since they are free from all exertion, and are able to do things which are impossible to man. They serve man
Page 45. in whatever he desires, and are near him in cases of need.

However, we can learn from the extract from *Sâṅkhya* that this view is not correct. For Brahman, Indra, and Prajâpati are not names of species, but of individuals. Brahman and Prajâpati very nearly mean the same, but they bear different names on account of some quality or other. Indra is the ruler of the worlds. Besides, Vâsudeva enumerates the Yaksha and Râkshasa together in one and the same class of demons, whilst the Purâṇas represent the Yaksha as guardian-angels and the servants of guardian-angels.

On the Devas. After all this, we declare that the spiritual beings which we have mentioned are one category, who have attained their present stage of existence by action during the time when they were human beings. They have left their bodies behind them, for bodies are weights which impair the power and shorten the duration of life. Their qualities and conditions are different, in the same measure as one or other of the *three primary forces* prevails over them. The first force is peculiar to the Deva, or angels who live in quietness and bliss. The predominant faculty of their mind is the comprehending of an idea *without matter*, as it is the predominant faculty of the mind of man to comprehend the idea *in matter*.

The *third force* is peculiar to the Piśâca and Bhûta, whilst the second is peculiar to the classes between them.

The Hindus say that the number of Deva is thirty-three *koṭi* or *crore*, of which eleven belong to Mahâdeva. Therefore this number is one of his surnames, and his name itself (Mahâdeva) points in this direction. The sum of the number of angels just mentioned would be 330,000,000.

Further, they represent the Deva as eating and drinking, cohabiting, living and dying, since they exist

within matter, though in the most subtle and most simple kind of it, and since they have attained this by action, not by knowledge. The book *Patañjali* relates that Nandikeśvara offered many sacrifices to Mahâdeva, and was in consequence transferred into paradise in his human shape; that Indra, the ruler, had intercourse with the wife of Nahusha the Brahmin, and therefore was changed into a serpent by way of punishment.

On the Pitaras and Rishis.

After the Deva comes the class of the *Pitaras*, the deceased ancestors, and after them the *Bhâta*, human beings who have attached themselves to the *spiritual beings* (Deva), and stand in the middle between them and mankind. He who holds this degree, but without being free from the body, is called either *Rishi* or *Siddha* or *Muni*, and these differ among themselves according to their qualities. *Siddha* is he who has attained by his action the faculty to do in the world whatever he likes, but who does not aspire further, and does not exert himself on the path leading to liberation. He may ascend to the degree of a Rishi. If a Brahmin attains this degree, he is called *Brahmarshi;* if the Kshatriya attains it, he is called *Râjarshi*. It is not possible for the lower classes to attain this degree. Rishis are the sages who, though they are only human beings, excel the angels on account of their knowledge. Therefore the angels learn from them, and above them there is none but Brahman.

After the Brahmarshi and Râjarshi come those classes of the populace which exist also among us, the castes, to whom we shall devote a separate chapter.

Vishnu the unity of Brahman, Nârâyana, and Rudra.

All these latter beings are ranged under matter. Now, as regards the notion of that which is above matter, we say that the ὕλη is the middle between matter and the spiritual divine ideas that are above matter, and that the *three primary forces* exist in the ὕλη dynamically (ἐν δυνάμει). So the ὕλη, with all that is comprehended in it, is a bridge from above to below.

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Any life which circulates in the ὕλη under the exclusive influence of the *First Cause* is called *Brahman, Prajâpati*, and by many other names which occur in their religious law and tradition. It is identical with nature in so far as it is active, for all bringing into existence, the creation of the world also, is attributed by them to Brahman.

Any life which circulates in the ὕλη under the influence of the *second force* is called *Nârâyaṇa* in the tradition of the Hindus, which means nature in so far as it has reached the end of its action, and is now striving to preserve that which has been produced. Thus Nârâyaṇa strives so to arrange the world that it should endure.

Any life which circulates in the ὕλη under the influence of the *third force* is called *Mahâdeva* and *Śaṅkara*, but his best-known name is *Rudra*. His work is destruction and annihilation, like nature in the last stages of its activity, when its power slackens.

These three beings bear different names, as they circulate through the various degrees to above and below, and accordingly their actions are different.

But prior to all these beings there is one source whence everything is derived, and in this unity they comprehend all three things, no more separating one from the other. This unity they call *Vishṇu*, a name which more properly designates the *middle force;* but sometimes they do not even make a distinction between this *middle force* and *the first cause* (*i.e.* they make Nârâyaṇa the *causa causarum*).

Here there is an analogy between Hindus and Christians, as the latter distinguish between the Three *Persons* and give them separate names, Father, Son, and Holy Ghost, but unite them into one substance.

This is what clearly results from a careful examination of the Hindu doctrines. Of their traditional accounts, which are full of silly notions, we shall speak

hereafter in the course of our explanation. You must not wonder if the Hindus, in their stories about the class of the Deva, whom we have explained as *angels*, allow them all sorts of things, unreasonable in themselves, some perhaps not objectionable, others decidedly objectionable, both of which the theologians of Islam would declare to be incompatible with the dignity and nature of angels.

Greek parallels. Stories about Zeus.

If you compare these traditions with those of the Greeks regarding their own religion, you will cease to find the Hindu system strange. We have already mentioned that they called the angels gods (p. 36). Now consider their stories about Zeus, and you will understand the truth of our remark. As for anthropomorphisms and traits of animal life which they attribute to him, we give the following tradition: "When he was born, his father wanted to devour him; but his mother took a stone, wrapped rags round it, and gave him the stone to swallow, whereupon he went away." This is also mentioned by Galenus in his *Book of Speeches*, where he relates that Philo had in an enigmatical way described the preparation of the φιλώνειον φάρμακον in a poem of his by the following words:—

> "*Take red hair, diffusing sweet odour, the offering to the gods,*
> *And of man's blood weigh weights of the number of the mental faculties.*"

The poet means *five* pounds of saffron, because the senses are *five*. The weights of the other ingredients of the mixture he describes in similar enigmatic terms, of which Galenus gives a commentary. In the same poem occurs the following verse:—

> "*And of the pseudonymous root which has grown in the district in which Zeus was born.*"

To which Galenus adds: "This is *Andropogon Nardus*, which *bears a false name*, because it is called *an ear* of corn, although it is not an ear, but a root. The poet

prescribes that it should be Cretan, because the mythologists relate that Zeus was born on the mountain
Page 47. *Δικταῖον* in Creta, where his mother concealed him from his father Kronos, that he should not devour him as he had devoured others."

Besides, well-known story-books tell that he married certain women one after the other, cohabited with others, doing violence to them and not marrying them; among them Europa, the daughter of Phœnix, who was taken from him by Asterios, king of Crete. Afterwards she gave birth to two children from him, Minos and Rhadamanthus. This happened long before the Israelites left the desert and entered Palestine.

Another tradition is that he died in Crete, and was buried there at the time of Samson the Israelite, being 780 years of age; that he was called *Zeus* when he had become old, after he had formerly been called *Dios;* and that the first who gave him this name was Cecrops, the first king of Athens. It was common to all of them to indulge in their lusts without any restraint, and to favour the business of the pander; and so far they were not unlike Zoroaster and King Gushtâsp when they desired to consolidate the realm and the rule (*sic*).

Chroniclers maintain that Cecrops and his successors are the source of all the vices among the Athenians, meaning thereby such things as occur in the story of Alexander, viz. that Nectanebus, king of Egypt, after having fled before Artaxerxes the Black and hiding in the capital of Macedonia, occupied himself with astrology and soothsaying; that he beguiled Olympias, the wife of King Philip, who was absent. He cunningly contrived to cohabit with her, showing himself to her in the figure of the god Ammon, as a serpent with two heads like rams' heads. So she became pregnant with Alexander. Philip, on returning, was about to disclaim the paternity, but then he dreamt that it was the child of the god Ammon. Thereupon he recognised the child

as his, and spoke, "Man cannot oppose the gods." The combination of the stars had shown to Nectanebus that he would die at the hands of his *son*. When then he died at the hands of Alexander from a wound in the neck, he recognised that he was his (Alexander's) father.

The tradition of the Greeks is full of similar things. We shall relate similar subjects when speaking of the marriages of the Hindus.

Now we return to our subject. Regarding that part of the nature of Zeus which has no connection with humanity, the Greeks say that he is Jupiter, the son of Saturn; for Saturn alone is eternal, not having been born, according to the philosophers of the Academy, as Galenus says in the *Book of Deduction*. This is sufficiently proved by the book of Aratos on the *Φαινόμενα*, for he begins with the praise of Zeus: Quotations from Aratos.

"We, mankind, do not leave him, nor can we do without him;
Of him the roads are full,
And the meeting-places of men.
He is mild towards them;
He produces for them what they wish, and incites them to work.
Reminding them of the necessities of life,
He indicates to them the times favourable
For digging and ploughing for a good growth,
Who has raised the signs and stars in heaven.
Therefore we humiliate ourselves before him first and last."

And then he praises the spiritual beings (the Muses). If you compare Greek theology with that of the Hindus, you will find that Brahman is described in the same way as Zeus by Aratos.

The author of the commentary on the *Φαινόμενα* of Aratos maintains that he deviated from the custom of the poets of his time in beginning with the gods; that it was his intention to speak of the celestial sphere. Further, he makes reflections on the origin of Asclepius, like Galenus, and says: "We should like to know Page 48.

which Zeus Aratos meant, the mystical or the physical one. For the poet Krates called the celestial sphere *Zeus*, and likewise Homer says:

'As pieces of snow are cut off from *Zeus*.'"

Aratos calls the ether and the air *Zeus* in the passage: "The roads and the meeting-places are full of him, and we all must inhale him."

Therefore the philosophers of the Stoa maintain that Zeus is the spirit which is dispersed in the ὕλη, and similar to our souls, *i.e.* the nature which rules every natural body. The author supposes that he is mild, since he is the cause of the good; therefore he is right in maintaining that he has not only created men, but also the gods.

CHAPTER IX.

ON THE CASTES, CALLED "COLOURS" (VARṆA), AND ON THE CLASSES BELOW THEM.

Throne and altar.

If a new order of things in political or social life is created by a man naturally ambitious of ruling, who by his character and capacity really deserves to be a ruler, a man of firm convictions and unshaken determination, who even in times of reverses is supported by good luck, in so far as people then side with him in recognition of former merits of his, such an order is likely to become consolidated among those for whom it was created, and to continue as firm as the deeply rooted mountains. It will remain among them as a generally recognised rule in all generations through the course of time and the flight of ages. If, then, this new form of state or society rests in some degree on religion, these twins, state and religion, are in perfect harmony, and their union represents the highest development of human society, all that men can possibly desire.

The kings of antiquity, who were industriously devoted to the duties of their office, spent most of their care on the division of their subjects into different classes and orders, which they tried to preserve from intermixture and disorder. Therefore they forbade people of different classes to have intercourse with each other, and laid upon each class a particular kind of work or art and handicraft. They did not allow anybody to transgress the limits of his class, and even

punished those who would not be content with their class.

Castes of the ancient Persians.

All this is well illustrated by the history of the ancient Chosroes (Khusrau), for they had created great institutions of this kind, which could not be broken through by the special merits of any individual nor by bribery. When Ardashîr ben Bâbak restored the Persian empire, he also restored the classes or castes of the population in the following way:—

The first class were the knights and princes.

The second class the monks, the fire-priests, and the lawyers.

The third class the physicians, astronomers, and other men of science.

The fourth class the husbandmen and artisans.

And within these classes there were subdivisions, distinct from each other, like the species within a genus. All institutions of this kind are like a pedigree, as long as their origin is remembered; but when once their origin has been forgotten, they become, as it were, the stable property of the whole nation, nobody any more questioning its origin. And forgetting is the necessary result of any long period of time, of a long succession of centuries and generations.

Among the Hindus institutions of this kind abound. We Muslims, of course, stand entirely on the other side of the question, considering all men as equal, except in piety; and this is the greatest obstacle which prevents any approach or understanding between Hindus and Muslims.

The four castes.

The Hindus call their castes *varṇa*, i.e. *colours*, and from a genealogical point of view they call them *jâtaka*, i.e. *births*. These castes are from the very beginning only four.

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I. The highest caste are the Brâhmaṇa, of whom the books of the Hindus tell that they were created from the head of Brahman. And as Brahman is only another

name for the force called *nature*, and the head is the highest part of the animal body, the Brâhmaṇa are the choice part of the whole genus. Therefore the Hindus consider them as the very best of mankind.

II. The next caste are the Kshatriya, who were created, as they say, from the shoulders and hands of Brahman. Their degree is not much below that of the Brâhmaṇa.

III. After them follow the Vaiśya, who were created from the thigh of Brahman.

IV. The Śûdra, who were created from his feet.

Between the latter two classes there is no very great distance. Much, however, as these classes differ from each other, they live together in the same towns and villages, mixed together in the same houses and lodgings.

Low-caste people.

After the Śûdra follow the people called *Antyaja*, who render various kinds of services, who are not reckoned amongst any caste, but only as members of a certain craft or profession. There are eight classes of them, who freely intermarry with each other, except the fuller, shoemaker, and weaver, for no others would condescend to have anything to do with them. These eight guilds are the fuller, shoemaker, juggler, the basket and shield maker, the sailor, fisherman, the hunter of wild animals and of birds, and the weaver. The four castes do not live together with them in one and the same place. These guilds live near the villages and towns of the four castes, but outside them.

The people called Hâḍî, Ḍoma (Ḍomba), Caṇḍâla, and Badhatau (*sic*) are not reckoned amongst any caste or guild. They are occupied with dirty work, like the cleansing of the villages and other services. They are considered as one sole class, and distinguished only by their occupations. In fact, they are considered like illegitimate children; for according to general opinion they descend from a Śûdra father and a Brâhmaṇî

mother as the children of fornication; therefore they are degraded outcasts.

Different occupations of the castes and guilds.

The Hindus give to every single man of the four castes characteristic names, according to their occupations and modes of life. *E.g.* the Brâhmaṇa is in general called by this name as long as he does his work staying at home. When he is busy with the service of one fire, he is called *ishṭin;* if he serves three fires, he is called *agnihôtrin;* if he besides offers an offering to the fire, he is called *dîkshita.* And as it is with the Brâhmaṇa, so is it also with the other castes. Of the classes *beneath* the castes, the Hâḍî are the best spoken of, because they keep themselves free from everything unclean. Next follow the Ḍôma, who play on the lute and sing. The still lower classes practise as a trade killing and the inflicting of judicial punishments. The worst of all are the Badhatau, who not only devour the flesh of dead animals, but even of dogs and other beasts.

