*"

Obv. *Fí zaman i Amír ul Mominín, Gyás ud Dunyá wa 'd Dín, Abú 'l Muzaffar.*"

When Muhammad Tuglaq died, Fíroz Sháh was with him at Tatta in Scinde. Ahmad Ayáz Khwájah i Jahán set up in Dehli a boy of six years of age as king. Ferishta says that he was called Gyás ud Dín *Muhammad*, but the coin shows that his name was *Mahmúd*. On Fíroz Sháh's arrival in Dehli Mahmúd was deposed.

No. 10. New type of Alá ud Dín Khwárizmí's coin struck at *Kishm*. Obv. "*Kishm, Ala ud Dunya wa 'd Dín, Muhammad bin us Sultán.*" Rev. horseman by side of spear "*(A)mír.*" Above the horse "*ul Azim.*"

No. 11. Obv. "*(Saif) ud dunyá wa 'd Dín, Abú ul Muzaffar, al Hasn, bin Muhammad.*"

Rev. Bull on which "*Kirmán,*" over it in Hindí *Srí H?*"

No. 12. Obv. "*Násir ud dunyá wa 'd Dín, Abú 'l Muzaffar.*

Rev. "*Muhammad bin Hasn Karlagh.*"

No. 13. Obv. in Hindí round a bull "*Srí Jalál ud Dín.*" On the bull in Arabic "*Kirmán.*"

Rev. Horseman over which words which may be Hindí "*Srí Hamírah*, but they look like Persian "*Farmán rawá.*"

These last four coins are all new types. *Kirmán** may be the Persian province and town. Jalál ud Dín Khwárizmí went there by way of *Mekrán* after he left India. At least so says the author of the "*Rauzat us Safa.*"

No. 14. Obv. "*Khalífatu Rabb il Alamín Kutub ud Dunyá wa 'd Dín.*"

Rev. "*Abú 'l Muzaffar Mubárak Sháh as Sultán ibn us Sultán Al wásiq billah.*"

No. 15. Obv. "*Al Mujáhid fi sabíl i 'llah Muhammad Tuglaq.*" Above, "*Abubakr;*" to right, "*Alí;*" to left "*Umr*" under "*Othmán.*"

Rev. the Kalimah in a circle. Margin: "*Zarb házá us Sikka, bi Hazrat Dehlí, fi sanat Khams asharín wa saba míata.* This coin is a very

* Thomas identifies it with *Kurruna* near Bunnu. *Kishm* is I suppose the island and town at the entrance to the Persian Gulf. If so, there is no reason why *Kirmán* should not be the Persian one, except this one, that here we have coins struck in Hindí.

much better specimen than the one given in Thomas which was struck in *Dár ul Islám*." Thomas calls his *unique*, but I have one also struck at "Dár ul Islám," and during the last five years I have seen about half a dozen of them. *Dehlí* and *Dár ul Islám* were favourite mints of Muhammad Tuglaq, but I have coins of the type of No. 159 in Thomas that were struck at not only these two places, but at "*Takhtgáh i Dehlí*," "*Arsa i Satgáwn*," and at "*Iqlím i Tuglaqpúr urf* (known = *i. e.*) *Tirhut*." There are coins extant which were struck at *Daulatábád*. Thus there were six mints of this one type of coins. The simply *Dehlí* marked coins and the *Tuglaqpúr* and *Satgáwn* types have not yet been published. Thomas' No. 173 was struck at Dehli. The Lahore Museum possesses three similar gold mohurs. Of these, two were struck in 734 and one in 735 and all at *Satgáwn* in Bengal.

In Sir Alexander Burnes' "*Travels in Bukhara*" Vol. II, two plates of coins are given. This book was printed in 1834. Masson's researches in Afghanistán produced over 60,000 coins. From them Wilson compiled the Ariana Antiqua which contains 21 plates of coins, Grecian, Greco-Bactrian, Indo-Scythian, Sassanian and Indian. General Cunningham in his "Coins of the Successors of Alexander in the East" gives fourteen plates which deal only with Grecian and Greco-Bactrian coins. Late discoveries have produced so many new coins that a supplement equal in size to the original book might easily be published. The coins of each dynasty that has reigned in India supply matter enough for a volume. These coins are purchased by private individuals and of course kept in their cabinets, each new type being hailed with numismatic delight. When these private individuals go home, of course they take their acquisitions with them. So that private enterprise in Indian numismatics simply robs the country of its treasures. When a poor student wishes to see the coins about which he reads, he cannot do it. The museums have not got them. The Calcutta Museum is I am credibly informed destitute of coins. It seems to me there is only one way of meeting this difficulty. The Museums of India must have grants made to them for the purchase of coins just the same as Museums at home have. The Berlin museum gets everything good in Europe, simply because it gives good prices. Here in India those who can pay get the best coins. And if the Government of India desires that the museums should possess cabinets of coins, men must be appointed and money granted, or nothing will ever be done except opportunities lost.

I have shown above how our knowledge of the different kinds of coins has increased. What I desire to see is an increase in the number of coins in our museums.

Copper Coins of Akbar. By Chas. J. Rodgers, *Amritsar.*

(With two Plates.)

In this paper I propose first to make a list of the coins I have drawn in the two plates accompanying this paper and secondly to offer a few remarks which seem to suggest themselves from a study of the inscriptions on the coins.

No.	Wt. in grs.	
1	108	Obv. *Do tánke i Akbar Sháhí.* Rev. *Zarb i Ágrah, (Shahrewar ?)* 50 *Ilahí.*
2	109	Obv. *Do tánke i Akbar Sháhí.* Rev. *Zarb i Ágrah, Azr* 46 *Ilahí.*
3	59	Obv. *Yak tánke i Akbar Sháhí.* Rev. *Zarb i Láhor (?)* 46 *Ilahí.*
4	76	Obv. *Dám.* Rev. 33 *Ilahí.*
5	326	Obv. *Zarb i Fulús i Náynol.* Rev. *Fí san i Nuhsad wa shast,* 963.
6	318	Obv. *Zarb i Fulús i dár us saltanat, Ahmadábád.* Rev. *Fí san i Nuhsad wa hashtád wa shash.*
7	311	Obv. *Zarb i Fulús i Dehlí.* Rev. *Nuhsad wa hashtád wa yak.*
8	319	Obv. *Zarb i Fulús i Dár us saltanat, Fathpúr.* Rev. *Fí san i nuhsad wa hashtád wa nuh,* 989.
9	325	Obv. *Fulús i Dár us saltanat Láhor.* Rev. *Fí san i nuhsad wa hashtád wa haft,* 987.
10	314	Obv. *Zarb i Fulús i Hissár Firozah.* Rev. *Fí san i nuhsad wa nawad wa shash,* 996.
11	317	Obv. *Fulús i Dár ul Khiláfat, Lakhnau.* Rev. *Fí san i nuhsad wa hashtád wa nuh,* 989.
12	321	Obv. *Urdú Zafarfaría.* Rev. *Zarb i Fulús. Alif* = 1000 A. H.
13	317	Obv. *Zarb i Fulús i Láhore.* Rev. *Farwardín,* 39 *Ilahí.*
14	312	Obv. *Zarb i Fulús i Multán.* Rev. *Urd i bihisht,* 41 *Ilahí*
15	318	Obv. *Zarb i Ilahábás.* Rev. *San i,* 36 *Ilahí.*
16	308	Obv. *Zarb i Fulús i Dehlí.* Rev. *Farwardín,* 38 *Ilahí.*
17	315	Obv. *Zarb i Fulús i Urdú i.* Rev. *Zafarfarín,* 42 *Ilahí.*
18	327	Obv. *Zarb i (Gobi)ndpur, Sikka i Akbar Sháhí.* Rev. *Urd i Bihisht,* 46 *Ilahí.*
19	315	Obv. *Dokání ?* or *Dogánw ? Sikka i Akbar Sháhí.* Rev. *Urd i Bihisht,* 44 *Ilahí.*

No.	Wt. in grs.	
20	316	Obv. *Zarb i Fulús i Attak Banáras.* Rev. *Amr Dád*, 37 *Ilahi.*
21	295	Obv. *Zarb i Fulús i Láhor.* Rev. *Shahrewar*, 43 *Ilahí.*
22	39	Obv. *Zarb i Fulús i Láhor.* Rev. ——— 38 *Ilahí.*
23	37	Obv. *Zarb i Fulús i Nárnol.* Rev. *Nuhsad wa shast wa nuh.*
24	149	Obv. *Fulús i Kábul.* Rev. *San*, 33 *Ilahí.*
25	385	Obv. *Fulús.* Rev. *Urdú zafarfarín.*
26	140	Obv. *Zarb i Dár ul Khiláfat, A'grah.* Rev. *Fí san i nuhsad wa shast wa.*
27	40	Obv. *Damrí.* Rev. 33 *Ilahí.*
28	625·5	Obv. *Zarb i Dehlí, Sikka i Akbar Sháhí.* Rev. *Máh i zí*, 43 *Ilahí.*

28*a*. The space between the two lines shows the thickness of No. 28.

It will be at once seen that each of these coins with the exception of No. 26, has its own designation upon it. Thus Nos. 1 and 2 are called *do tánke* pieces; No. 3 is a *yak tánke* piece. No. 4 is a *dám*. Nos. 5—17 inclusive and Nos. 22—25 inclusive are *fulús* pieces. No. 27, is a *damrí*. Nos. 18, 19 and 28 are called *Sikka i Akbar Sháhí*. The term *fulús* is applied to coins varying from 37 to 326 grains, one struck at Kábul weighing 149. The word *falas* in Arabic means want, indigence, hence *fals* or *fils*, a small coin, an obolus, money given to relieve poverty, or small change or copper, as we say in English.* *Fulús* is the plural of *fals*. The first coin I have seen with *fulús* upon it is dated 946 A. H. It is evident that a term used so loosely as is this one could never have been brought forward in accounts or revenue statements.

Again the *sikka* has three weights 625·5 grains and 327 and 315 grs. I have three which I have not figured which weigh little more than 37 grains each. Hence *sikka* could not well be used as a definite value.

We have left the *dám*, *damrí* and *tánke*. We know that the last of these was a name applied to coins from the time of Mahmúd of Ghazni. We know also that *tánkes* were of two kinds, silver and copper. The weights of *tánkes* varied as did also their values. The *tánkes* of Sikandar Lodí were of different mixtures of silver and copper. Sometimes they contained only a little more than a grain and a half of silver in each, sometimes as much as eight grains and sometimes as much as sixteen, seventeen or even thirty-two. Hence it is evident that such coins could

* [This derivation is doubtful. For *fals* signifies a fish scale as well as a copper coin. Ed.]

not be used in revenue returns. It became incumbent on Akbar, therefore, when he made a demand from his ministers for revenue returns to fix a standard. The *yak tánke i Akbar Sháhí* seems to be such a standard value. In the *Aín i Akbarí* we are told that the *dám* was a coin of the value of five *tánkes*. And further we are told that there were forty *dáms* to the rupee. Hence we may judge that there were 200 *tánkes* to the rupee. Now the total revenues of Akbar are put down by Nizám-uddín at 640,00,00,000 *tánkes*. This at the rate of 200 to the rupee would be equal to 3,20,00,000 rupees or £3,200,000.

Now in our list of coins we have a *dám* which weighs only 76 grains. And Abúl Fazl gives Akbar's revenues as 5,67,63,83,383 *dáms*. Now if a coin of 59 grains is valued at 200 to the rupee, a coin of 76 grains would be worth about 160 to the rupee. According to this account Abúl Fazl's statement stands at about 3 krors 54 lacs of rupees or £3,540,000.

These statements are small compared with those arrived at by Thomas who makes the first equal to 32 millions and the latter to 16 millions, a discrepancy rather startling. And the magnitude of the sums is somewhat appalling. For when we turn to the prices of the produce of the land we are astonished to find that wheat sold for two maunds per rupee, barley at four maunds, mutton at about a fortieth of a rupee per lb. And we must remember that nearly all Akbar's revenues were from land.

Now if things sold so cheaply there must have been a vast amount of land under cultivation, in order to realize a revenue of £32,000,000, which is only a fractional part of the value of the whole of the crops. And India in those days must have been an enormously rich country, for Akbar had only a fraction of it in hand.

Thomas in his calculations does not give one coin of Akbar's. He gives statements from contemporary writers. These men were often wrong. Certainly five *yak tánke* pieces of 59 grains could not be equal to the *dám* of 76 grains.*

Akbar's copper coins seem to follow the copper coins of the Súrí dynasty. Sher Sháh put an end to a mixed currency. But on no one of Sher Sháh's copper coins have I as yet been able to find a coin-name.

Abúl Fazl's statement is for the year 1003 A. H. or Akbar's 40th year and Nizám-uddín's is for 1002 or for his 39th year. The *dám* I figure is for the 33rd year and the *yak tánke* piece is for the 46th year. It is quite possible that these values were those the authors had in view.

I leave this part of the subject. It is one of great importance and one on which authorities differ widely. If Akbar out of the portion of India which he conquered could realize three hundred years ago 32 millions sterling, he in fact realized more than the English Government of India now does. For if we take away from the revenue all the extra sources

* See note on page 191.

which have accrued to it since the time of Akbar we leave a much smaller amount for land revenue simple than that realized by the third Mogul. I strongly suspect that the whole of these returns are paper sums which were never realized.

Let us now look at some other features in the coins:—the mint towns claim a word. They are A'grah, Láhor, Nárnol, Ahmadábád, Dehlí, Fathpúr, Hissár Firozah, Lakhnau, Urdu Zafarfarín, Multán, Ilahábás, Gobindpur, Dogánw (?), Attak Banáras, Kábul, in all sixteen mints. I have in my cabinet some half dozen to-me-illegible mints more of Akbar. In the Lahore Museum is a great heap of Akbar's large copper *fulús*, as yet unarranged.

Nárnol is not given in Thomas, neither is Fathpúr or Dogánw or Gobindpúr. Fathpúr is Fathpúr Sikrí near Agrah. It rejoices in the title of Dár us Saltanat on both gold and silver coins of Akbar. I have one rupee of Sháhjahán struck at the same place. Attak Banáras is undoubtedly Attock on the Indus; for interesting remarks on this place I must refer the reader to General Cunningham's Archæological Survey Report, Vol. II, pp. 93, 94.

The years and months deserve notice. No sooner had Akbar proclaimed the change in the year than he began to strike coins according to his new system. The coins of the year 30 Ilahí are very rare indeed. I have two rupees of that year but no copper coins. (This was the year of the change.) Akbar reverted to Kalimah rupees after this. His square rupees with *alif* (= in Arabic 1000) are somewhat common. They all have the Kalimah on them. I have two square rupees of 1000 and 1001, with the date *in figures*, and with the Kalimah on them. The months also figure on the coins. Thus we have *Shahrewar*, *Azr*, *Farwardín*, *Urd i Bihisht*, *Amr Dád*, and *Zí*, or six months out of the twelve on the few copper coins here put forward. In rupees I have all the months. I am going to try to complete one year, having already of some years four months. I suppose the dies used must have needed constant replacing. Some of them were very sharp and deep and would soon be the worse for wear.

Of some places I have only figured one coin. I have several of most of them. Thus of Narnol I have four and five of 963, and one of an illegible mint of 966. The whole of the 50 years of Akbar's reign are I believe obtainable in all the metals, gold, silver and copper. I have every year in rupees, except 965. During the last five years I have come across many mohurs of different years. Some of these are of rare beauty. Systematic research ought to bring these to light. The British Museum has *dirhams* of the Khalifahs which go year by year from the commencement of their minting to the time when they ceased striking. And what makes these series the more interesting is the fact that each mint is thus represented year by year, sometimes for nearly a hundred consecutive years. In India, one

object to be had in view is a complete series of coins of all the Sultáns whether Pathán or Mogul, and of the Mahárájahs and Rájahs. Another object should be series of local mints. Thus Lahore, from the time of Mahmúd of Gazní to that of the latter Moguls, was a very famous mint town. But in the museum of that city no attempt has been made to secure complete series of Lahore coins. Those of the early Moguls are of great beauty and deserve to be gathered. The large mohurs and square rupees of Jahángír struck at Lahore are most especially worthy of notice. Of course the price of such coins would amount to a large sum. But if a museum is worthy of being kept up, surely the things in it should be worth looking at. The coins in the Lahore Museum are now being catalogued, and when the catalogue is issued, the deficiencies and redundancies of the collection will be seen at once. It is to be hoped that when the deficiencies are made manifest, some attempt will be made to make them good.

For coins Nos. 1 and 3, I am indebted to Dav. Ross, Esq., Traffic Manager, Scinde, Punjab and Dehli Railways for permission to make copies of them. For permission to draw No. 28, I am indebted to Mr. Ibbettson, C. S. of Kurnál.

With respect to the *fulús* coins I may add that these are probably the the coins of which Bernier says that Aurungzíb had bags of 1000 *peyssas* ready for distribution. In a loose fashion the term *dám* seems also to have been given to the large *fulús* pieces. And generally we see that with respect to Akbar's copper coins there was a want of definiteness which precludes the possibility of arriving at exactness with respect to his revenues. For we must always remember that copper was the standard of value in Akbar's time.

Note.—There is some confusion in the names of the copper coinage of the East India Company. Accounts are kept in rupees, annas and pies. There are 12 pies to an anna. But on the quarter anna we have in Persian distinctly يک پاي one pie. According to this therefore there are only four pies in an anna. The coin we call a pie has on it in Persian ثلث پاي *sulṣ pái*, the third part of a pie. If the accounts of the Company had been kept in pies only, there would have been tremendous confusion until the value of the pie had been fixed.

The modern pice weighs about 100 grains. Hence a rupee is worth about 6400 grains. If a *dám* weighed 320 grains and a rupee were worth forty *dáms* then in Akbar's time a rupee represented 12,800 grains. But if also the *dám* weighed 80 grains only, and there were 160 of them, the same result is arrived at. Now nearly the same result is arrived at with reckoning the rupee to be worth 200 *tankes* at 60 grains each.

If the relative values of silver and copper were the same in Akbar's time as now, then taking our coins the *tánke* and *dám* at 60 and 80 grains we have 106 and 80 to the rupee respectively. Taking these values, which are probably the correct ones, the revenues of Akbar according to Nizám-uddín and Abúl Fazl are £6,000,000 and £7,095,00 respectively.

INDEX

TO

JOURNAL, ASIATIC SOCIETY OF BENGAL, Vol. XLIX,

Part I, for 1880.

APPENDIX

TO "A COLLECTION OF HINDÍ ROOTS."

INDEX OF SANSKRIT ROOTS AND WORDS OCCURRING IN PAGES 33—80.

ERRATA.