Customs of the Brahmins.

Each of the four castes, when eating together, must form a group for themselves, one group not being allowed to comprise two men of different castes. If, further, in the group of the Brâhmaṇa there are two men who live at enmity with each other, and the seat of the one is by the side of the other, they make a barrier between the two seats by placing a board between them, or by spreading a piece of dress, or in some other way; and if there is only a line drawn between them, they are considered as separated. Since it is forbidden to eat the remains of a meal, every single man must have his own food for himself; for if any one of the party who are eating should take of the food from one and the same plate, that which remains in the plate becomes, after the first eater has taken part, to him who wants to take as the second, *the remains of the meal,* and such is forbidden.

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Such is the condition of the four castes. Arjuna

asked about the nature of the four castes and what must be their moral qualities, whereupon Vâsudeva answered:

"The Brâhmaṇa must have an ample intellect, a quiet heart, truthful speech, much patience; he must be master of his senses, a lover of justice, of evident purity, always directed upon worship, entirely bent upon religion.

"The Kshatriya must fill the hearts with terror, must be brave and high-minded, must have ready speech and a liberal hand, not minding dangers, only intent upon carrying the great tasks of his calling to a happy end.

"The Vaiśya is to occupy himself with agriculture, with the acquisition of cattle, and with trade.

"The Śûdra is to endeavour to render services and attention to each of the preceding classes, in order to make himself liked by them.

"If each member of these castes adheres to his customs and usages, he will obtain the happiness he wishes for, supposing that he is not negligent in the worship of God, not forgetting to remember him in his most important avocations. But if anybody wants to quit the works and duties of his caste and adopt those of another caste, even if it would bring a certain honour to the latter, it is a sin, because it is a transgression of the rule."

Further, Vâsudeva speaks, inspiring him with courage to fight the enemy: "Dost thou not know, O man with the long arm, that thou art a Kshatriya; that thy race has been created brave, to rush boldly to the charge, to care little for the vicissitudes of time, never to give way whenever their soul has a foreboding of coming misfortune? for only thereby is the reward to be obtained. If he conquers, he obtains power and good fortune. If he perishes, he obtains paradise and bliss. Besides, thou showest weakness in the presence of the enemy, and seemest melancholy at the prospect of

killing this host; but it will be infinitely worse if thy name will spread as that of a timid, cowardly man, that thy reputation among the heroes and the experienced warriors will be gone, that thou wilt be out of their sight, and thy name no longer be remembered among them. I do not know a worse punishment than such a state. Death is better than to expose thyself to the consequences of ignominy. If, therefore, God has ordered thee to fight, if he has deigned to confer upon thy caste the task of fighting and has created thee for it, carry out his order and perform his will with a determination which is free from any desire, so that thy action be exclusively devoted to him."

Moksha and the various castes.

Hindus differ among themselves as to which of these castes is capable of attaining to liberation; for, according to some, only the Brâhmaṇa and Kshatriya are capable of it, since the others cannot learn the Veda, whilst according to the Hindu philosophers, liberation is common to all castes and to the whole human race, if their intention of obtaining it is perfect. This view is based on the saying of Vyâsa: "Learn to know the twenty-five things thoroughly. Then you may follow whatever religion you like; you will no doubt be liberated." This view is also based on the fact that Vâsudeva was a descendant of a Śûdra family, and also on the following saying of his, which he addressed to Arjuna: "God distributes recompense without injustice and without partiality. He reckons the good as bad if people in doing good forget him; he reckons the bad as good if people in doing bad remember him and do not forget him, whether those people be Vaiśya or Śûdra or women. How much more will this be the case when they are Brâhmaṇa or Kshatriya."

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CHAPTER X.

ON THE SOURCE OF THEIR RELIGIOUS AND CIVIL LAW, ON PROPHETS, AND ON THE QUESTION WHETHER SINGLE LAWS CAN BE ABROGATED OR NOT.

Law and religion among the Greeks founded by their sages.

THE ancient Greeks received their religious and civil laws from sages among them who were called to the work, and of whom their countrymen believed that they received divine help, like Solon, Draco, Pythagoras, Minos, and others. Also their kings did the same; for Mianos (*sic*), when ruling over the islands of the sea and over the Cretans about two hundred years after Moses, gave them laws, pretending to have received them from Zeus. About the same time also Minos (*sic*) gave his laws.

At the time of Darius I., the successor of Cyrus, the Romans sent messengers to the Athenians, and received from them the laws in twelve books, under which they lived till the rule of Pompilius (Numa). This king gave them new laws; he assigned to the year twelve months, whilst up to that time it had only had ten months. It appears that he introduced his innovations against the will of the Romans, for he ordered them to use as instruments of barter in commerce pieces of pottery and hides instead of silver, which seems on his part to betray a certain anger against rebellious subjects.

Quotation from Plato's *Laws*.

In the first chapter of the *Book of Laws* of Plato, the Athenian stranger says: "Who do you think was the

first who gave laws to you? Was he an angel or a man?" The man of Cnossus said: "He was an angel. In truth, with us it was Zeus, but with the Lacedæmonians, as they maintain, the legislator was Apollo."

Further, he says in the same chapter: "It is the duty of the legislator, if he comes from God, to make the acquisition of the greatest virtues and of the highest justice the object of his legislation."

He describes the laws of the Cretans as rendering perfect the happiness of those who make the proper use of them, because by them they acquire all the human good which is dependent upon the divine good.

The Athenian says in the second chapter of the same book: "The gods, pitying mankind as born for trouble, instituted for them feasts to the gods, the Muses, Apollo the ruler of the Muses, and to Dionysos, who gave men wine as a remedy against the bitterness of old age, that old men should again be young by forgetting sadness, and by bringing back the character of the soul from the state of affliction to the state of soundness."

Further he says: "They have given to men by inspiration the arrangements for dancing, and the equally weighed rhythm as a reward for fatigues, and that they may become accustomed to live together with them in feasts and joy. Therefore they call one kind of their music *praises*, with an implied allusion to the prayers to the gods."

Such was the case with the Greeks, and it is precisely the same with the Hindus. For they believe that their religious law and its single precepts derive their origin from Rishis, their sages, the pillars of their religion, and not from the prophet, *i.e.* Nârâyaṇa, who, when coming into this world, appears in some human figure. But he only comes in order to cut away some evil matter which threatens the world, or to set the world right again when anything has gone wrong. Further, no

The Rishis, the authors of Hindu law. Page 52.

law can be exchanged or replaced by another, for they use the laws simply as they find them. Therefore they can dispense with prophets, as far as law and worship are concerned, though in other affairs of the creation they sometimes want them.

Whether laws may be abrogated or not.

As for the question of the abrogation of laws, it seems that this is not impossible with the Hindus, for they say that many things which are now forbidden were allowed before the coming of Vâsudeva, *e.g.* the flesh of cows. Such changes are necessitated by the change of the nature of man, and by their being too feeble to bear the whole burden of their duties. To these changes also belong the changes of the *matrimonial system* and of *the theory of descent*. For in former times there were three modes of determining descent or relationship:

Different matrimonial systems.

1. The child born to a man by his legitimate wife is the child of the father, as is the custom with us and with the Hindus.

2. If a man marries a woman and has a child by her; if, further, the marriage-contract stipulates that the children of the woman will belong to *her* father, the child is considered as the child of its grandfather who made that stipulation, and not as the child of its father who engendered it.

3. If a stranger has a child by a married woman, the child belongs to her husband, since the wife being, as it were, the soil in which the child has grown, is the property of the husband, always presupposing that the sowing, *i.e.* the cohabitation, takes place with his consent.

The story of Pâṇḍu and Vyâsa.

According to this principle, Pâṇḍu was considered as the son of Śântanu; for this king had been cursed by an anchorite, and in consequence was unable to cohabit with his wives, which was the more provoking to him as he had not yet any children. Now he asked Vyâsa, the son of Parâśara, to procreate for him children from

his wives in his place. Pâṇḍu sent him one, but she was afraid of him when he cohabitated with her, and trembled, in consequence of which she conceived a sickly child of yellow hue. Then the king sent him a second woman; she, too, felt much reverence for him, and wrapped herself up in her veil, and in consequence she gave birth to Dhṛitarâshṭra, who was blind and unhealthy. Lastly, he sent him a third woman, whom he enjoined to put aside all fear and reverence with regard to the saint. Laughing and in high spirits, she went in to him, and conceived from him a child of moon-like beauty, who excelled all men in boldness and cunning.

Birth of Vyâsa.

The four sons of Pâṇḍu had one wife in common, who stayed one month with each of them alternately. In the books of the Hindus it is told that Parâśara, the hermit, one day travelled in a boat in which there was also a daughter of the boatman. He fell in love with her, tried to seduce her, and finally she yielded; but there was nothing on the bank of the river to hide them from the looks of the people. However, instantaneously there grew a tamarisk-tree to facilitate their purpose. Now he cohabited with her behind the tamarisk, and made her conceive, whereupon she became pregnant with this his excellent son Vyâsa.

All these customs have now been abolished and abrogated, and therefore we may infer from their tradition that in principle *the abrogation of a law is allowable.*

Various kinds of marriage with Tibetans and Arabs.

As regards unnatural kinds of marriage, we must state that such exist still in our time, as they also existed in the times of Arab heathendom; for the people inhabiting the mountains stretching from the region of Panchîr into the neighbourhood of Kashmîr live under the rule that several brothers have one wife in common. Among the heathen Arabs, too, marriage was of different kinds:—

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1. An Arab ordered his wife to be sent to a certain

man to demand sexual intercourse with him; then he abstained from her during the whole time of her pregnancy, since he wished to have from her a generous offspring. This is identical with the third kind of marriage among the Hindus.

2. A second kind was this, that the one Arab said to the other, "Cede me your wife, and I will cede you mine," and thus they exchanged their wives.

3. A third kind is this, that several men cohabited with one wife. When, then, she gave birth to a child, she declared who was the father; and if she did not know it, the fortune-tellers had to know it.

4. The *Nikâḥ-elmakt* (= *matrimonium exosum*), *i.e.* when a man married the widow of his father or of his son, the child of such a marriage was called *ḍaizan*. This is nearly the same as a certain Jewish marriage, for the Jews have the law that a man must marry the widow of his brother, if the latter has not left children, and create a line of descent for his deceased brother; and the offspring is considered as that of the deceased man, not as that of the real father. Thereby they want to prevent his memory dying out in the world. In Hebrew they call a man who is married in this way *Yâbhâm*.

Marriage among the ancient Iranians.

There was a similar institution among the Magians. In the book of Tausar, the great *herbadh*, addressed to Padashvâr-girshâh, as an answer to his attacks on Ardashîr the son of Bâbak, we find a description of the institution of a man's being married as the substitute for another man, which existed among the Persians. If a man dies without leaving male offspring, people are to examine the case. If he leaves a wife, they marry her to his nearest relative. If he does not leave a wife, they marry his daughter or the nearest related woman to the nearest related male of the family. If there is no woman of his family left, they woo by means of the money of the deceased a woman for his

family, and marry her to some male relative. The child of such a marriage is considered as the offspring of the deceased.

Whoever neglects this duty and does not fulfil it, kills innumerable souls, since he cuts off the progeny and the name of the deceased to all eternity.

We have here given an account of these things in order that the reader may learn by the comparative treatment of the subject how much superior the institutions of Islam are, and how much more plainly this contrast brings out all customs and usages, differing from those of Islam, in their essential foulness.

CHAPTER XI.

ABOUT THE BEGINNING OF IDOL-WORSHIP, AND A DESCRIPTION OF THE INDIVIDUAL IDOLS.

Origin of idol-worship in the nature of man.

It is well known that the popular mind leans towards the sensible world, and has an aversion to the world of abstract thought which is only understood by highly educated people, of whom in every time and every place there are only few. And as common people will only acquiesce in pictorial representations, many of the leaders of religious communities have so far deviated from the right path as to give such imagery in their books and houses of worship, like the Jews and Christians, and, more than all, the Manichæans. These words of mine would at once receive a sufficient illustration if, for example, a picture of the Prophet were made, or of Mekka and the Ka'ba, and were shown to an uneducated man or woman. Their joy in looking at the thing would bring them to kiss the picture, to rub their cheeks against it, and to roll themselves in the dust before it, as if they were seeing not the picture, but the original, and were in this way, as if they were present in the holy places, performing the rites of pilgrimage, the great and the small ones.

This is the cause which leads to the manufacture of idols, monuments in honour of certain much venerated persons, prophets, sages, angels, destined to keep alive their memory when they are absent or dead, to create for them a lasting place of grateful veneration in the hearts of men when they die. But when much time

passes by after the setting up of the monument, generations and centuries, its origin is forgotten, it becomes a matter of custom, and its veneration a rule for general practice. This being deeply rooted in the nature of man, the legislators of antiquity tried to influence them from this weak point of theirs. Therefore they made the veneration of pictures and similar monuments obligatory on them, as is recounted in historic records, both for the times before and after the Deluge. Some people even pretend to know that all mankind, before
Page 54. God sent them his prophets, were one large idolatrous body.

The followers of the Thora fix the beginning of idolatry in the days of Serûgh, the great-grandfather of Abraham. The Romans have, regarding this question,
Story of Romulus and Remus. the following tradition:—Romulus and Romanus (!), the two brothers from the country of the Franks, on having ascended the throne, built the city of Rome. Then Romulus killed his brother, and the consequence was a long succession of intestine troubles and wars. Finally, Romulus humiliated himself, and then he dreamt that there would only be peace on condition that he placed his brother on the throne. Now he got a golden image made of him, placed it at his side, and henceforward he used to say, "*We* (not *I*) have ordered thus and thus," which since has become the general use of kings. Thereupon the troubles subsided. He founded a feast and a play to amuse and to gain over those who bore him ill-will on account of the murder of his brother. Besides, he erected a monument to the sun, consisting of four images on four horses, the green one for the earth, the blue for the water, the red for the fire, and the white for the air. This monument is still in Rome in our days.

Idol-worship as restricted to the low classes of people. Since, however, here we have to explain the system and the theories of the Hindus on the subject, we shall now mention their ludicrous views; but we declare at once

that they are held only by the common uneducated people. For those who march on the path to liberation, or those who study philosophy and theology, and who desire abstract truth which they call *sâra*, are entirely free from worshipping anything but God alone, and would never dream of worshipping an image manufactured to represent him. A tradition illustrative of this is that which Śaunaka told the king Parîksha in these words:—

Story of King Ambarîsha and Indra.