Page 83,	line 22,	read	*budhya*	for	*budhga*.
„ 35,	„ 38,	„	Skr. *ṣak*	„	Skr. *sak*.
„ 44,	„ 1,	„	खिद्	„	खिद्.
„ 44,	„ 6,	„	चोट्	„	चोट.
„ 47,	„ 30,	„	झट्	„	झट.
„ 55,	„ 17,	„	सृ	„	स.
„ 57,	„ 19,	„	ऋर्ड्	„	ऋर्ड्.
„ 57,	„ 41,	„	सद्म्	„	सद्.
„ 59,	„ 33,	„	लड्	„	लड.
„ 59,	„ 39,	„	लुट्, लुल्	„	लुट, लुल.
„ 66,	„ 30, 32, 34, 35,	„	Skr. N.	„	Skr.
„ 75,	„ 13,	„	Skr. N.	„	Skr.
„ 76,	„ 35,	„	Skr. N. लुप्	„	लुप्.
„ 77,	„ 28,	„	शोभ	„	सोभ.
„ 77,	„ 37,	„	Skr. N.	„	Skr.
„ 78,	„ 24,	„	Prithiráj	„	Prithiraj.

CORRIGENDA ET ADDENDA.

Page 1, *for* Trichinopoli, *read* Trichinopoly.
„ 2, *for* stubi *(passim)*, *read* stúbi.
„ 2, line 19, *for* puránа, *read* púrana.
„ 2, „ 20, (first word) for n *read* in.
„ 2, „ 5, from bot., *for* a high, *read* high.
„ 3, „ 12, from bot., add the following note :—

'The projecting beam ends are perhaps carved to represent *Yáli* (? Griffins') heads, and the spiral lumps noticed may be the Yáli's trunk coiled up above.'

Page 4, line 6, from bot., *for* Nachaiyár, *read* Náchaiyár.
„ 5, „ 14, after metal *add*, somewhat like the Sabha (halls) at Chidambaram.
„ 5, „ 8, from bot., insert an asterisk (*) with foot note :—

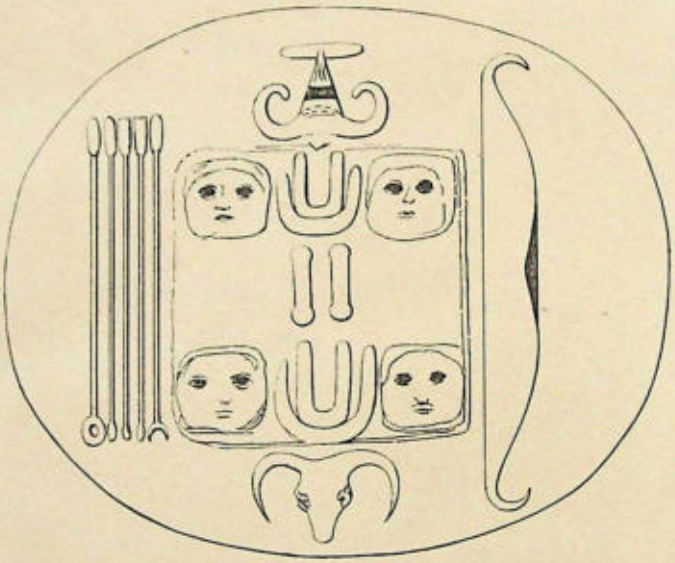
On a 2nd visit the former (upper) head appeared to be that of a ram with very curved horns, and its leg and foot cut off and put in its mouth as they still often do at village sacrificial feasts. The buffalo's head below has its tongue hanging out of its mouth.

Page 6, line 1, *after* Grám-munsif, *insert* or village officer.
„ 6, „ 17, *after* new, *insert* Jaina.
„ 7, „ 12, *for* Kasi *read* Kási.
„ 7, „ 10, from bot., *after* or, *insert* Coleroon.

2nd paper p. 8.

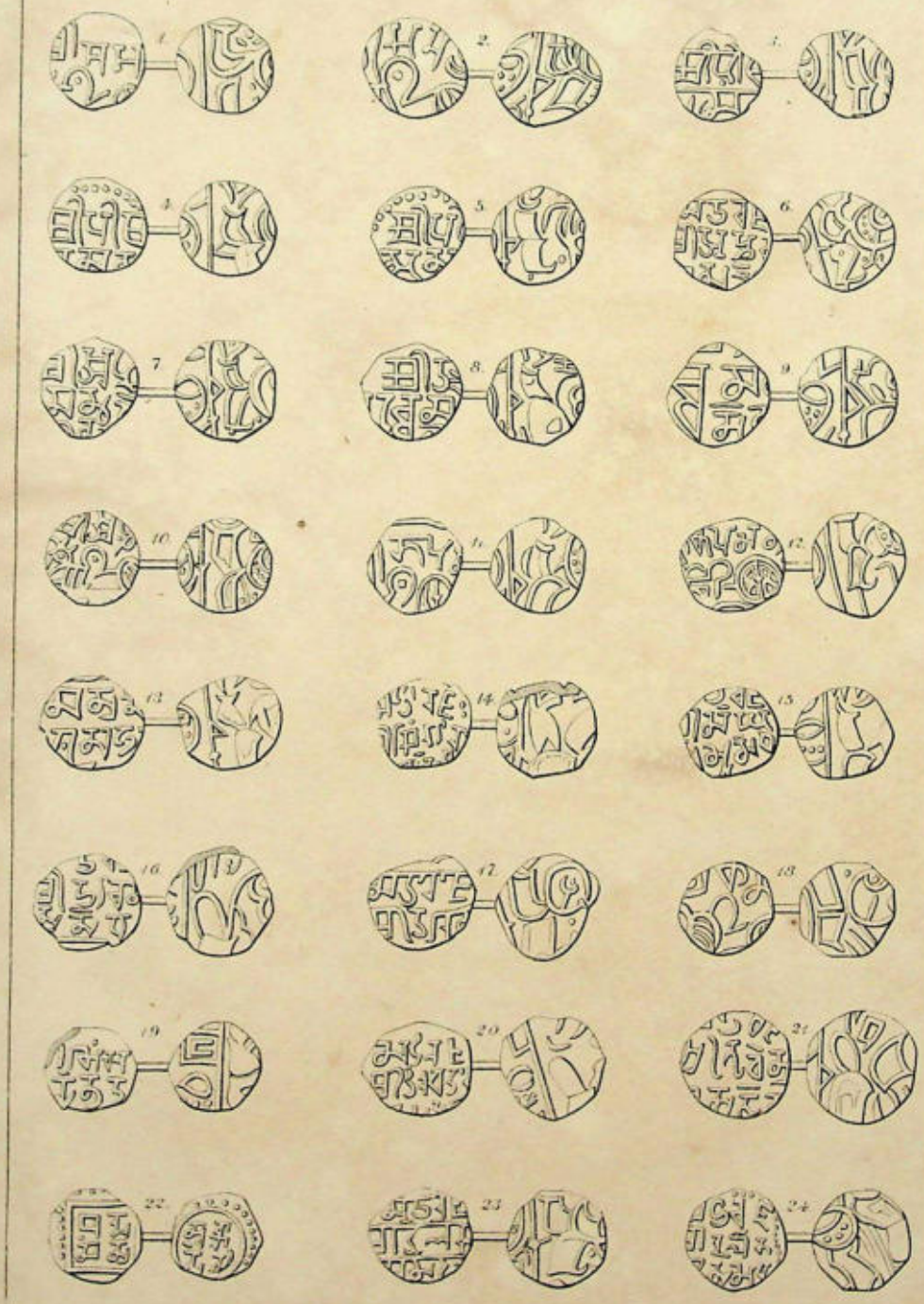
Page 8, line 12, *for* flat silled *read* flat-silled.
„ 8, „ 5, from bot., *for* shutter stone *read* shutter-stone.
„ 9, „ 13, *for* nchropolis *read* necropolis.
„ 9, „ 19, *for* similar *read kistvaen*.
„ 9, „ 13, from bot., *for chadud read chathut*.
„ 9, last line, *for* Neilipatla *read* Nellipatla.
„ 10, line 7, *for* three or four *read* six or seven.

B. R. BRANFILL.

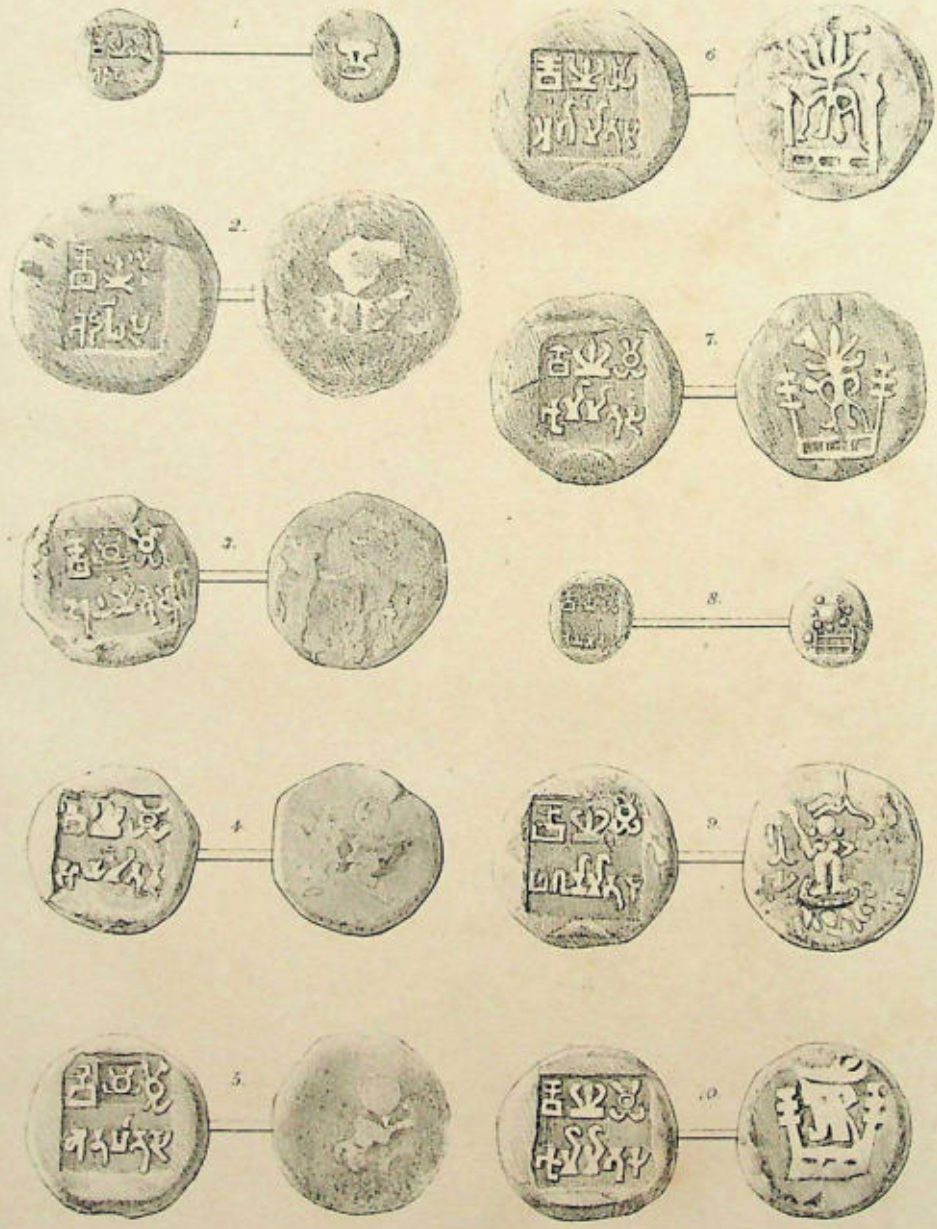


Rudely sculptured (sacrificial) stone, lying before Temple of Kamala-kanni-y-amman at Cheroj or Sanji-kóttai ("Gingee") S. Arcot.

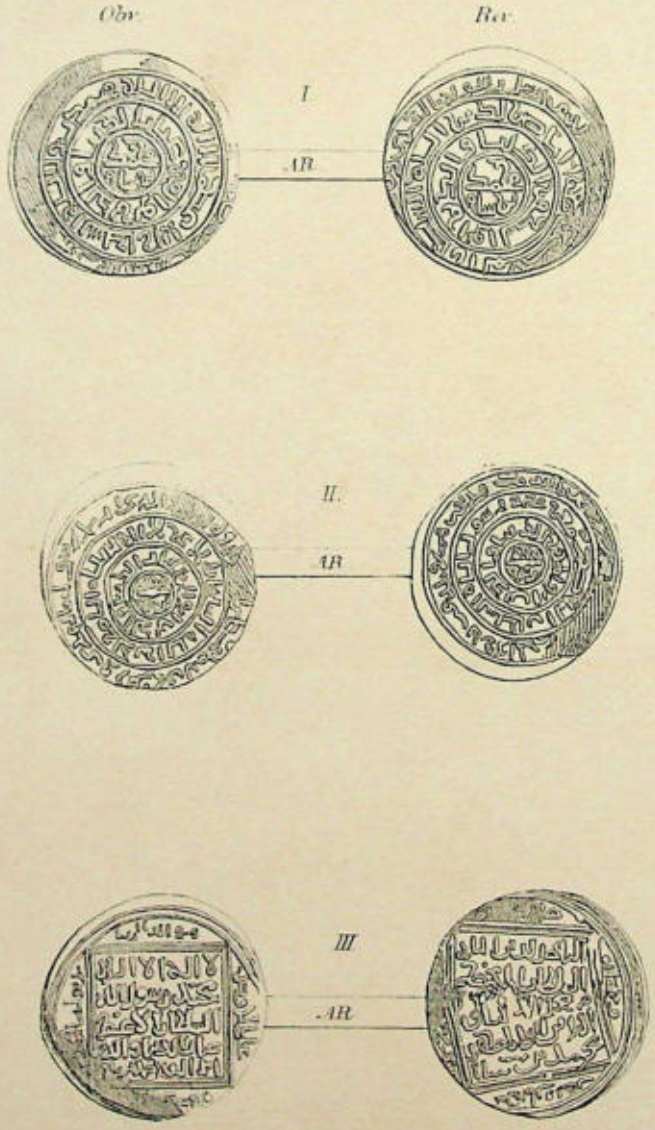
Rude sepulchral monument of stone slabs at Iralabanda—Bápanattam, in North Arcot District of Madras. Restored slightly.



COINS OF THE MAHARAJAHS OF KÁNGRA.



COINS OF THE MITRA OR SUNGA DYNASTY.



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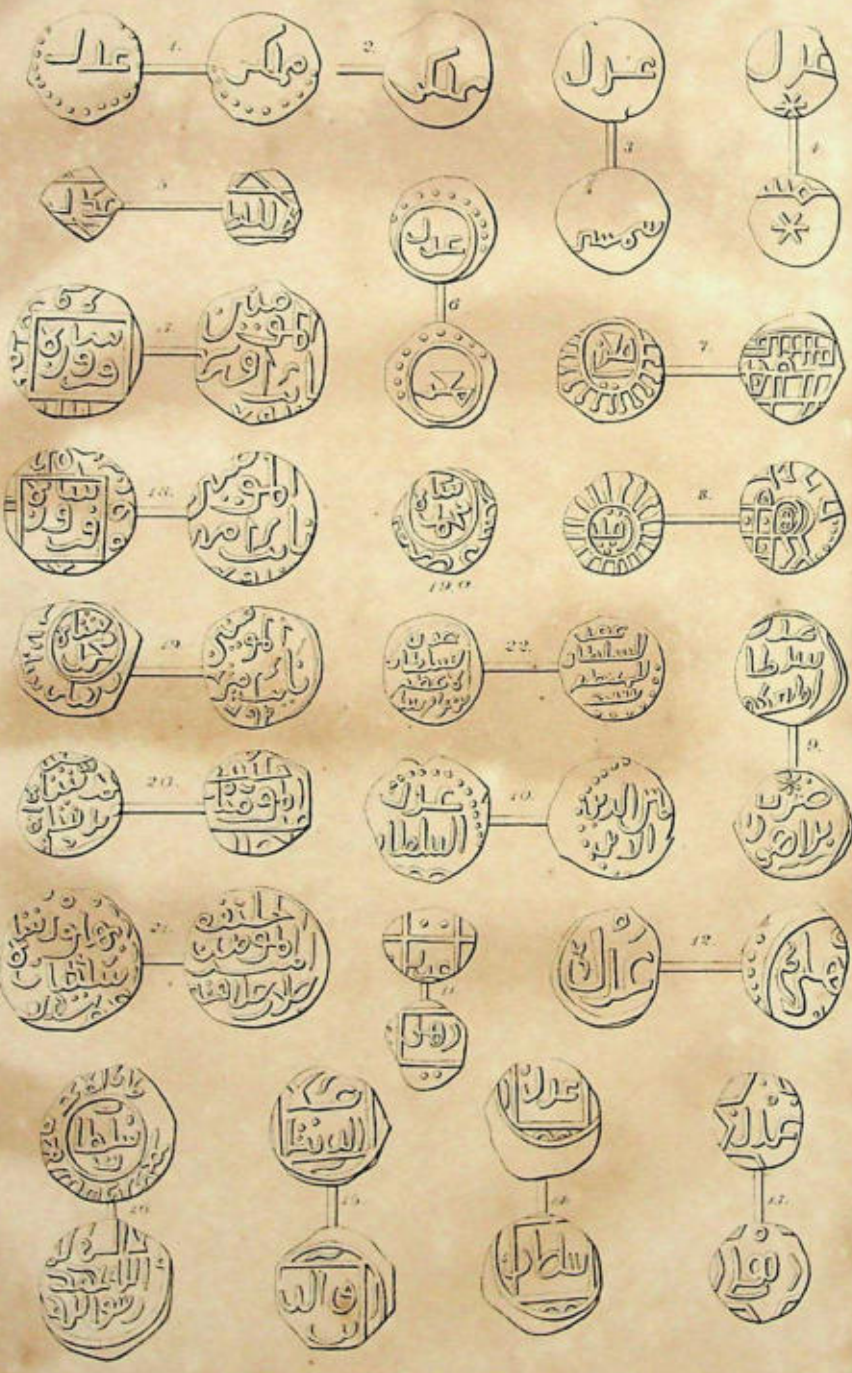
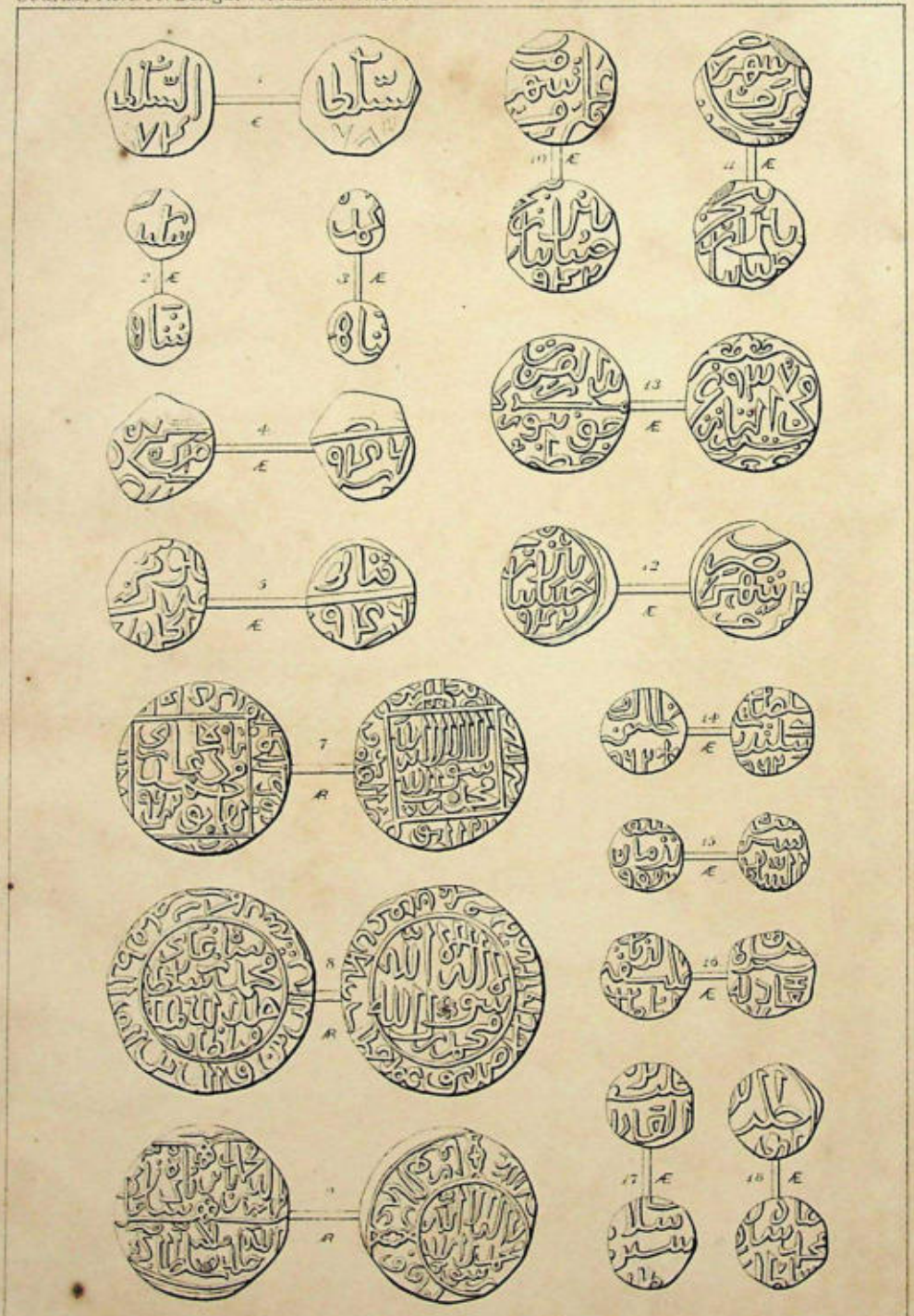