There was once a king called Ambarîsha, who had obtained an empire as large as he had wished for. But afterwards he came to like it no longer; he retired from the world, and exclusively occupied himself with worshipping and praising God for a long time. Finally, God appeared to him in the shape of Indra, the prince of the angels, riding on an elephant. He spoke to the king: "Demand whatever you like, and I will give it you."

The king answered: "I rejoice in seeing thee, and I am thankful for the good fortune and help thou hast given; but I do not demand anything from thee, but only from him who created thee."

Indra said: "The object of worship is to receive a noble reward. Realise, therefore, your object, and accept the reward from him from whom hitherto you have obtained your wishes, and do not pick and choose, saying, 'Not from thee, but from another.'"

The king answered: "The earth has fallen to my lot, but I do not care for all that is in it. The object of my worship is to see the Lord, and that thou canst not give me. Why, therefore, should I demand the fulfilment of my desire from thee?"

Indra said: "The whole world and whoever is upon it are obedient to me. Who are you that you dare to oppose me?"

The king answered: "I, too, hear and obey, but I worship *him* from whom thou hast received this power,

who is the lord of the universe, who has protected thee against the attacks of the two kings, Bali and Hiraṇyâksha. Therefore let me do as *I* like, and turn away from me with my farewell greeting."

Indra said: "If you will absolutely oppose me, I will kill you and annihilate you."

The king answered: "People say that happiness is envied, but not so misfortune. He who retires from the world is envied by the angels, and therefore they will try to lead him astray. I am one of those who have retired from the world and entirely devoted themselves to worship, and I shall not give it up as long as
Page 55. I live. I do not know myself to be guilty of a crime for which I should deserve to be killed by thee. If thou killest me without any offence on my part, it is thy concern. What dost thou want from me? If my thoughts are entirely devoted to God, and nothing else is blended with them, thou art not able to do me any harm. Sufficient for me is the worship with which I am occupied, and now I return to it."

As the king now went on worshipping, the Lord appeared to him in the shape of a man of the grey lotus colour, riding on a bird called Garuḍa, holding in one of the four hands the *śaṅkha*, a sea-shell which people blow when riding on elephants; in the second hand the *cakra*, a round, cutting, orbicular weapon, which cuts everything it hits right through; in the third an amulet, and in the fourth *padma*, *i.e.* the red lotus. When the king saw him, he shuddered from reverence, prostrated himself and uttered many praises. The Lord quieted his terrified mind and promised him that he should obtain everything he wished for. The king spoke: "I had obtained an empire which nobody disputed with me; I was in conditions of life not troubled by sorrow or sickness. It was as if the whole world belonged to me. But then I turned away from it, after I had understood that the good of the

world is really bad in the end. I do not wish for anything except what I now have. The only thing I now wish for is to be liberated from this fetter."

The Lord spoke: "That you will obtain by keeping aloof from the world, by being alone, by uninterrupted meditation, and by restraining your senses to yourself."

The king spoke: "Supposing that I am able to do so through that sanctity which the Lord has deigned to bestow upon me, how should any other man be able to do so? for man wants eating and clothing, which connects him with the world. How is he to think of anything else?"

The Lord spoke: "Occupy yourself with your empire in as straightforward and prudent a way as possible: turn your thoughts upon me when you are engaged in civilising the world and protecting its inhabitants, in giving alms, and in everything you do. And if you are overpowered by human forgetfulness, make to yourself an image like that in which you see me; offer to it perfumes and flowers, and make it a memorial of me, so that you may not forget me. If you are in sorrow, think of me; if you speak, speak in my name; if you act, act for me."

The king spoke: "Now I know what I have to do in general, but honour me further by instructing me in the details."

The Lord spoke: "That I have done already. I have inspired your judge Vasishṭha with all that is required. Therefore rely upon him in all questions."

Then the figure disappeared from his sight. The king returned into his residence and did as he had been ordered.

From that time, the Hindus say, people make idols, some with four hands like the appearance we have described, others with two hands, as the story and description require, and conformably to the being which is to be represented.

Nârada and the voice from the fire.

Another story of theirs is the following:—Brahman had a son called Nârada, who had no other desire but that of seeing the Lord. It was his custom, when he walked about, to hold a stick. If he threw it down, it became a serpent, and he was able to do miracles with it. He never went without it. One day being engrossed in meditation on the object of his hopes, he saw a fire from afar. He went towards it, and then a voice spoke to him out of the fire: "What you demand and wish is impossible. You cannot see me save thus." When he looked in that direction, he saw a fiery appearance in something like human shape. Henceforward it has been the custom to erect idols of certain shapes.

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The idol of Multân called Âditya.

A famous idol of theirs was that of Multân, dedicated to the sun, and therefore called *Âditya*. It was of wood and covered with red Cordovan leather; in its two eyes were two red rubies. It is said to have been made in the last Kritayuga. Suppose that it was made in the very end of Kritayuga, the time which has since elapsed amounts to 216,432 years. When Muhammad Ibn Alḳâsim Ibn Almunabbih conquered Multân, he inquired how the town had become so very flourishing and so many treasures had there been accumulated, and then he found out that this idol was the cause, for there came pilgrims from all sides to visit it. Therefore he thought it best to have the idol where it was, but he hung a piece of cow's-flesh on its neck by way of mockery. On the same place a mosque was built. When then the Ḳarmatians occupied Multân, Jalam Ibn Shaibân, the usurper, broke the idol into pieces and killed its priests. He made his mansion, which was a castle built of brick on an elevated place, the mosque instead of the old mosque, which he ordered to be shut from hatred against anything that had been done under the dynasty of the Caliphs of the house of 'Umayya. When afterwards the blessed Prince Maḥ-

mûd swept away their rule from those countries, he made again the old mosque the place of the Friday-worship, and the second one was left to decay. At present it is only a barn-floor, where bunches of Ḥinnâ (*Lawsonia inermis*) are bound together.

If we now subtract from the above-mentioned number of years the hundreds, tens, and units, *i.e.* the 432 years, as a kind of arbitrary equivalent for the sum of about 100 years, by which the rise of the Ḳarmatians preceded our time, we get as the remainder 216,000 years for the time of the end of the Ḳritayuga, and about the epoch of the era of the Hijra. How, then, could wood have lasted such a length of time, and particularly in a place where the air and the soil are rather wet? God knows best!

The idol of Tâneshar called Cakra-svâmin.

The city of Tâneshar is highly venerated by the Hindus. The idol of that place is called *Cakrasvâmin*, *i.e.* the owner of the *cakra*, a weapon which we have already described (page 114). It is of bronze, and is nearly the size of a man. It is now lying in the hippodrome in Ghazna, together with the *Lord of Somanâth*, which is a representation of the *penis* of Mahâdeva, called *Linga*. Of Somanâth we shall hereafter speak in the proper place. This Cakrasvâmin is said to have been made in the time of Bhârata as a memorial of wars connected with this name.

The idol Śârada in Kashmîr.

In Inner Kashmîr, about two or three days' journey from the capital in the direction towards the mountains of Bolor, there is a wooden idol called *Śârada*, which is much venerated and frequented by pilgrims.

Quotation from the Saṁhitâ of Varâhamihira.

We shall now communicate a whole chapter from the book *Saṁhitâ* relating to the construction of idols, which will help the student thoroughly to comprehend the present subject.

Varâhamihira says: "If the figure is made to represent Râma the son of Daśaratha, or Bali the son of Virocana, give it the height of 120 digits," *i.e.* of *idol*

digits, which must be reduced by one-tenth to become *common digits*, in this case 108.

"To the idol of Vishṇu give eight hands, or four, or two, and on the left side under the breast give him the figure of the woman Śrî. If you give him eight hands, place in the right hands a sword, a club of gold or iron, an arrow, and make the fourth hand as if it were drawing water; in the left hands give him a shield, a bow, a *cakra*, and a conch.

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"If you give him four hands, omit the bow and the arrow, the sword and shield.

"If you give him two hands, let the right hand be drawing water, the left holding a conch.

"If the figure is to represent Baladeva, the brother of Nârâyaṇa, put earrings into his ears, and give him eyes of a drunken man.

"If you make both figures, Nârâyaṇa and Baladeva, join with them their sister *Bhagavatî* (Durgâ=Ekânanśâ), her left hand resting on her hip a little away from the side, and her right hand holding a lotus.

"If you make her four-handed, place in the right hands a rosary and a hand drawing water; in the left hands, a book and a lotus.

"If you make her eight-handed, place in the left hands the *kamaṇḍalu*, *i.e.* a pot, a lotus, bow and book; in the right hands, a rosary, a mirror, an arrow, and a water-drawing hand.

"If the figure is to represent Sâmba, the son of Vishṇu, put only a club in his right hand. If it is to represent Pradyumna, the son of Vishṇu, place in his right hand an arrow, in his left hand a bow. And if you make their two wives, place in their right hand a sword, in the left a buckler.

"The idol of Brahman has four faces towards the four sides, and is seated on a lotus.

"The idol of Skanda, the son of Mahâdeva, is a boy riding on a peacock, his hand holding a *śakti*, a weapon

like a double-edged sword, which has in the middle a pestle like that of a mortar.

"The idol Indra holds in its hand a weapon called *vajra* of diamond. It has a similar handle to the *śakti*, but on each side it has two swords which join at the handle. On his front place a third eye, and make him ride on a white elephant with four tusks.

"Likewise make on the front of the idol of Mahâdeva a third eye right above, on his head a crescent, in his hand a weapon called *śûla*, similar to the club but with three branches, and a sword; and let his left hand hold his wife Gaurî, the daughter of Himavant, whom he presses to his bosom from the side.

"To the idol Jina, *i.e.* Buddha, give a face and limbs as beautiful as possible, make the lines in the palms of his hands and feet like a lotus, and represent him seated on a lotus; give him grey hair, and represent him with a placid expression, as if he were the father of creation.

"If you make Arhant, the figure of another body of Buddha, represent him as a naked youth with a fine face, beautiful, whose hands reach down to the knees, with the figure of Śrî, his wife, under the left breast.

"The idol of Revanta, the son of the sun, rides on a horse like a huntsman.

"The idol of Yima, the angel of death, rides on a buffalo, and holds a club in his hand.

"The idol of Kubera, the treasurer, wears a crown, has a big stomach and wide hips, and is riding on a man.

"The idol of the sun has a red face like the pith of the red lotus, beams like a diamond, has protruding limbs, rings in the ears, the neck adorned with pearls which hang down over the breast, wears a crown of several compartments, holds in his hands two lotuses, and is clad in the dress of the Northerners which reaches down to the ankle.

"If you represent the Seven Mothers, represent several Page 58.
of them together in one figure, Brahmânî with four faces

towards the four directions, Kaumârî with six faces, Vaishṇavî with four hands, Vârâhî with a hog's head on a human body, Indrâṇî with many eyes and a club in her hand, Bhagavatî (Durgâ) sitting as people generally sit, Câmuṇḍâ ugly, with protruding teeth and a slim waist. Further join with them the sons of Mahâdeva, Kshetrapâla with bristling hair, a sour face, and an ugly figure, but Vinâyaka with an elephant's head on a human body, with four hands, as we have heretofore described."

The worshippers of these idols kill sheep and buffaloes with axes (*kuṭâra*), that they may nourish themselves with their blood. All idols are constructed according to certain measures determined by *idol-fingers* for every single limb, but sometimes they differ regarding the measure of a limb. If the artist keeps the right measure and does not make anything too large nor too small, he is free from sin, and is sure that the being which he represented will not visit him with any mishap. "If he makes the idol one cubit high and together with the throne two cubits, he will obtain health and wealth. If he makes it higher still, he will be praised.

"But he must know that making the idol too large, especially that of the Sun, will hurt the ruler, and making it too small will hurt the artist. If he gives it a thin belly, this helps and furthers the famine in the country; if he gives it a lean belly, this ruins property.

"If the hand of the artist slips so as to produce something like a wound, he will have a wound in his own body which will kill him.

"If it is not completely even on both sides, so that the one shoulder is higher than the other, his wife will perish.

"If he turns the eye upward, he will be blind for lifetime; if he turns it downward, he will have many troubles and sorrows."

If the statue is made of some precious stone, it is better than if it were made of wood, and wood is better than clay. "The benefits of a statue of precious stone will be common to all the men and women of the empire. A golden statue will bring power to him who erected it, a statue of silver will bring him renown, one of bronze will bring him an increase of his rule, one of stone the acquisition of landed property."

The Hindus honour their idols on account of those who erected them, not on account of the material of which they are made. We have already mentioned that the idol of Multân was of wood. *E.g.* the *linga* which Râma erected when he had finished the war with the demons was of sand, which he had heaped up with his own hand. But then it became petrified all at once, since the astrologically correct moment for the erecting of the monument fell before the moment when the workmen had finished the cutting of the stone monument which Râma originally had ordered. Regarding the building of the temple and its peristyle, the cutting of the trees of four different kinds, the astrological determination of the favourable moment for the erection, the celebration of the rites due on such an occasion, regarding all this Râma gave very long and tedious instructions. Further, he ordered that servants and priests to minister to the idols should be nominated from different classes of the people. "To the idol of Vishṇu are devoted the class called Bhâgavata; to the idol of the Sun, the Maga, *i.e.* the Magians; to the idol of Mahâdeva, a class of saints, anchorites with long hair, who cover their skin with ashes, hang on their persons the bones of dead people, and swim in the pools. The Brâhmaṇa are devoted to the Eight Mothers, the Shamanians to Buddha, to Arhant the class called *Nagnâ*. On the whole, to each idol certain people are devoted who constructed it, for those know best how to serve it." Page 59.

Quotations from *Gîtâ* showing that God is not to be confounded with the idols.

Our object in mentioning all this mad raving was to teach the reader the accurate description of an idol, if he happens to see one, and to illustrate what we have said before, that such idols are erected only for uneducated low-class people of little understanding; that the Hindus never made an idol of any supernatural being, much less of God; and, lastly, to show how the crowd is kept in thraldom by all kinds of priestly tricks and deceits. Therefore the book *Gîtâ* says: "Many people try to approach me in their aspirations through something which is different from me; they try to insinuate themselves into my favour by giving alms, praise, and prayer to something besides me. I, however, confirm and help them in all these doings of theirs, and make them attain the object of their wishes, because I am able to dispense with them."

In the same book Vâsudeva speaks to Arjuna: "Do you not see that most of those who wish for something address themselves in offering and worshipping to the several classes of *spiritual beings*, and to the sun, moon, and other celestial bodies? If now God does not disappoint their hopes, though he in no way stands in need of their worship, if he even gives them more than they asked for, and if he gives them their wishes in such a way as though they were receiving them from that to which they had addressed their prayers—viz. the idol—they will proceed to worship those whom they address, because they have not learned to know him, whilst *he*, by admitting this kind of intermediation, carries their affairs to the desired end. But that which is obtained by desires and intermediation is not lasting, since it is only as much as is deserved for any particular merit. Only that is lasting which is obtained from God alone, when people are disgusted with old age, death, and birth (and desire to be delivered therefrom by *Mokska*)."

This is what Vâsudeva says. When the ignorant crowd

get a piece of good luck by accident or something at which they had aimed, and when with this some of the preconcerted tricks of the priests are brought into connection, the darkness in which they live increases vastly, not their intelligence. They will rush to those *figures* of idols, maltreating their own figures before them by shedding their own blood and mutilating their own bodies.

The ancient Greeks, also, considered the idols as mediators between themselves and the *First Cause*, and worshipped them under the names of the stars and the highest substances. For they described the First Cause, not with positive, but only with negative predicates, since they considered it too high to be described by human qualities, and since they wanted to describe it as free from any imperfection. Therefore they could not address it in worship.

When the heathen Arabs had imported into their country idols from Syria, they also worshipped them, hoping that they would intercede for them with God.

Plato says in the fourth chapter of the *Book of Laws*: "It is necessary to any one who gives perfect honours (to the gods) that he should take trouble with the *mystery* of the gods and Sakînât, and that he should not make special idols masters over the ancestral gods. Further, it is the greatest duty to give honours as much as possible to the parents while they live."

By *mystery* Plato means a special kind of *devotion*. The word is much used among the Ṣâbians of Ḥarrân, the dualistic Manichæans, and the theologians of the Hindus.

Galenus says in the book *De Indole Animæ*: "At the time of the Emperor Commodus, between 500–510 years after Alexander, two men went to an idol-mer- Page 60.
chant and bargained with him for an idol of Hermes. The one wanted to erect it in a temple as a memorial of Hermes, the other wanted to erect it on a tomb as a

memorial of the deceased. However, they could not settle the business with the merchant, and so they postponed it until the following day. The idol-merchant dreamt the following night that the idol addressed him and spoke to him: 'O excellent man! I am thy work. I have received through the work of thy hands a figure which is thought to be the figure of a star. Now I am no longer a stone, as people called me heretofore; I am now known as Mercury. At present it stands in thy hands to make me either a memorial of something imperishable or of something that has perished already.'"

There is a treatise of Aristotle in which he answers certain questions of the Brahmins which Alexander had sent him. There he says: "If you maintain that some Greeks have fabled that the idols speak, that the people offer to them and think them to be spiritual beings, of all this we have no knowledge, and we cannot give a sentence on a subject we do not know." In these words he rises high above the class of fools and uneducated people, and he indicates by them that he does not occupy himself with such things. It is evident that the first cause of idolatry was the desire of commemorating the dead and of consoling the living; but on this basis it has developed, and has finally become a foul and pernicious abuse.

The former view, that idols are only memorials, was also held by the Caliph Mu'âwiya regarding the idols of Sicily. When, in the summer of A.H. 53, Sicily was conquered, and the conquerors sent him golden idols adorned with crowns and diamonds which had been captured there, he ordered them to be sent to Sind, that they should be sold there to the princes of the country; for he thought it best to sell them as objects costing sums of so-and-so many denars, not having the slightest scruple on account of their being objects of abominable idolatry, but simply considering the matter from a political, not from a religious point of view.

CHAPTER XII.

ON THE VEDA, THE PURÂṆAS, AND OTHER KINDS OF THEIR NATIONAL LITERATURE.

Sundry notes relating to the Veda.

VEDA means knowledge of that which was before unknown. It is a religious system which, according to the Hindus, comes from God, and was promulgated by the mouth of Brahman. The Brahmins recite the Veda without understanding its meaning, and in the same way they learn it by heart, the one receiving it from the other. Only few of them learn its explanation, and still less is the number of those who master the contents of the Veda and their interpretation to such a degree as to be able to hold a theological disputation.

The Brahmins teach the Veda to the Kshatriyas. The latter learn it, but are not allowed to teach it, not even to a Brahmin. The Vaiśya and Śûdra are not allowed to hear it, much less to pronounce and recite it. If such a thing can be proved against one of them, the Brahmins drag him before the magistrate, and he is punished by having his tongue cut off.

The Veda contains commandments and prohibitions, detailed statements about reward and punishment intended to encourage and to deter; but most of it contains hymns of praise, and treats of the various kinds of sacrifices to the fire, which are so numerous and difficult that you could hardly count them.

The Veda transmitted by memory.

They do not allow the Veda to be committed to writing, because it is recited according to certain modu-

lations, and they therefore avoid the use of the pen, since it is liable to cause some error, and may occasion an addition or a defect in the written text. In consequence it has happened that they have several times forgotten the Veda and lost it. For they maintain that the following passage occurs in the conversations between God and Brahman relating to the beginning of all things, according to the report of Śaunaka who had received it from the planet Venus: "You will forget the Veda at the time when the earth will be submerged; it will then go down to the depths of the earth, and none but the fish will be able to bring it out again. Therefore I shall send the fish, and it will deliver the Veda into your hands. And I shall send the boar to raise the earth with its tusks and to bring it out of the water."

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Further, the Hindus maintain that the Veda, together with all the rites of their religion and country, had been obliterated in the last Dvâpara-yuga, a period of time of which we shall speak in the proper place, until it was renewed by Vyâsa, the son of Parâśara.

The *Vishṇu Purâṇa* says: "At the beginning of each Manvantara period there will be created anew a lord of a period whose children will rule over the whole earth, and a prince who will be the head of the world, and angels to whom men will bring fire-offerings, and the *Great Bear*, who will renew the Veda which is lost at the end of each period."

Vasukra commits the Veda to writing.

This is the reason why, not long before our time, Vasukra, a native of Kashmîr, a famous Brahmin, has of his own account undertaken the task of explaining the Veda and committing it to writing. He has taken on himself a task from which everybody else would have recoiled, but he carried it out because he was afraid that the Veda might be forgotten and entirely vanish out of the memories of men, since he observed that the characters of men grew worse and worse, and

that they did not care much for virtue, nor even for duty.

There are certain passages in the Veda which, as they maintain, must not be recited within dwellings, since they fear that they would cause an abortion both to women and the cattle. Therefore they step out into the open field to recite them there. There is hardly a single verse free from such and similar minatory injunctions.

As we have already mentioned, the books of the Hindus are metrical compositions like the Rajaz poems of the Arabs. Most of them are composed in a metre called *śloka*. The reason of this has already been explained. Galenus also prefers metrical composition, and says in his book *Κατὰ γένη*: "The single signs which denote the weights of medicines become corrupt by being copied; they are also corrupted by the wanton mischief of some envious person. Therefore it is quite right that the books of Damocrates on medicines should be preferred to others, and that they should gain fame and praise, since they are written in a Greek metre. If all books were written in this way it would be the best;" the fact being that a prose text is much more exposed to corruption than a metrical one.

The Veda, however, is not composed in this common metre, śloka, but in another. Some Hindus say that no one could compose anything in the same metre. However, their scholars maintain that this is possible indeed, but that they refrain from trying it merely from veneration for the Veda.

The four pupils of Vyâsa and the four Vedas.

According to their tradition, Vyâsa divided it into four parts: *Rigveda*, *Yajurveda*, *Sâmaveda*, and *Atharvanaveda*.

Vyâsa had four *śishya*, *i.e.* pupils. He taught a separate Veda to each of them, and made him carry it in his memory. They are enumerated in the same order as the four parts of the Veda: *Paila*, *Vaiśampâyana*, *Jaimini*, *Sumantu*.

On the Rigveda.

Each of the four parts has a peculiar kind of recitation. The first is Ṛigveda, consisting of metrical compositions called *ṛic*, which are of different lengths. It is called Ṛigveda as being the totality of the *ṛic*.

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It treats of the sacrifices to the fire, and is recited in three different ways. First, in a uniform manner of reading, just as every other book is read. Secondly, in such a way that a pause is made after every single word. Thirdly, in a method which is the most meritorious, and for which plenty of reward in heaven is promised. First you read a short passage, each word of which is distinctly pronounced; then you repeat it together with a part of that which has not yet been recited. Next you recite the added portion alone, and then you repeat it together with the next part of that which has not yet been recited, &c., &c. Continuing to do so till the end, you will have read the whole text twice.

On the Yajurveda.

The Yajurveda is composed of *kâṇḍin*. The word is a derivative noun, and means *the totality of the kâṇḍin*. The difference between this and the Ṛigveda is that it may be read as a text connected by the rules of Saṁdhi, which is not allowed in the case of Ṛigveda. The one as well as the other treats of works connected with the fire and the sacrifices.

I have heard the following story about the reason why the Ṛigveda cannot be recited as a text connected by the rules of Saṁdhi:—

The story of Yâjnavalkya.

Yâjnavalkya stayed with his master, and his master had a Brahmin friend who wanted to make a journey. Therefore he asked the master to send somebody to his house to perform there during his absence the rites to *Homa*, *i.e.* to his fire, and to prevent it from being extinguished. Now the master sent his pupils to the house of his friend one after the other. So it came to be the turn of Yâjnavalkya, who was beautiful to look at and handsomely dressed. When he began the work which he was sent for, in a place where the wife of the

absent man was present, she conceived an aversion to his fine attire, and Yâjnavalkya became aware of it, though she concealed it. On having finished, he took the water to sprinkle it over the head of the woman, for this holds with them the place of the blowing after an incantation, since blowing is disliked by them and considered as something impure. Then the woman said, "Sprinkle it over this column." So he did, and at once the column became green. Now the woman repented having missed the blessing of his pious action; therefore on the following day she went to the master, asking him to send her the same pupil whom he had sent the day before. Yâjnavalkya, however, declined to go except in his turn. No urging had any effect upon him; he did not mind the wrath of his master, but simply said, "Take away from me all that you have taught me." And scarcely had he spoken the word, when on a sudden he had forgotten all he knew before. Now he turned to the Sun and asked him to teach him the Veda. The Sun said, "How is that possible, as I must perpetually wander, and you are incapable of doing the same?" But then Yâjnavalkya clung to the chariot of the Sun and began to learn the Veda from him; but he was compelled to interrupt the recitation here and there on account of the irregularity of the motion of the chariot.

Sâmaveda and Âtharvaṇaveda.

The Sâmaveda treats of the sacrifices, commandments, and prohibitions. It is recited in a tone like a chant, and hence its name is derived, because *sâman* means *the sweetness of recitation*. The cause of this kind of recital is, that Nârâyaṇa, when he appeared on earth in the shape of Vâmana, and came to the king Bali, changed himself into a Brahman and began to recite the Sâmaveda with a touching melody, by which he exhilarated the king, in consequence of which there happened to him the well-known story.

The Âtharvaṇaveda is as a text connected by the

rules of Sandhi. It does not consist of the same compositions as the Rig and Yajur Vedas, but of a third kind called *bhara*. It is recited according to a melody with a nasal tone. This Veda is less in favour with the Hindus than the others. It likewise treats of the sacrifices to the fire, and contains injunctions regarding the dead and what is to be done with them.

List of the Purâṇas.

As to the Purâṇas, we first mention that the word means *first, eternal*. There are eighteen Purâṇas, most of them called by the names of animals, human or

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angelic beings, because they contain stories about them, or because the contents of the book refer in some way to them, or because the book consists of answers which the creature whose name forms the title of the book has given to certain questions.

The Purâṇas are of human origin, composed by the so-called Ṛishis. In the following I give a list of their names, as I have heard them, and committed them to writing from dictation:—

1. *Âdi-purâṇa, i.e.* the first.
2. *Matsya-purâṇa, i.e.* the fish.
3. *Kûrma-purâṇa, i.e.* the tortoise.
4. *Varâha-purâṇa, i.e.* the boar.
5. *Narasiṁha-purâṇa, i.e.* a human being with a lion's head.
6. *Vâmana-purâṇa, i.e.* the dwarf.
7. *Vâyu-purâṇa, i.e.* the wind.
8. *Nanda-purâṇa, i.e.* a servant of Mahâdeva.
9. *Skanda-purâṇa, i.e.* a son of Mahâdeva.
10. *Âditya-purâṇa, i.e.* the sun.
11. *Soma-purâṇa, i.e.* the moon.
12. *Sâmba-purâṇa, i.e.* the son of Vishṇu.
13. *Brahmâṇḍa-purâṇa, i.e.* heaven.
14. *Mârkaṇḍeya-purâṇa, i.e.* a great Ṛishi.
15. *Târkshya-purâṇa, i.e.* the bird Garuḍa.
16. *Vishṇu-purâṇa, i.e.* Nârâyaṇa.
17. *Brahma-purâṇa, i.e.* the nature charged with the preservation of the world.
18. *Bhavishya-purâṇa, i.e.* future things.

Of all this literature I have only seen portions of the Matsya, Âditya, and Vâyu Purâṇas.

Another somewhat different list of the Purâṇas has been read to me from the *Vishṇu-Purâṇa*. I give it here *in extenso*, as in all questions resting on tradition it is the duty of an author to give those traditions as completely as possible:—

1. *Brahma.*
2. *Padma, i.e.* the red lotus.
3. *Vishṇu.*
4. *Śiva, i.e.* Mahâdeva.
5. *Bhâgavata, i.e.* Vâsudeva.
6. *Nârada, i.e.* the son of Brahma.
7. *Mârkaṇḍeya.*
8. *Agni, i.e.* the fire.
9. *Bhavishya, i.e.* the future.
10. *Brahmavaivarta, i.e.* the wind.
11. *Liṅga. i.e.* an image of the *αἰδοῖα* of Mahâdeva.
12. *Varâha.*
13. *Skanda.*
14. *Vâmana.*
15. *Kûrma.*
16. *Matsya, i.e.* the fish.
17. *Garuḍa, i.e.* the bird on which Vishṇu rides.
18. *Brahmâṇḍa.*

These are the names of the Purâṇas according to the *Vishṇu-Purâṇa.*

The book *Smṛiti* is derived from the Veda. It contains commandments and prohibitions, and is composed by the following twenty sons of Brahman:— A list of *Smṛiti* books.