Calcutta

COINS SUPPLEMENTARY TO THOMAS' CHRONICLES OF PATHAN KINGS



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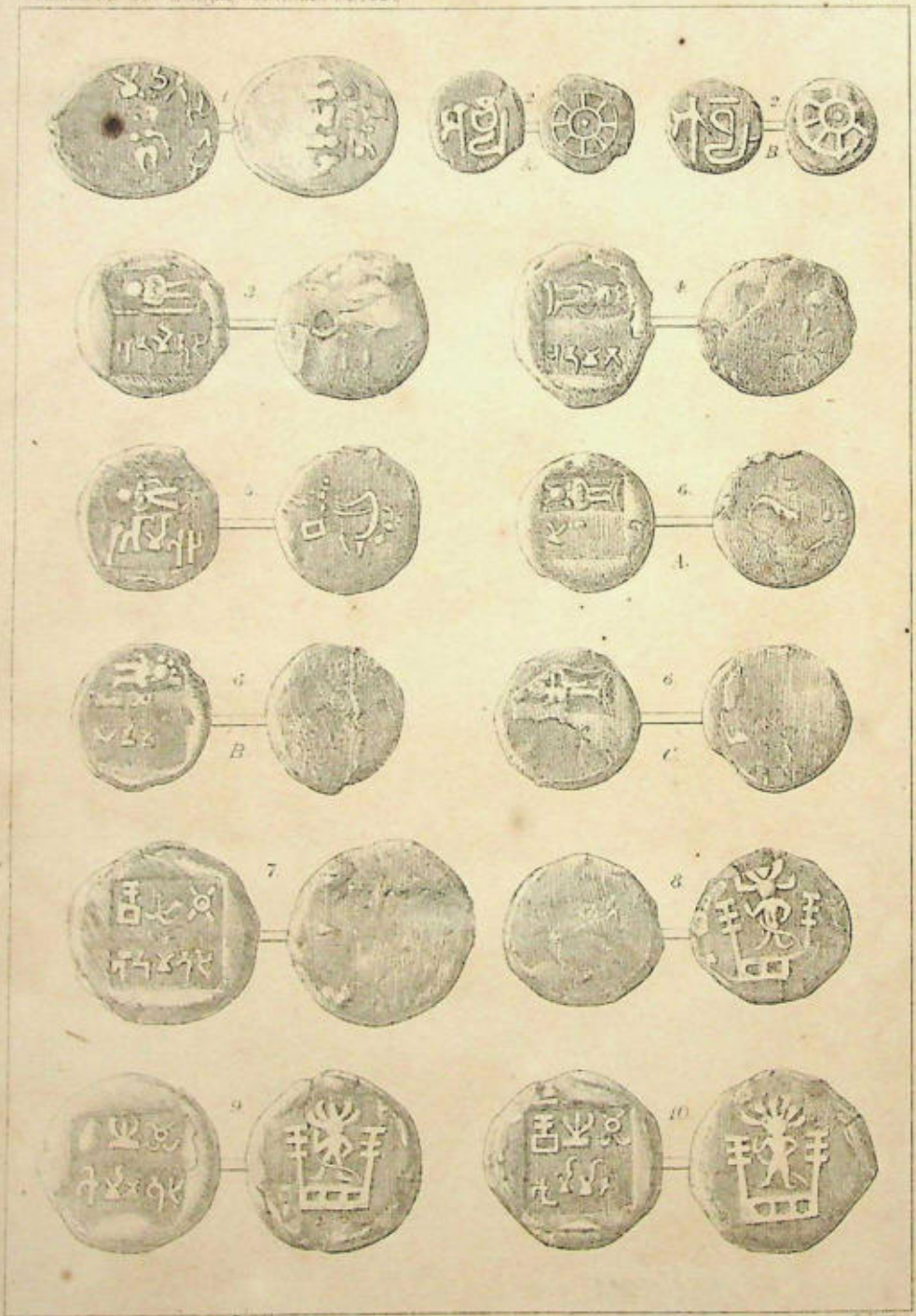
COINS SUPPLEMENTARY TO THOMAS' CHRONICLES OF PATHAN KINGS.



COINS OF THE MITRA OR SUNGA DYNASTY.

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COINS OF THE MITRA OR SUNGA DYNASTY.

COINS OF THE MITRA OR SUNGA DYNASTY.

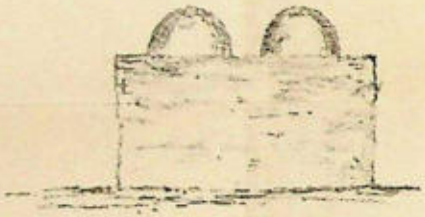

Fig. 1. Pathán Hut. Kandahar District.

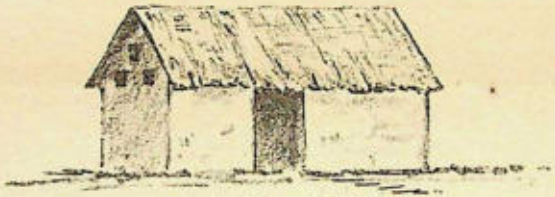

Fig. 2. Pathán Hut. Pishin Valley.

Fig. 3. An Achakzai Kizhdai or semi-permanent tent. Pishin and Kadanei Valleys.

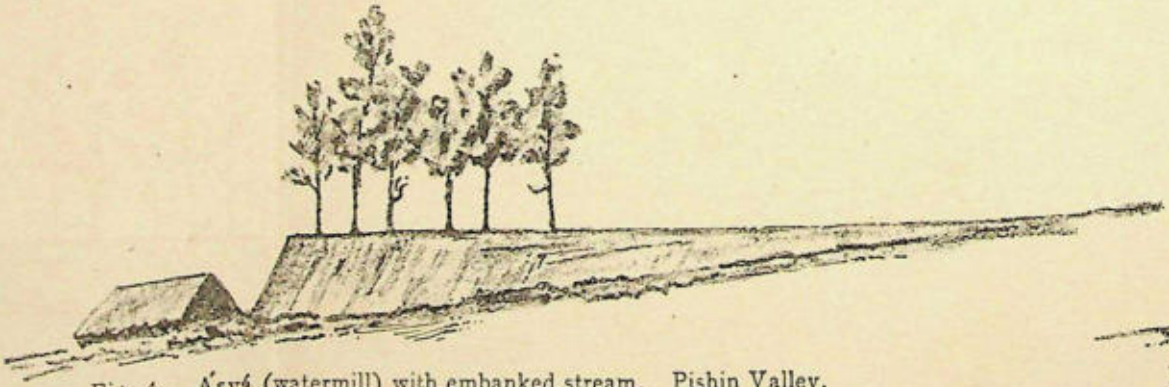

Fig. 4. Ásyá (watermill) with embanked stream. Pishin Valley.