1. Âpastamba.
2. Parâśara.
3. Śâtâtapa.
4. Saṁvarta.
5. Daksha.
6. Vasishṭha.
7. Aṅgiras.
8. Yama.
9. Vishṇu.
10. Manu.
11. Yâjnavalkya.
12. Atri.
13. Hâṛîta.
14. Likhita.
15. Śaṅkha.
16. Gautama.
17. Vṛihaspati.
18. Kâtyâyana.
19. Vyâsa.
20. Uśanas.

Besides, the Hindus have books about the jurisprudence of their religion, on theosophy, on ascetics, on the process of becoming god and seeking liberation

from the world, as, *e.g.* the book composed by Gauḍa the anchorite, which goes by his name; the book *Sâṁkhya*, composed by Kapila, on divine subjects; the book of *Patañjali*, on the search for liberation and for the union of the soul with the object of its meditation; the book *Nyâyabhâshâ*, composed by Kapila, on the Veda and its interpretation, also showing that it has been created, and distinguishing within the Veda between such injunctions as are obligatory only in certain cases, and those which are obligatory in general; further, the book *Mîmâṁsâ*, composed by Jaimini, on the same subject; the book *Laukâyata*, composed by Bṛihaspati, treating of the subject that in all investigations we must exclusively rely upon the apperception of
Page 64. the senses; the book *Agastyamata*, composed by Agastya, treating of the subject that in all investigations we must use the apperception of the senses as well as tradition; and the book *Vishnu-dharma*. The word *dharma* means *reward*, but in general it is used for *religion*; so that this title means *The religion of God*, who in this case is understood to be Nârâyaṇa. Further, there are the books of the six pupils of Vyâsa, viz. *Devala*, *Śukra*, *Bhârgava*, *Vṛihaspati*, *Yâjnavalkya*, and *Manu*. The Hindus have numerous books about all the branches of science. How could anybody know the titles of all of them, more especially if he is not a Hindu, but a foreigner?

Mahâ-bhârata. Besides, they have a book which they hold in such veneration that they firmly assert that everything which occurs in other books is found also in this book, but not all which occurs in this book is found in other books. It is called *Bhârata*, and composed by Vyâsa the son of Parâśara at the time of the great war between the children of Pâṇḍu and those of Kuru. The title itself gives an indication of those times. The book has 100,000 Ślokas in eighteen parts, each of which is called *Parvan*. Here we give the list of them:—

1. *Sabhâ-parva, i.e.* the king's dwelling.
2. *Aranya, i.e.* going out into the open field, meaning the exodus of the children of Pâṇḍu.
3. *Virâṭa, i.e.* the name of a king in whose realm they dwelt during the time of their concealment.
4. *Udyoga, i.e.* the preparing for battle.
5. *Bhishma.*
6. *Droṇa* the Brahmin.
7. *Karṇa* the son of the Sun.
8. *Śalya* the brother of *Duryodhana,* some of the greatest heroes who did the fighting, one *always* coming forward after his predecessor had been killed.
9. *Gadâ, i.e.* the club.
10. *Sauptika, i.e.* the killing of the sleepers, when Aśvatthâman the son of Droṇa attacked the city of Pâñcâla during the night and killed the inhabitants.
11. *Jalapradânika, i.e.* the successive drawing of water for the dead, after people have washed off the impurity caused by the touching of the dead.
12. *Strî, i.e.* the lamentations of the women.
13. *Śânti,* containing 24,000 Ślokas on eradicating hatred from the heart, in four parts:
    (1.) *Râjadharma,* on the reward of the kings.
    (2.) *Dânadharma,* on the reward for almsgiving.
    (3.) *Âpaddharma,* on the reward of those who are in need and trouble.
    (4). *Mokshadharma,* on the reward of him who is liberated from the world.
14. *Aśvamedha, i.e.* the sacrifice of the horse which is sent out together with an army to wander through the world. Then they proclaim in public that it belongs to the king of the world, and that he who does not agree thereto is to come forward to fight. The Brahmans follow the horse, and celebrate sacrifices to the fire in those places where the horse drops its dung.
15. *Mausala, i.e.* the fighting of the Yâdavas, the tribe of Vâsudeva, among themselves.
16. *Âśramavâsa, i.e.* leaving one's own country.
17. *Prasthâna, i.e.* quitting the realm to seek liberation.
18. *Svargârohaṇa, i.e.* journeying towards Paradise.

These eighteen parts are followed by another one which is called *Harivaṁśa-Parvan,* which contains the traditions relating to Vâsudeva.

In this book there occur passages which, like riddles, admit of manifold interpretations. As to the reason of Page 65.

this the Hindus relate the following story:—Vyâsa asked Brahman to procure him somebody who might write for him the *Bhârata* from his dictation. Now he intrusted with this task his son Vinâyaka, who is represented as an idol with an elephant's head, and made it obligatory on him never to cease from writing. At the same time Vyâsa made it obligatory on him to write only that which he understood. Therefore Vyâsa, in the course of his dictation, dictated such sentences as compelled the writer to ponder over them, and thereby Vyâsa gained time for resting awhile.

CHAPTER XIII.

THEIR GRAMMATICAL AND METRICAL LITERATURE.

List of books on grammar.

THE two sciences of grammar and metrics are auxiliary to the other sciences. Of the two, the former, grammar, holds the first place in their estimate, called *vyâkaraṇa*, *i.e.* the law of the correctness of their speech and etymological rules, by means of which they acquire an eloquent and classical style both in writing and reading. We Muslims cannot learn anything of it, since it is a branch coming from a root which is not within our grasp—I mean the language itself. That which I have been told as to titles of books on this science is the following:—

1. *Aindra*, attributed to Indra, the head of the angels.
2. *Cândra*, composed by Candra, one of the red-robe-wearing sect, the followers of Buddha.
3. *Śâkaṭa*, so called by the name of its author. His tribe, too, is called by a name derived from the same word, viz. *Śâkaṭâyana*.
4. *Pâṇini*, so called from its author.
5. *Kâtantra*, composed by Śarvavarman.
6. *Śaśidevavṛitti*, composed by Śaśideva.
7. *Durgavivṛitti*.
8. *Śishyahitâvṛitti*, composed by Ugrabhûti.

Shâh Ânandapâla and his master Ugrabhûti.

I have been told that the last-mentioned author was the teacher and instructor of Shâh Ânandapâla, the son of Jayapâla, who ruled in our time. After having composed the book he sent it to Kashmîr, but the people there did not adopt it, being in such things haughtily conservative. Now he complained of this to the Shâh, and

the Shâh, in accordance with the duty of a pupil towards his master, promised him to make him attain his wish. So he gave orders to send 200,000 *dirham* and presents of a similar value to Kashmîr, to be distributed among those who studied the book of his master. The consequence was that they all rushed upon the book, and would not copy any other grammar but this one, showing themselves in the baseness of their avarice. The book became the fashion and highly prized.

Tale relating to the origin of grammar.

Of the origin of grammar they give the following account:—One of their kings, called Samalvâhana, *i.e.* in the classical language, Sâtavâhana, was one day in a pond playing with his wives, when he said to one of them "*Mâudakaṁ dehi*," i.e. *do not sprinkle the water on me.* The woman, however, understood it as if he had said *modakaṁ dehi*, i.e. *bring sweetmeats.* So she went away and brought him sweetmeats. And when the king disapproved of her doing so, she gave him an angry reply, and used coarse language towards him. Now he was deeply offended, and, in consequence, as is their custom, he abstained from all food, and concealed himself in some corner until he was called upon by a sage, who consoled him, promising him that he would teach people grammar and the inflexions of the language. Thereupon the sage went off to Mahâdeva, praying, praising, and fasting devoutly. Mahâdeva appeared to him, and communicated to him some few rules, the like of which Abul'aswad Addu'alî has given for the Arabic language. The god also promised to assist him in the further development of this science. Then the sage returned to the king and taught it to him. This was the beginning of the science of grammar.

The predilection of the Hindus for metrical compositions.

Grammar is followed by another science, called *chandas, i.e.* the metrical form of poetry, corresponding to our metrics—a science indispensable to them, since all their books are in verse. By composing their books in metres they intend to facilitate their being learned

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by heart, and to prevent people in all questions of science ever recurring to a *written* text, save in a case of bare necessity. For they think that the mind of man sympathises with everything in which there is symmetry and order, and has an aversion to everything in which there is no order. Therefore most Hindus are passionately fond of their verses, and always desirous of reciting them, even if they do not understand the meaning of the words, and the audience will snap their fingers in token of joy and applause. They do not want prose compositions, although it is much easier to understand them.

Most of their books are composed in *Śloka*, in which I am now exercising myself, being occupied in composing for the Hindus a translation of the books of Euclid and of the Almagest, and dictating to them a treatise on the construction of the astrolabe, being simply guided herein by the desire of spreading science. If the Hindus happen to get some book which does not yet exist among them, they set at work to change it into *Ślokas*, which are rather unintelligible, since the metrical form entails a constrained, affected style, which will become apparent when we shall speak of their method of expressing numbers. And if the verses are not sufficiently affected, their authors meet with frowning faces, as having committed something like mere prose, and then they will feel extremely unhappy. God will do me justice in what I say of them.

Books on metrics.

The first who invented this art were Piṅgala and جلبت (? *C L T*). The books on the subject are numerous. The most famous of them is the book *Gaisita* (? G—AI—S—T), so called from its author, famous to such a degree that even the whole science of metrics has been called by this name. Other books are that of Mrigalâñchana, that of Piṅgala, and that of اوبانذ (? Û (Au)—L—Y—Â—N—D). I, however, have not seen any of these books, nor do I know much of the chapter

of the *Brahma-siddhânta* which treats of metrical calculations, and therefore I have no claim to a thorough knowledge of the laws of their metrics. Nevertheless, I do not think it right to pass by a subject of which I have only a smattering, and I shall not postpone speaking of it until I shall have thoroughly mastered it.

On the meaning of the technical terms *laghu* and *guru*.

In counting the syllables (*gaṇachandas*) they use similar figures to those used by Alkhalîl Ibn Aḥmad and our metricians to denote the *consonant without vowel* and the *consonant with vowel*, viz. these two signs, | and >, the former of which is called *laghu*, *i.e.* light; the latter, *guru*, *i.e.* heavy. In measuring (*mâtrâchandas*), the *guru* is reckoned double of a *laghu*, and its place may be filled by two *laghu*.

Further, they have a syllable which they call long (*dîrgha*), the measure or prosody of which is equal to that of a *guru*. This, I think, is a syllable with a long vowel (like *kâ*, *kî*, *kû*). Here, however, I must confess that up to the present moment I have not been able to gain a clear idea of the nature of both *laghu* and *guru*, so as to be able to illustrate them by similar elements in Arabic. However, I am inclined to think that *laghu* does *not* mean a *consonant without vowel*, nor *guru* a *consonant with vowel*, but that, on the contrary, *laghu* means a consonant with a short vowel (e.g. *ka*, *ki*, *ku*), and *guru* means the same with a vowelless consonant (e.g. *kat*, *kit*, *kut*), like an element in Arabic metrics called *Sabab* (*i.e.* – or ⏑⏑, a long syllable the place of which may be taken by two short ones). That which makes me doubt as to the first-mentioned definition of *laghu* is this circumstance, that the Hindus use *many laghu* one after the other in an uninterrupted succession. The Arabs are not capable of pronouncing two vowelless consonants one after the other, but in other languages this is possible. The Persian metricians, for instance, call such a consonant *moved by a light vowel* (*i.e.* pronounced with a sound like

the Hebrew Schwa). But, in any case, if such consonants are more than three in number, they are most difficult, nay, even impossible to pronounce; whilst, on the other hand, there is not the slightest difficulty in pronouncing an uninterrupted series of short syllables consisting of a consonant with a short vowel, as when you say in Arabic, "*Badanuka kamathali ṣifatika wafamuka bisa'ati shafatika*" (*i.e.* Thy body is like thy description, and thy mouth depends upon the width of thy lip). Further, although it is difficult to pronounce Page 67. a vowelless consonant at the beginning of a word, most nouns of the Hindus begin, if not exactly with vowelless consonants, still with such consonants as have only a Schwa-like vowel-sound to follow them. If such a consonant stands at the beginning of a verse, they drop it in counting, since the law of the *guru* demands that in it the vowelless consonant shall not *precede* but *follow* the vowel (*ka-t*, *ki-t*, *ku-t*).

Further, as our people have composed out of the *feet* (افاعيل) certain schemes or types, according to which verses are constructed, and have invented signs to denote the component parts of a foot, *i.e.* the consonant *with* and *without* a vowel, in like manner also the Hindus use certain names to denote the feet which are composed of *laghu* and *guru*, either the former preceding and the latter following or *vice versâ*, in such a way, however, that the *measure* must always be the same, whilst the *number* of syllables may vary. By these names they denote a certain conventional prosodic unity (*i.e.* certain *feet*). By *measure*, I mean that *laghu* is reckoned = one *mâtrâ*, *i.e.* measure, and *guru* = two *mâtrâ*. If they represent a foot in writing, they only express the *measure* of the syllables, not their number, as, *e.g.* (in Arabic) a double consonant (*kka*) is counted as a consonant *without* vowel *plus* a consonant *with* vowel, and a consonant followed by Tanwîn (*kun*) is counted as a consonant with a vowel *plus* a consonant

Definition of *mâtrâ*.

without vowel, whilst in writing both are represented as one and the same thing (*i.e.* by the sign of the consonant in question).

Names of *laghu* and *guru*.

Taken alone by themselves, *laghu* and *guru* are called by various names: the former, *la, kali, rûpa, câmara,* and *graha;* the latter, *ga, nêtra,* and a *half aṁśaka.* The latter name shows that a complete *aṁśaka* is equal to two *guru* or their equivalent. These names they have invented simply to facilitate the versification of their metrical books. For this purpose they have invented so many names, that one may fit into the metre if others will not.

The single feet.

The feet arising out of combinations of *laghu* and *guru* are the following:—

Twofold both in number and measure is the foot ||, *i.e.* two syllables and two *mâtrâ.*

Twofold in number, not in measure, are the feet, | < and < |; in measure they are = three *mâtrâ* | | | (but, in number, only two syllables).

The second foot < | (a trochee) is called *krittikâ.*

The quaternary feet are in each book called by different names:

<< *paksha, i.e.* the half month.
|| < *jvalana, i.e.* the fire.
| < | *madhya* (? *madhu*).
< || *parvata, i.e.* the mountain, also called *hâra* and *rasa.*
|||| *ghana, i.e.* the cube.

The feet consisting of five *mâtrâ* have manifold forms; those of them which have special names are the following:—

| << *hastin, i.e.* the elephant.
<| < *kâma, i.e.* the wish.
< < | (? lacuna).
||| < *kusuma.*

A foot consisting of six *mâtrâ* is <<<.

Some people call these feet by the names of the chess figures, viz.:

jvalana = the elephant.
madhya = the tower.
parvata = the pawn.
ghana = the horse.

In a lexicographical work to which the author هرود (? Haribhaṭṭa) has given his own name, the feet composed of three *laghu* or *guru* are called by single consonants, which in the following diagram are written on their left:— **On the arrangement of the feet. Quotation from Haribhaṭṭa.**

Diagram.

m < < < sixfold (*i.e.* containing six *mâtrâ*).
y | < < *hastin.*
r < | < *kâma.*
t < < | (? lacuna).
s | | < *jvalana.*
j | < | *madhya.*
bh < | | *parvata.*
n | | | threefold (*i.e.* containing three *mâtrâ*).

By means of these signs the author teaches how to construct these eight feet by an inductive method (a kind of algebraic permutation), saying:

"Place one of the two kinds (*guru* and *laghu*) in the first line unmixed (that would be < < <, if we begin with a *guru*). Then mix it with the second kind, and place one of this at the beginning of the second line, whilst the two other elements are of the first kind (| < <). Then place this element of admixture in the middle of the third line (< | <), and lastly at the end of the fourth line (< < |). Then you have finished the first half. Page 68.

"Further, place the second kind in the lowest line, unmixed (| | |), and mix up with the line above it one of the first kind, placing it at the beginning of the line (< | |), then in the middle of the next following line (| < |), and lastly at the end of the next following line (| | <). Then the second half is finished, and all the possible combinations of three *mâtra* have been exhausted."

1. < < <
2. | < <
3. < | <
4. < < |
} First half.

5. | | <
6. | < |
7. < | |
8. | | |
} Second half.

This system of composition or permutation is correct,

but his calculation showing how to find that place which every single foot occupies in this series of permutations is not in accordance with it. For he says:

"Place the numeral 2 to denote each element of a foot (*i.e.* both *guru* and *laghu*), once for all, so that every foot is represented by 2, 2, 2. Multiply the left (number) by the middle, and the product by the right one. If this *multiplier* (*i.e.* this number of the right side) is a *laghu*, then leave the product as it is; but if it is a *guru*, subtract *one* from the product."

The author exemplifies this with the sixth foot, *i.e.* | < |. He multiplies 2 by 2, and from the product (4) he subtracts 1. The remaining 3 he multiplies by the third 2, and he gets the product of 6.

This, however, is not correct for most of the feet, and I am rather inclined to believe that the text of the manuscript is corrupt.

The proper order of the feet would accordingly be the following:

	I.	II.	III.		I.	II.	III.
1.	<	<	<	5.	<	<	|
2.	|	<	<	6.	|	<	|
3.	<	|	<	7.	<	|	|
4.	|	|	<	8.	|	|	|

The *mixture* of the first line (No. I.) is such that one kind always follows the other. In the *second* line (No. II.) two of one kind are followed by two of the other; and in the third line (No. III.) four of one kind are followed by four of the other.

Then the author of the above-mentioned calculation goes on to say: "If the first element of the foot is a *guru*, subtract *one* before you multiply. If the multiplier is a *guru*, subtract one from the product. Thus you find the place which a foot occupies in this order."

On the *pâdas.*

As the Arabic verse is divided into two halves or hemistichs by the *ârûḍ*, *i.e.* the last foot of the first

hemistich, and the *darb*, *i.e.* the last foot of the second hemistich, in like manner the verses of the Hindus are divided into two halves, each of which is called *foot* (*pâda*). The Greeks, too, call them *feet* (*lacuna*),—those words which are composed of it, συλλάβη, and the consonants *with* or *without* vowels, with long, short, or doubtful vowels.

On the metre Âryâ.

The verse is divided into three, or more commonly into four *pâda*. Sometimes they add a fifth *pâda* in the middle of the verse. The *pâdas* have no rhyme, but there is a kind of metre, in which the 1 and 2 *pâdas* end with the same consonant or syllable as if rhyming on it, and also the *pâdas* 3 and 4 end with the same consonant or syllable. This kind is called *Âryâ*. At the end of the *pâda* a *laghu* may become a *guru*, though in general this metre ends with a *laghu*.

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The different poetical works of the Hindus contain a great number of metres. In the metre of 5 *pâda*, the fifth *pâda* is placed between *pâdas* 3 and 4. The names of the metres differ according to the number of syllables, and also according to the verses which follow. For they do not like all the verses of a long poem to belong to one and the same metre. They use many metres in the same poem, in order that it should appear like an embroidered piece of silk.

The construction of the four *pâdas* in the four-*pâda* metre is the following:—

Pâda I.	⏑ ⏑ paksha = 1 aṁśuka. ⏑ | | parvata. | | ⏑ jvalana.	⏑ ⏑ paksha. ⏑ | | parvata. ⏑ ⏑ paksha.	Pâda III.
Pâda II.	⏑ ⏑ paksha. | | ⏑ jvalana. | ⏑ | madhya. ⏑ | | parvata. ⏑ ⏑ paksha.	⏑ ⏑ paksha. | | ⏑ jvalana. | ⏑ | madhya. ⏑ | | parvata. | | ⏑ jvalana.	Pâda IV.

This is a representation of a species of their metres, called *Skandha*, containing four *pâda*. It consists of two halves, and each half has eight *aṁśaka*.

Of the single *aṁśaka*, the 1st, 3d, and 5th can never be a *madhya*, *i.e.* $|<|$, and the 6th must always be either a *madhya* or a *ghana*. If this condition is adhered to, the other *aṁśakas* may be anything at all, just as accident or the fancy of the poet wills it. However, the metre must always be complete, neither more nor less. Therefore, observing the rules as to the formation of certain *aṁśakas* in the single *pâdas*, we may represent the four *pâdas* in the following manner:—

Pâda I. $<<\quad<||\quad||<$.
Pâda II. $<<\quad||<\quad|<|\quad<||\quad<<$.
Pâda III. $<<\quad<||\quad<<$.
Page 70. Pâda IV. $<<\quad|<<\quad|<|\quad<||\quad||<$.

According to this pattern the verse is composed.

Arab and Hindu notation of a metre.

If you represent an Arabic metre by these signs of the Hindus, you will find that they mean something entirely different from what the Arabic signs mean which denote a consonant *with* a short vowel and a consonant *without* a vowel. (The Arabic sign ـْ means a consonant without a vowel; the Hindu sign | means a short syllable; the Arabic sign ـَ means a consonant followed by a short vowel; the Hindu sign < means a long syllable.) As an example, we give a representation of the regular complete *Khafif* metre, representing each foot by derivations of the root فعل.

Metrum Khafif.

(1.) فَاعِلَاتُن مُسْتَفْعِلُن فَاعِلَاتُن.

represented by derivations of the root فعل.

(2.) $|o|oo|o\qquad|oo|o|o\qquad|o|oo|o$.

represented by Arabic signs.

(3.) $<<|<\qquad<|<<\qquad<<|<$,

represented by the signs of the Hindus.

We give the latter signs in an inverted order, since the Hindus read from the left to the right.

I have already once pleaded as my excuse, and do so here a second time, that my slender knowledge of this science does not enable me to give the reader a complete insight into the subject. Still I take the greatest pains with it, though I am well aware that it is only very little I can give.

On the metre *Vṛitta*.

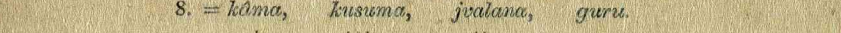
The name *Vṛitta* applies to each four-*pâda* metre in which the signs of both the prosody and the number of the syllables are like each other, according to a certain correspondence of the *pâdas* among themselves, so that if you know one *pâda*, you know also the other ones, for they are like it. Further, there is a law that a *pâda* cannot have less than four syllables, since a *pâda* with less does not occur in the Veda. For the same reason the smallest number of the syllables of a *pâda* is four, the largest twenty-six. In consequence, there are twenty-three varieties of the *Vṛitta* metre, which we shall here enumerate:—

1. The *pâda* has four *heavy* syllables (*guru*), and here you *cannot* put two *laghu* in the place of one *guru*.
2. The nature of the second kind of the *pâda* is not clear to me, so I omit it.
3. This *pâda* is built of
   ghana + *paksha*.
   | | | | < <
4. = 2 *guru* + 2 *laghu* + 3 *guru*.
   < < | | < < <
   It would be better to describe this *pâda* as = *paksha* + *jvalana* + *paksha*.
5. = 2 *krittikâ* + *jvalana* + *paksha*.
   < | < | | | < < <
6. = *ghana* + *madhya* + *paksha*. Page 71.
   | | | | | < | < <
7. = *ghana* + *parvata* + *jvalana*.
   | | | | < | | | | <

8. = *kâma*, *kusuma*, *jvalana*, *guru*.

9. = *paksha*, *hastin*, *jvalana*, *madhya*, 2 *guru*.

10. = *paksha*, *parvata*, *jvalana*, *madhya*, *paksha*.



11. = *paksha*, *madhya*, 2 *jvalana*, *hastin*.

12. = *ghana*, *jvalana*, *paksha*, 2 *hastin*.

13. = *parvata*, *kâma*, *kusuma*, *madhya*, *jvalana*.

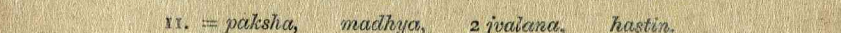
14. = *hastin*, *paksha*, *parvata*, *kusuma*, *parvata*, *laghu*, *guru*.

15. = 2 *paksha*, *parvata*, *kusuma*, 2 *kâma*, *guru*.

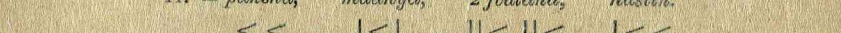
16. = *paksha*, *parvata*, *kâma*, *kusuma*, *paksha*, *laghu*, *guru*.

17. = 2 *paksha*, *parvata*, *ghana*, *jvalana*, *paksha*, *kusuma*.

18. = 2 *paksha*, *parvata*, *ghana*, *jvalana*, 2 *kâma*, *guru*.

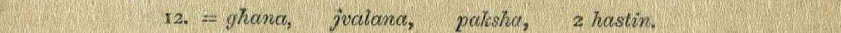


19. = *guru*, 2 *paksha*, *parvata*, *ghana*, *jvalana*, 2 *kâma*, *guru*.



20. = 4 *paksha*, *jvalana*, *madhya*, *paksha*, 2 *madhya*, *guru*.

21. = 4 *paksha*, 3 *jvalana*, 2 *madhya*, *guru*.



22. = 4 *paksha*, *kusuma*, *madhya*, *jvalana*, 2 *madhya*, *guru*.

23. = 8 *guru*, 10 *laghu*, *kâma*, *jvalana*, *laghu*, *guru*.

We have given such a lengthy account, though it be only of scanty use, in order that the reader may see for himself the example of an accumulation of *laghus*, which shows that *laghu* means *a consonant followed by a short vowel*, not a consonant without a vowel. Further, he will thereby learn the way in which they represent a metre and the method of their scanning a verse. Lastly, he will learn that Alkhalîl Ibn Aḥmad exclusively drew from his own genius when he invented the Arabic metrics, though, possibly, he may have heard, as some people think, that the Hindus use certain metres in their poetry. If we here take so much trouble with Indian metrics, we do it for the purpose of fixing the laws of the Śloka, since most of their books are composed in it.

Theory of the Śloka.

The *Śloka* belongs to the four-*pâda* metres. Each *pâda* has eight syllables, which are different in all four *pâdas*. The last syllable of each of the four *pâdas* must be the same, viz. a *guru*. Further, the fifth syllable in each *pâda* must always be *laghu*, the sixth syllable *guru*. The seventh syllable must be *laghu* in the second and fourth *pâda*, *guru* in the first and third *pâdas*. The other syllables are entirely dependent upon accident or the writer's fancy.

Quotation from Brahmagupta.

In order to show in what way the Hindus use arithmetic in their metrical system, we give in the following a quotation from Brahmagupta: "The first kind of poetry is *gâyatrî*, a metre consisting of two *pâdas*. If we now suppose that the number of the syllables of this metre may be 24, and that the smallest number of the syllables of one *pâda* is 4, we describe the two *pâdas* by 4 + 4, representing their smallest possible number of syllables. As, however, their largest possible number is 24, we add the difference between these 4 + 4 and 24, *i.e.* 16, to the right-side number, and get 4 + 20. If the metre had three *pâdas*, it would be represented by 4 + 4 + 16. The right-side

pâda is always distinguished from the others and called by a separate name; but the preceding *pâdas* also are connected, so as to form one whole, and likewise called by a separate name. If the metre had four *pâdas*, it would be represented by 4 + 4 + 4 + 12.

"If, however, the poet does not use the *pâdas* of 4, *i.e.* the smallest possible number of syllables, and if we
Page 72. want to know the number of combinations of the 24 syllables which may occur in a two-*pâda* metre, we write 4 to the left and 20 to the right; we add 1 to 4, again 1 to the sum, &c.; we subtract 1 from 20, again 1 from the remainder, &c.; and this we continue until we get both the same numbers with which we commenced, the small number in the line which commenced with the greater number, and the greater number in the line which commenced with the small number. See the following scheme:—

4	20
5	19
6	18
7	17
8	16
9	15
10	14
11	13
12	12
13	11
14	10
15	9
16	8
17	7
18	6
19	5
20	4

The number of these combinations is 17, *i.e.* the difference between 4 and 20 *plus* 1.

"As regards the three-*pâda* metre with the presupposed number of syllables, *i.e.* 24, its first species is

that in which all three *pâdas* have the smallest possible number of syllables, *i.e.* 4 + 4 + 16.

"The right-side number and the middle number we write down as we have done with the *pâdas* of the two-*pâda* metre, and we make with them the same calculation as we have done above. Besides, we add the left-side number in a separate column, but do not make it undergo any changes. See the following scheme:—

4	4	16
4	5	15
4	6	14
4	7	13
4	8	12
4	9	11
4	10	10
4	11	9
4	12	8
4	13	7
4	14	6
4	15	5
4	16	4

"This gives the number of 13 permutations, but by changing the places of the numbers forwards and backwards in the following method, the number may be increased sixfold, *i.e.* to 78:—

"I. The right-side number keeps its place; the two other numbers exchange their places, so that the middle number stands at the left side; the left-side number occupies the middle:—

I.

4	4	16
5	4	15
6	4	14
7	4	13 &c.

"II.–III. The right-side number is placed in the middle between the other two numbers, which first keep their

original places, and then exchange them with each other:—

II.