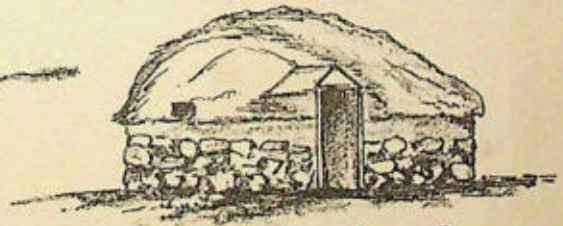

Fig. 5. Kákar Hut. Lower Gorge of the R. Ród (Ísaf Kach.)

Fig. 6. Kákar Hut. Upper Gorge of the R. Ród (Zagan Kach.)

R. C. Temple, del.

Fig. 7. Mt. Syájgai, 9,000 feet (a landmark in the Shór Valley, near Chimján) from Khwája looking East. (No Scale.)

Fig. 8. Zakhpél (Kákar) Hut. Shór Valley. Chimján.

Zincographed at the Surveyor General's Office, Calcutta

SKETCHES FROM AFGHANISTAN.

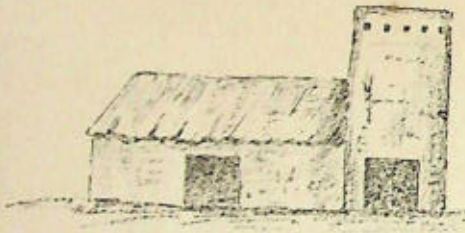

Fig. 9. Utmán Khél (Kákar) Hut.
Ghazgai Valley. Ningánd.

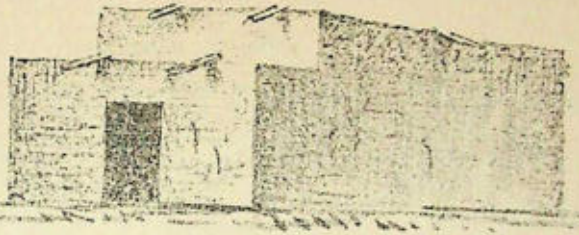

Fig. 10. Sandar Khél (Kákar) House.
Bórai Valley. Waṛiágai.

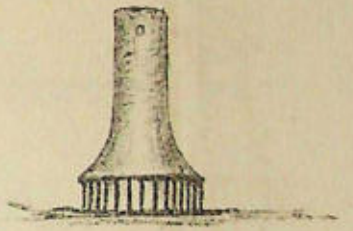

Fig. 12. Sandar Khél (Kákar) Granary
Bórai Valley. Waṛiágai.

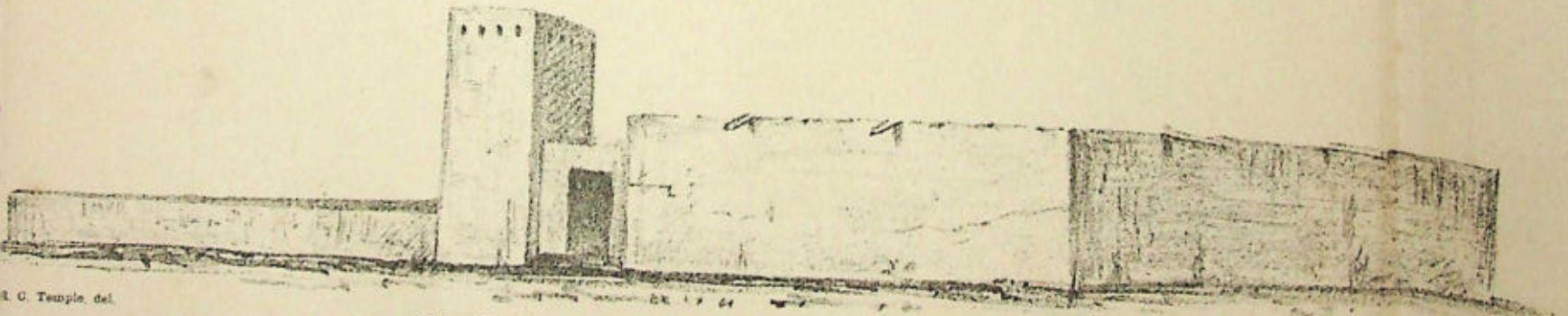

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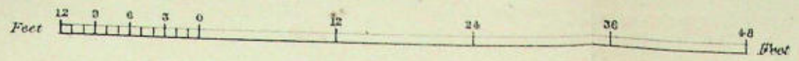
Fig. 11. Sandar Khél (Kákar) House. Bórai Valley. Waṛiágai.

Lithographed at the Surveyor General's Office, Calcutta.

SKETCHES FROM AFGHANISTAN.

Scale 12 Feet = 1 Inch.



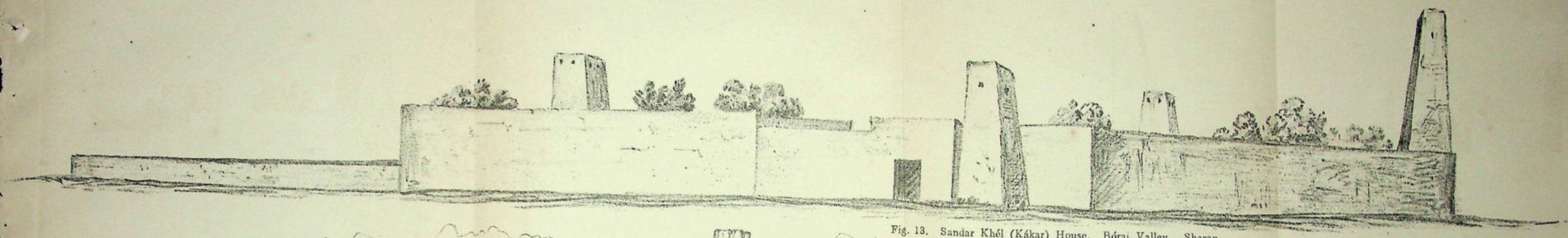


Fig. 13. Sandar Khél (Kákar) House. Bórai Valley. Sharan.

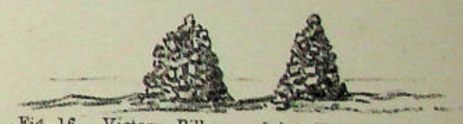


Fig. 16. Victory Pillars. Lúni Khél. Han Pas

Fig. 14. Borai Valley House. Chíná Kót, Bórai Valley. Sandar Khél Kákar Fort.

No Scale. Hillock about 50 Feet high.
Gadiwár Hills in the distance.

Fig. 15. Showing construction of a Kizhdai.

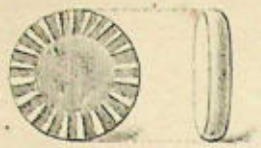
I Showing method of placing the bent withies or main props.
II Showing method of supporting withies.
III Showing method of joining withies. Side view.

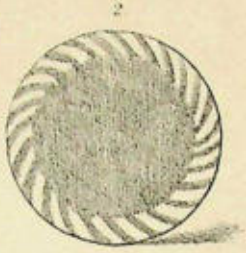
Fig. 17. A line of Ásyás (watermills) along a Kúl near Alízai, Pishín Valley.

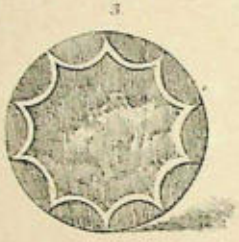
R. C. Temple, del.

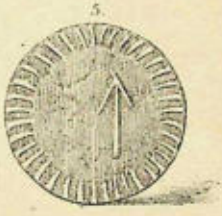
Photographed at the Surveyor General's Office, Calcutta

SKETCHES FROM AFGHANISTAN.

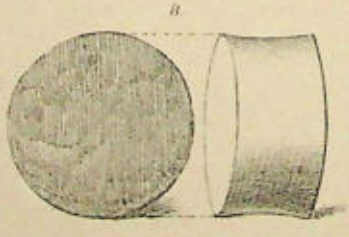


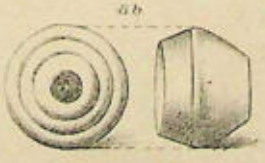






From Alabaster's
The wheel of the Law.





From Gastaldi's
Italian Antiquities.
(See N° 42.)