4	16	4
4	15	5
4	14	6
4	13	7 &c.

III.

4	16	4
5	15	4
6	14	4
7	13	4 &c.

"IV.–V. The right-side number is placed to the left, and the other two numbers first keep their original places, and then exchange them with each other:—

IV.

16	4	4
15	4	5
14	4	6
13	4	7 &c.

V.

16	4	4
15	5	4
14	6	4
13	7	4 &c.

"Because, further, the numbers of the syllables of a *pâda* rise like the square of 2, for after 4 follows 8, we may represent the syllables of the three *pâdas* in this way: 8+8+8(=4+4+16). However, their arithmetical peculiarities follow another rule. The four-*pâda* metre follows the analogy of the three-*pâda* metre."

Of the above-mentioned treatise of Brahmagupta I have only seen a single leaf: it contains, no doubt, important elements of arithmetic. God affords help

and sustains by his mercy, *i.e.* I hope one day to learn those things. As far as I can guess with regard to the literature of the Greeks, they used in their poetry similar *feet* to the Hindus; for Galenus says in his book κατὰ γένη: "The medicine prepared with saliva dis- Page 73.
covered by Menecrates has been described by Damocrates in a poem composed in a metre consisting of three parts."

CHAPTER XIV.

HINDU LITERATURE IN THE OTHER SCIENCES, ASTRONOMY, ASTROLOGY, ETC.

Times unfavourable to the progress of science.

THE number of sciences is great, and it may be still greater if the public mind is directed towards them at such times as they are in the ascendancy and in general favour with all, when people not only honour science itself, but also its representatives. To do this is, in the first instance, the duty of those who rule over them, of kings and princes. For they alone could free the minds of scholars from the daily anxieties for the necessities of life, and stimulate their energies to earn more fame and favour, the yearning for which is the pith and marrow of human nature.

The present times, however, are not of this kind. They are the very opposite, and therefore it is quite impossible that a new science or any new kind of research should arise in our days. What we have of sciences is nothing but the scanty remains of bygone better times.

If a science or an idea has once conquered the whole earth, every nation appropriates part of it. So do also the Hindus. Their belief about the cyclical revolutions of times is nothing very special, but is simply in accordance with the results of scientific observation.

On the Siddhántas.

The science of astronomy is the most famous among them, since the affairs of their religion are in various ways connected with it. If a man wants to gain the title of an astronomer, he must not only know scientific

or mathematical astronomy, but also astrology. The book known among Muslims as *Sindhind* is called by them *Siddhânta*, i.e. *straight*, not crooked nor changing. By this name they call every standard book on astronomy, even such books as, according to our opinion, do not come up to the mark of our so-called *Zîj*, *i.e.* handbooks of mathematical astronomy. They have five Siddhântas:—

I. *Sûrya-siddhânta*, *i.e.* the Siddhânta of the sun, composed by Lâṭa.

II. *Vasishṭha-siddhânta*, so called from one of the stars of the Great Bear, composed by Vishṇucandra.

III. *Pulisa-siddhânta*, so called from Paulisa, the Greek, from the city of Saintra, which I suppose to be Alexandria, composed by Pulisa.

IV. *Romaka-siddhânta*, so called from the Rûm, *i.e.* the subjects of the Roman Empire, composed by Śrîsheṇa.

V. *Brahma-siddhânta*, so called from Brahman, composed by Brahmagupta, the son of Jishṇu, from the town of Bhillamâla between Multân and Anhilwâra, 16 *yojana* from the latter place (?).

The authors of these books draw from one and the same source, the book *Paitâmaha*, so called from *the first father*, *i.e.* Brahman.

Varâhamihira has composed an astronomical handbook of small compass called *Pañca-siddhântikâ*, which name ought to mean that it contains the pith and marrow of the preceding five Siddhântas. But this is not the case, nor is it so much better than they as to be called the most correct one of the five. So the name does not indicate anything but the fact that the number of Siddhântas is five.

Brahmagupta says: "Many of the Siddhântas are Sûrya, others Indu, Pulisa, Romaka, Vasishṭha, and Yavana, *i.e.* the Greeks; and though the Siddhântas are many, they differ only in words, not in the subject-

matter. He who studies them properly will find that they agree with each other."

Up to the present time I have not been able to procure any of these books save those of Pulisa and of Brahmagupta. I have commenced translating them, but have not yet finished my work. Meanwhile I shall
Page 74. give here a table of contents of the *Brahma-siddhânta*, which in any case will be useful and instructive.

Contents of the *Brahma-siddhânta*.

Contents of the twenty-four chapters of the *Brahma-siddhânta* —

1. On the nature of the globe and the figure of heaven and earth.

2. On the revolutions of the planets; on the calculation of time, *i.e.* how to find the time for different longitudes and latitudes; how to find the mean places of the planets; how to find the sine of an arc.

3. On the correction of the places of the planets.

4. On three problems: how to find the shadow, the bygone portion of the day and the *ascendens*, and how to derive one from the other.

5. On the planets becoming visible when they leave the rays of the sun, and their becoming invisible when entering them.

6. On the first appearance of the moon, and about her two cusps.

7. On the lunar eclipse.

8. On the solar eclipse.

9. On the shadow of the moon.

10. On the meeting and conjunction of the planets.

11. On the latitudes of the planets.

12. A critical investigation for the purpose of distinguishing between correct and corrupt passages in the texts of astronomical treatises and handbooks.

13. On arithmetic; on plane measure and cognate subjects.

14. Scientific calculation of the mean places of the planets.

15. Scientific calculation of the correction of the places of the planets.

16. Scientific calculation of the three problems (v. chap. 4).

17. On the deflection of eclipses.

18. Scientific calculation of the appearance of the new moon and her two cusps.

19. On *Kuṭṭaka, i.e.* the pounding of a thing. The pounding of oil-producing substances is here compared with *the most minute and detailed research.* This chapter treats of algebra and related subjects, and besides it contains other valuable remarks of a more or less arithmetical nature.

20. On the shadow.

21. On the calculation of the measures of poetry and on metrics.

22. On cycles and instruments of observation.

23. On time and the four measures of time, the *solar*, the *civil*, the *lunar*, and the *sidereal.*

24. About numeral notation in the metrical books of this kind.

These, now, are twenty-four chapters, according to his own statement, but there is a twenty-fifth one, called *Dhyâna-graha-adhyâya*, in which he tries to solve the problems by speculation, not by mathematical calculation. I have not enumerated it in this list, because the pretensions which he brings forward in this chapter are repudiated by mathematics. I am rather inclined to think that that which he produces is meant to be the *ratio metaphysica* of all astronomical methods, otherwise how could any problem of this science be solved by anything save by mathematics ?

On the literature of Tantras and Karaṇas.

Such books as do not reach the standard of a Siddhânta are mostly called *Tantra* or *Karaṇa.* The former means *ruling under a governor*, the latter means *following, i.e.* following behind the Siddhânta. Under *governors* they understand the *Âcâryas, i.e.* the sages, anchorites, the followers of Brahman.

There are two famous *Tantras* by *Âryabhaṭa* and *Balabhadra*, besides the *Rasâyana-tantra* by *Bhânuyaśas* (?). About what Rasâyana means we shall give a separate chapter (chap. xvii.)

As for *Karaṇas*, there is one (*lacuna*) called by his name, besides the *Karaṇa-khaṇḍa-khâdyaka* by Brahmagupta. The last word, *khaṇḍa*, means a kind of their sweetmeats. With regard to the reason why he gave his book this title, I have been told the following:—

Sugrîva, the Buddhist, had composed an astronomical handbook which he called *Dadhi-sâgara*, *i.e.* the sea of sour-milk; and a pupil of his composed a book of the same kind which he called *Kûra-babayâ* (?), *i.e.* a mountain of rice. Afterwards he composed another book which he called *Lavaṇa-mushṭi*, *i.e.* a handful of salt. Therefore Brahmagupta called his book the *Sweetmeat—khâdyaka*—in order that all kinds of victuals (sour-milk, rice, salt, &c.) should occur in the titles of the books on this science.

The contents of the book *Karaṇa-khaṇḍa-khâdyaka* represent the doctrine of Âryabhaṭa. Therefore Brahmagupta afterwards composed a second book, which he called *Uttara-khaṇḍa-khâdyaka*, *i.e.* the explanation of the *Khaṇḍa-khâdyaka*. And this book is again followed by another one called *Khaṇḍa-khâdyaka-tippâ* (*sic*), of which I do not know whether it is composed by Brahmagupta or somebody else. It explains the reasons and the nature of the calculations employed in the *Khaṇḍa-khâdyaka*. I suppose it is a work of Balabhadra's.

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Further, there is an astronomical handbook composed by Vijayanandin, the commentator, in the city of Benares, entitled *Karaṇa-tilaka*, *i.e.* the blaze on the front of the Karaṇas; another one by Vitteśvara the son of Bhadatta (? Mihdatta), of the city of Nâgarapura, called *Karaṇa-sâra*, *i.e.* that which has been derived

from the Karaṇa; another one, by Bhânuyaśas (?), is called *Karaṇa-para-tilaka*, which shows, as I am told, how the corrected places of the stars are derived from one another.

There is a book by Utpala the Kashmirian called *Râhunrâkaraṇa* (?), *i.e.* breaking the Karaṇas; and another called *Karaṇa-pâta*, *i.e.* killing the Karaṇas. Besides there is a book called *Karaṇa-cûḍâmaṇi* of which I do not know the author.

There are more books of the same kind with other titles, *e.g.* the great *Mânasa*, composed by Manu, and the commentary by Utpala; the small *Mânasa*, an epitome of the former by Puñcala (?), from the southern country; *Daśagîtikâ*, by Âryabhaṭa; *Âryâshṭaśata*, by the same; *Lokânanda*, so called from the name of the author; *Bhaṭṭila* (?), so called from its author, the Brahman Bhaṭṭila. The books of this kind are nearly innumerable.

On astrological literature, the so-called Saṁhitâs.

As for astrological literature, each one of the following authors has composed a so-called *Saṁhitâ*, viz. :—

Mâṇḍavya.	Balabhadra.
Parâśara.	Divyatattva.
Garga.	Varâhamihira.
Brahman.	

Saṁhitâ means *that which is collected*, books containing something of everything, *e.g.* forewarnings relating to a journey derived from meteorological occurrences; prophecies regarding the fate of dynasties; the knowledge of lucky and unlucky things; prophesying from the lines of the hand; interpretation of dreams, and taking auguries from the flight or cries of birds. For Hindu scholars believe in such things. It is the custom of their astronomers to propound in their Saṁhitâs also the whole science of meteorology and cosmology.

The Jâtakas, *i.e.* books on nativities.

Each one of the following authors has composed a book, *Jâtaka*, *i.e.* book of nativities, viz. :—

Parâśara.	Jîvaśarman.
Satya.	Mau, the Greek.
Maṇittha.	

Varâhamihira has composed two Jâtakas, a small and a large one. The latter of these has been explained by Balabhadra, and the former I have translated into Arabic. Further, the Hindus have a large book on the science of the astrology of nativities called *Sârâvalî*, *i.e.* the chosen one, similar to the *Vazîdaj* (= Persian *guzîda* ?), composed by Kalyâṇa-Varman, who gained high credit for his scientific works. But there is another book still larger than this, which comprehends the whole of astrological sciences, called *Yavana*, *i.e.* belonging to the Greeks.

Of Varâhamihira there are several small books, *e.g.* *Shaṭ-pañcâśikâ*, fifty-six chapters on astrology; *Horâ-pañca-hotṛiya* (?), on the same subject.

Travelling is treated of in the book *Yogayâtrâ* and the book *Tikanî(?)-yâtrâ*, marriage and marrying in the book *Vivâha-paṭala*, architecture in the book (*lacuna*).

The art of taking auguries from the flight or cries of birds, and of the foretelling by means of piercing a needle into a book, is propounded in the work called *Srudhava* (? śrotavya), which exists in three different copies. Mahâdeva is said to be the author of the first, Vimalabuddhi the author of the second, and Baṅgâla the author of the third. Similar subjects are treated in the book *Gûḍhâmana* (?), *i.e.* the knowledge of the unknown, composed by Buddha, the originator of the sect of the red robe-wearers, the Shamanians; and in the book *Praśna Gûḍhâmana* (?), *i.e.* questions of the science of the unknown, composed by Utpala.

Page 76. Besides, there are Hindu scholars of whom we know the names, but not the title of any book of theirs, viz.:—

Pradyumna.	Sârasvata.
Saṅgahila (Śṛiṅkhala ?).	Piruvâna (?).
Divâkara.	Devakîrtti.
Parêśvara.	Pṛithûdaka-svâmin.

Medical literature. Medicine belongs to the same class of sciences as astronomy, but there is this difference, that the latter

stands in close relation to the religion of the Hindus. They have a book called by the name of its author, *i.e. Caraka*, which they consider as the best of their whole literature on medicine. According to their belief, Caraka was a Rishi in the last Dvâpara-yuga, when his name was *Agniveśa*, but afterwards he was called *Caraka, i.e.* the intelligent one, after the first elements of medicine had been laid down by certain Ṛishis, the children of *Sûtra*. These latter had received them from Indra, Indra from Aśvin, one of the two physicians of the Devas, and Aśvin had received them from Prajâpati, *i.e.* Brahman, *the first father*. This book has been translated into Arabic for the princes of the house of the Barmecides.

On Pañcatantra.

The Hindus cultivate numerous other branches of science and literature, and have a nearly boundless literature. I, however, could not comprehend it with my knowledge. I wish I could translate the book *Pañcatantra*, known among us as the book of Kalîla and Dimna. It is far spread in various languages, in Persian, Hindî, and Arabic—in translations of people who are not free from the suspicion of having altered the text. For instance, 'Abdallâh Ibn Almukaffa' has added in his Arabic version the chapter about Barzôya, with the intention of raising doubts in the minds of people of feeble religious belief, and to gain and prepare them for the propagation of the doctrines of the Manichæans. And if he is open to suspicion in so far as he has added something to the text which he had simply to translate, he is hardly free from suspicion in his capacity as translator.

CHAPTER XV.

NOTES ON HINDU METROLOGY, INTENDED TO FACILITATE THE UNDERSTANDING OF ALL KINDS OF MEASUREMENTS WHICH OCCUR IN THIS BOOK.

The Hindu system of weights.

COUNTING is innate to man. The measure of a thing becomes known by its being compared with another thing which belongs to the same species and is assumed as a unit by general consent. Thereby the difference between the object and this standard becomes known.