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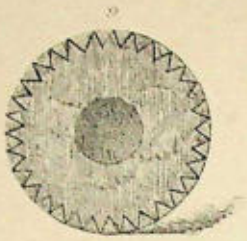
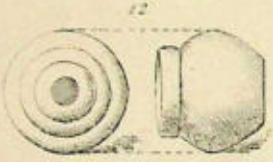
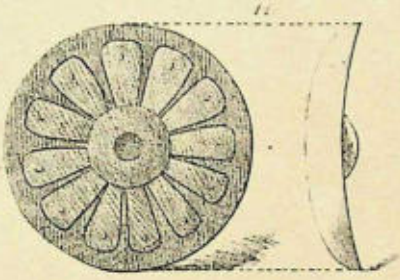
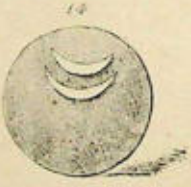
SPINDLE WHORLS ETC. FOUND AT SANKISA BEHAR
AND OTHER BUDDHIST RUINS.

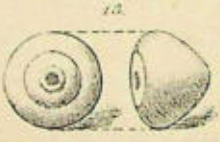


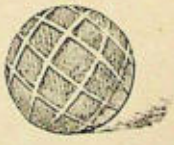
10. From Schlagintweit P. 537.

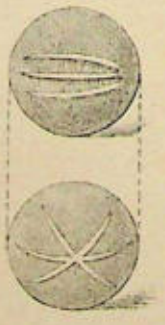












19. Glass Enamelled bead.

Length 5 inches

All full size except No 7

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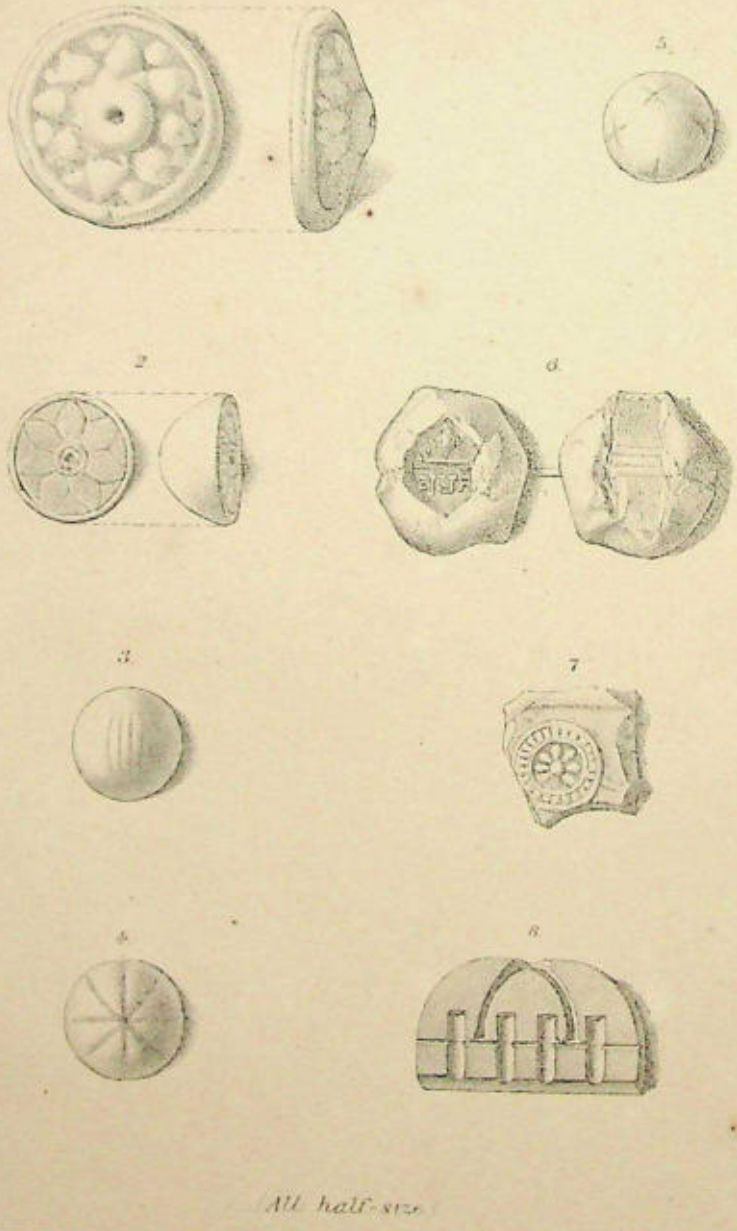
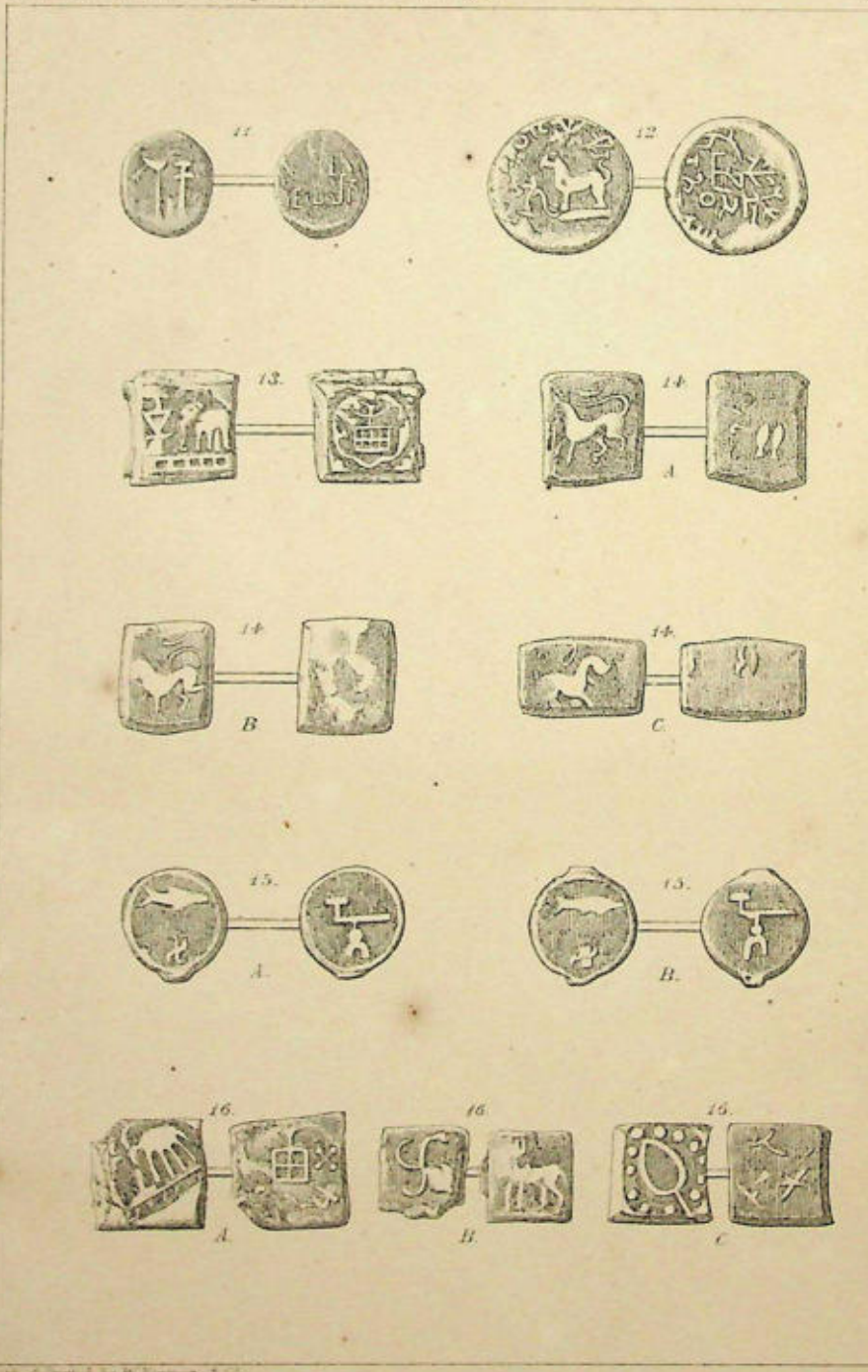
CLAY SEALS ETC FOUND AT SANKISA AND OTHER BUDDHIST RUINS IN N W PROVINCES OF INDIA

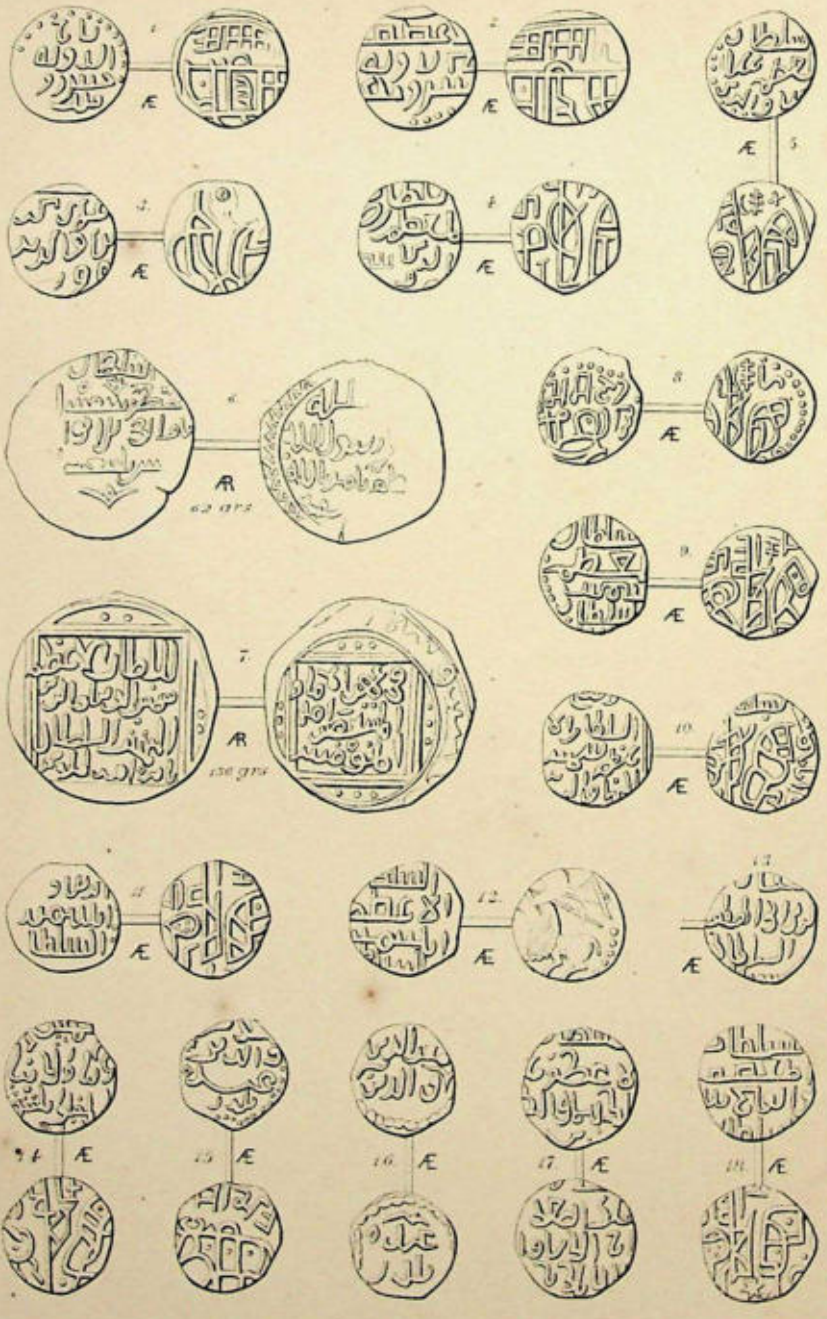


SPINDLE WHORLS ETC. FOUND AT SÁNKISA BEHAR AND OTHER BUDDHIST RUINS

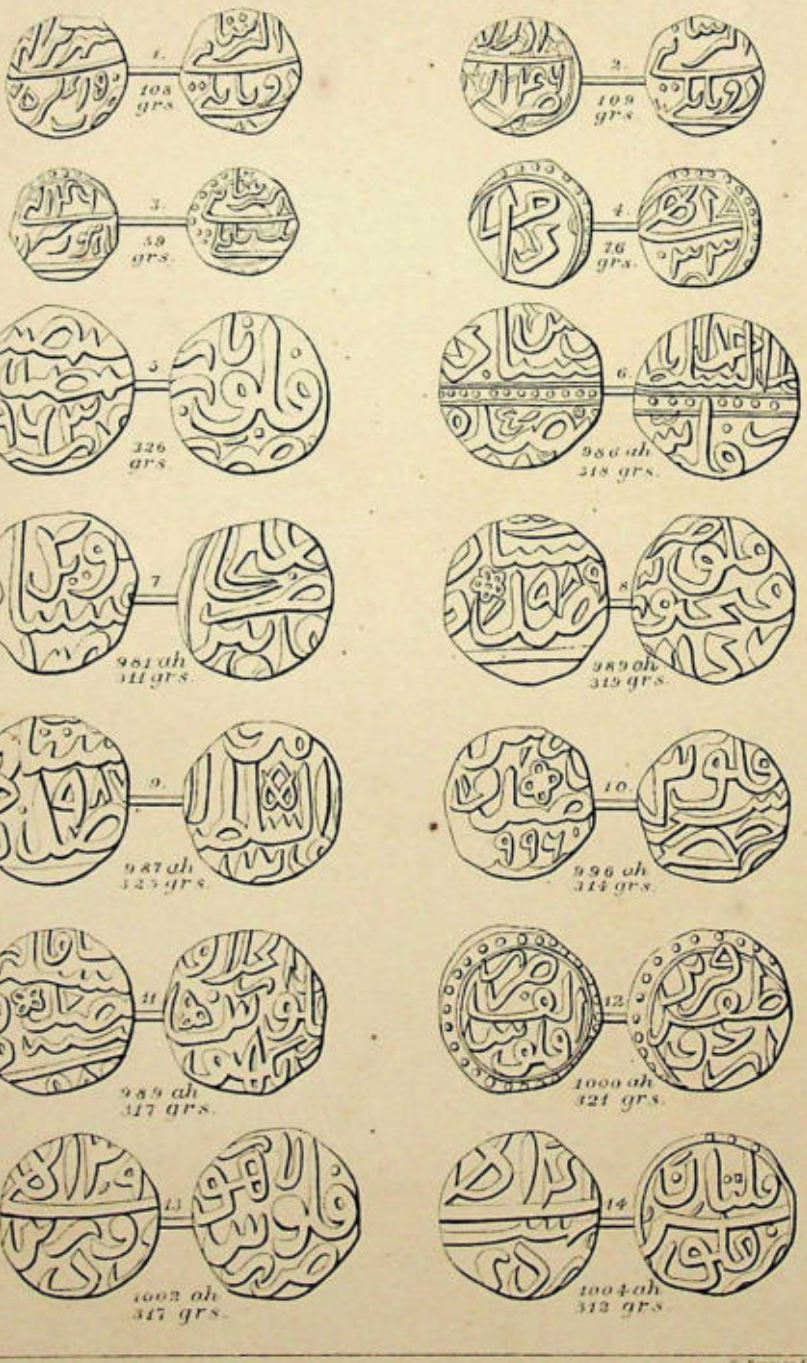
COPPER BUDDHIST COINS.



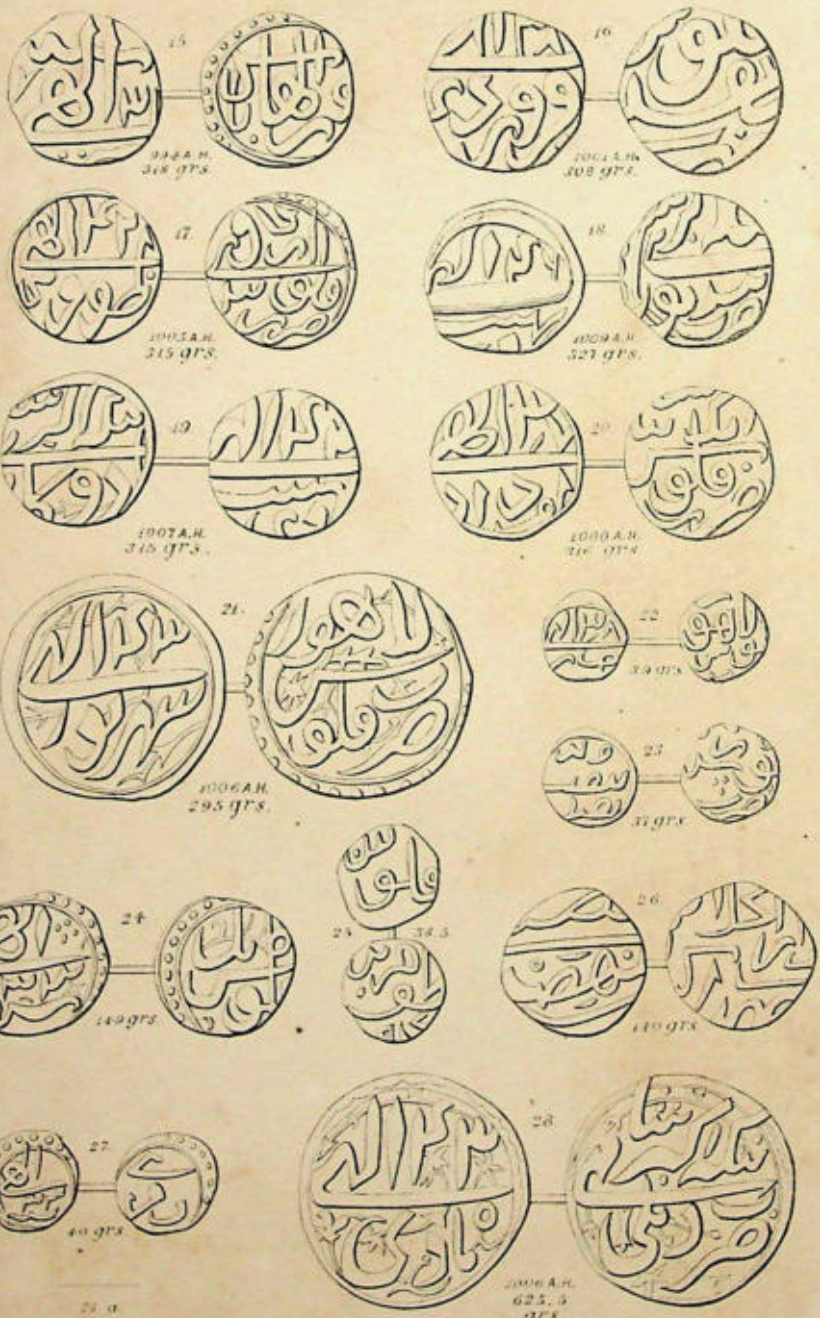
COPPER BUDDHIST COINS.



COINS SUPPLEMENTARY TO THOMAS CHRONICLES OF PATHAN KINGS.



COPPER COINS OF AKBAR.



COPPER COINS OF AKBAR.