By weighing, people determine the amount of gravity of heavy bodies, when the tongue of the scales stands at right angles on the horizontal plane. Hindus want the scales very little, because their *dirhams* are determined by number, not by weight, and their fractions, too, are simply counted as so-and-so many *fulûs*. The coinage of both *dirhams* and *fulûs* is different according to towns and districts. They weigh gold with the scales only when it is in its natural state or such as has been worked, *e.g.* for ornaments, but not coined. They use as a weight of gold the *suvarṇa* = $1\frac{1}{3}$ *tola*. They use the *tola* as frequently as we use the *mithkâl*. According to what I have been able to learn from them, it corresponds to three of our *dirhams*, of which 10 equal 7 *mithkâl*.

Therefore 1 *tola* = $2\frac{1}{10}$ of our *mithkâl*.

The greatest fraction of a *tola* is $\frac{1}{12}$, called *mâsha*. Therefore 16 *mâsha* = 1 *suvarṇa*.

Further,

1 *mâsha* = 4 *andî* (*eraṇḍa*), *i.e.* the seed of a tree called *Gaura*.
1 *andî* = 4 *yava*.
1 *yava* = 6 *kalâ*.
1 *kalâ* = 4 *pâda*.
1 *pâda* = 4 *mâṛî* (?).

Arranged differently we have—

1 *suvarṇa* = 16 *mâsha* = 64 *andî* = 256 *yava* = 1600 *kalâ* = 6400 *pâda* = 25,600 *mâṛî* (?).

Six *máshas* are called 1 *dranḱshaṇa*. If you ask them about this weight, they tell you that 2 *dranḱshaṇa* = 1 *mithḳâl*. But this is a mistake; for 1 *mithḳâl* = $5\frac{5}{7}$ *mâsha*. The relation between a *dranḱshaṇa* and a *mithḳâl* is as 20 to 21, and therefore 1 *dranḱshaṇa* = $1\frac{1}{20}$ *mithḳâl*. If, therefore, a man gives the answer which we have just mentioned, he seems to have in mind the notion of a *mithḳâl* as a weight which does not much differ from a *dranḱshaṇa;* but by doubling the amount, saying 2 *dranḱshaṇas* instead of 1, he entirely spoils the comparison.

Since the unit of measure is not a natural unit, Page 77. but a conventional one assumed by general consent, it admits of both practical and imaginary division. Its subdivisions or fractions are different in different places at one and the same time, and at different periods in one and the same country. Their names, too, are different according to places and times; changes which are produced either by the organic development of languages or by accident.

A man from the neighbourhood of Somanâth told me that their *mithḳâl* is equal to ours; that

1 *mithḳâl* = 8 *ruvu*.
1 *ruvu* = 2 *pâli*.
1 *pâli* = 16 *yava*, *i.e.* barley-corn.

Accordingly 1 *mithḳâl* = 8 *ruvu* = 16 *pâli* = 256 *yava*.

This comparison shows that the man was mistaken

in comparing the two *mithkâls*; that what he called *mithkâls* is in reality the *tola*, and that he calls the *mâsha* by a different name, viz. *ruvu*.

Varâhamihira on weights.

If the Hindus wish to be particularly painstaking in these things, they give the following scale, based on the measurements which Varâhamihira prescribes for the construction of idols:—

1 *reṇu* or particle of dust	= 1 *raja*.
8 *raja*	= 1 *bâlâgra*, *i.e.* the end of a hair.
8 *bâlâgra*	= 1 *likhyâ*, *i.e.* the egg of a louse.
8 *likhyâ*	= 1 *yûkâ*, *i.e.* a louse.
8 *yûkâ*	= 1 *yava*, *i.e.* a barley-corn.

Hence, Varâhamihira goes on to enumerate the measures for distances. His measures of weight are the same as those which we have already mentioned. He says:

4 *yava*	= 1 *anḍî*.
4 *anḍî*	= 1 *mâsha*
16 *mâsha*	= 1 *suvarṇa*, *i.e.* gold.
4 *suvarṇa*	= 1 *pala*.

The measures of dry substances are the following:—

4 *pala*	= 1 *kuḍava*.
4 *kuḍava*	= 1 *prastha*.
4 *prastha*	= 1 *âḍhaka*.

The measures of liquid substances are the following:—

8 *pala*	= 1 *kuḍava*.
8 *kuḍava*	= 1 *prastha*.
4 *prastha*	= 1 *âḍhaka*.
4 *âḍhaka*	= 1 *droṇa*.

Weights according to the book *Caraka*.

The following weights occur in the book *Caraka*. I give them here according to the Arabic translation, as I have not received them from the Hindus *vivâ voce*. The Arabic copy seems to be corrupt, like all other books of this kind which I know. Such corruption must of necessity occur in our Arabic writing, more particularly at a period like ours, when people care

so little about the correctness of what they copy. "Âtreya says:

6 particles of dust	=	1 *marîci*.
6 *marîci*	=	1 mustard-seed (*râjikâ*).
8 mustard-seeds	=	1 red rice-corn.
2 red rice-corns	=	1 pea.
2 peas	=	1 *andî*.

And 1 *andî* is equal to $\frac{1}{8}$ *dânak*, according to the scale by which 7 *dânak* are equal to one *dirham*. Further:

4 *andî*	=	1 *mâsha*.
8 *mâsha*	=	1 *cana* (?).
2 *cana*	=	1 *karsha* or *suvarna* of the weight of 2 *dirhams*.
4 *suvarna*	=	1 *pala*.
4 *pala*	=	1 *kudava*.
4 *kudava*	=	1 *prastha*
4 *prastha*	=	1 *âdhaka*.
4 *âdhaka*	=	1 *drona*.
2 *drona*	=	1 *sûrpa*.
2 *sûrpa*	=	1 *jantî* (?)."

The weight *pala* is much used in all the business dealings of the Hindus, but it is different for different wares and in different provinces. According to some, 1 *pala* = $\frac{1}{15}$ *manâ*; according to others, 1 *pala* = 14 *mithkâl*; but the *manâ* is not equal to 210 *mithkâl*. According to others, 1 *pala* = 16 *mithkâl*, but the *manâ* is not equal to 240 *mithkâl*. According to others, 1 *pala* = 15 *dirham*, but the *manâ* is not equal to 225 *dirham*. In reality, however, the relation between the *pala* and the *manâ* is different.

Further, Âtreya says: "1 *âdhaka* = 64 *pala* = 128 *dirham* = 1 *ratl*. But if the *andî* is equal to $\frac{1}{8}$ *dânak*, one *suvarna* contains 64 *andî*, and then a *dirham* has 32 *andî*, which, as each *andî* is equal to $\frac{1}{8}$ *dânak*, are equal to 4 *dânak*. The double amount of it is $1\frac{1}{3}$ *dirham*" (*sic*). Page 78.

Such are the results when people, instead of translating, indulge in wild conjecture and mingle together different theories in an uncritical manner.

As regards the first theory, resting on the assumption of one *suvarṇa* being equal to three of our *dirhams*, people in general agree in this—that

1 *suvarṇa* = $\frac{1}{4}$ *pala*.
1 *pala* = 12 *dirham*.
1 *pala* = $\frac{1}{15}$ *manâ*.
1 *manâ* = 180 *dirham*.

This leads me to think that 1 *suvarṇa* is equal to 3 of our *mithḳâl*, not to 3 of our *dirham*.

Various authors on weights.

Varâhamihira says in another place of his Saṁhitâ: "Make a round vase of the diameter and height of one yard, and then expose it to the rain until it ceases. All the water that has been collected in it of the weight of 200 *dirham* is, if taken fourfold, equal to 1 *âḍhaka*."

This, however, is only an approximate statement, because, as we have above mentioned in his own words, 1 *âḍhaka* is equal to 768 either *dirham*, as *they* say, or *mithḳâl*, as *I* suppose.

Śrîpâla relates, on the authority of Varâhamihira, that 50 *pala* = 256 *dirham* = 1 *âḍhaka*. But he is mistaken, for here the number 256 does not mean *dirhams*, but the number of the *suvarṇa* contained in one *âḍhaka*. And the number of *pala* contained in 1 *âḍhaka* is 64, not 50.

As I have been told, Jîvaśarman gives the following detailed account of these weights:

4 *pala* = 1 *kuḍava*.
4 *kuḍava* = 1 *prastha*.
4 *prastha* = 1 *âḍhaka*.
4 *âḍhaka* = 1 *droṇa*.
20 *droṇa* = 1 *khâri*.

The reader must know that 16 *mâsha* are 1 *suvarṇa*, but in weighing wheat or barley they reckon 4 *suvarṇa* = 1 *pala*, and in weighing water and oil they reckon 8 *suvarṇa* = 1 *pala*.

The Hindu balance.

The balances with which the Hindus weigh things are χαριστίωνες, of which the weights are immovable, whilst the scales move on certain marks and lines.

Therefore the balance is called *tulâ*. The first lines mean the units of the weight from 1 to 5, and farther on to 10; the following lines mean the tenths, 10, 20, 30, &c. With regard to the cause of this arrangement they relate the following saying of Vâsudeva:—

"I will not kill Śiśupâla, the son of my aunt, if he has not committed a crime, but will pardon him *until ten*, and then I shall call him to account."

We shall relate this story on a later opportunity.

Alfazârî uses in his astronomical handbook the word *pala* for *day-minutes* (*i.e.* sixtieth parts of a day). I have not found this use anywhere in Hindu literature, but they use the word to denote *a correction* in a mathematical sense.

The Hindus have a weight called *bhâra*, which is mentioned in the books about the conquest of Sindh. It is equal to 2000 *pala*; for they explain it by 100 × 20 *pala*, and as nearly equal to the weight of an ox.

This is all I have lighted on as regards Hindu weights.

By measuring (with dry measures) people determine the body and the bulk of a thing, if it fills up a certain measure which has been gauged as containing a certain quantity of it, it being understood that the way in which the things are laid out in the measure, the way in which their surface is determined, and the way in which, on the whole, they are arranged within the measure, are in every case identical. If two objects which are to be weighed belong to the same species, they then prove to be equal, not only in bulk, but also in weight; but if they do not belong to the same species, their bodily extent is equal, but not their weight. Dry measures. Page 79.

They have a measure called *bîsî* (? *sîbî*), which is mentioned by every man from Kanauj and Somanâth. According to the people of Kanauj—

4 *bîsî* = 1 *prastha*.
¼ *bîsî* = 1 *kuḍava*.

According to the people of Somanâth—

16 *bîsî* = 1 *pantî*.
12 *pantî* = 1 *mora*.

According to another theory—

12 *bîsî* = 1 *kalasî*.
¼ *bîsî* = 1 *mâna*.

From the same source I learnt that a *mâna* of wheat is nearly equal to 5 *manâ*. Therefore 1 *bîsî* (?) is equal to 20 *manâ*. The *bîsî* corresponds to the Khwârizmian measure *sukhkh*, according to old style, whilst the *kalasî* corresponds to the Khwârizmian *ghûr*, for 1 *ghûr* = 12 *sukhkh*.

Measures of distances.

Mensuration is the determination of distances by lines and of superficies by planes. A plane ought to be measured by part of a plane, but the mensuration by means of lines effects the same purpose, as lines determine the limits of planes. When, in quoting Varâhamihira, we had come so far as to determine the weight of a barley-corn (p. 162), we made a digression into an exposition of weights, where we used his authority about gravity, and now we shall return to him and consult him about distances. He says—

8 barley-corns put together	= 1 *aṅgula*, *i.e.* finger.
4 fingers	= 1 *râma* (?), *i.e.* the fist.
24 fingers	= 1 *haṭṭha*, *i.e.* yard, also called *dasta*.
4 yards	= 1 *dhanu*, *i.e.* arc = a fathom.
40 arcs	= 1 *nalva*.
25 *nalva*	= 1 *krośa*.

Hence it follows that 1 *kroh* = 4000 yards; and as our mile has just so many yards, 1 mile = 1 *kroh*. Pulisa the Greek also mentions in his Siddhânta that 1 *kroh* = 4000 yards.

The *yard* is equal to 2 *mikyâs* or 24 fingers; for the Hindus determine the *śanku*, *i.e.* *mikyâs*, by idol-fingers. They do not call the twelfth part of a *mikyâs* a *finger* in general, as *we* do, but their *mikyâs* is always a *span*. The span, *i.e.* the distance between the ends of the

thumb and the small finger at their widest possible stretching, is called *vitasti* and also *kishku*.

The distance between the ends of the fourth or ring-finger and the thumb, both being stretched out, is called *gokarṇa*.

The distance between the ends of the index-finger and of the thumb is called *karabha*, and is reckoned as equal to two-thirds of a span.

The distance between the tops of the middle finger and of the thumb is called *tâla*. The Hindus maintain that the height of a man is eight times his *tâla*, whether he be tall or small; as people say with regard to the foot, that it is one-seventh of the height of a man.

Regarding the construction of idols, the book *Saṁhitâ* says:—

"The breadth of the palm has been determined as 6, the length as 7; the length of the middle finger as 5, that of the fourth finger as the same; that of the index-finger as the same *minus* $\frac{1}{6}$ (*i.e.* $4\frac{1}{6}$); that of the small finger as the same *minus* $\frac{1}{3}$ (*i.e.* $3\frac{1}{3}$); that of the thumb as equal to two-thirds of the length of the middle finger (*i.e.* $3\frac{1}{3}$), so that the two last fingers are of equal length."

By the measurements and numbers of this passage, the author means *idol-fingers*. Page 80.

The relation between *yojana*, mile, and *farsakh*.

After the measure of the *krośa* has been fixed and found to be equal to our *mile*, the reader must learn that they have a measure of distances, called *yojana*, which is equal to 8 miles or to 32,000 yards. Perhaps somebody might believe that 1 *kroh* is = $\frac{1}{4}$ *farsakh*, and maintain that the *farsakhs* of the Hindus are 16,000 yards long. But such is not the case. On the contrary, 1 *kroh* = $\frac{1}{2}$ *yojana*. In the terms of this measure, Alfazârî has determined the circumference of the earth in his astronomical handbook. He calls it *jûn*, in the plural *'ajwân*.

Relation between

The elements of the calculations of the Hindus on the circumference of the circle rest on the assumption

circumference and diameter.

that it is *thrice its diameter*. So the *Matsya-Purâṇa* says, after it has mentioned the diameters of the sun and moon in *yojanas*: "The circumference is thrice the diameter."

The *Âditya-Purâṇa* says, after it has mentioned the breadth of the *Dvîpas*, *i.e.* the islands and of their surrounding seas: "The circumference is thrice the diameter."

The same occurs also in the *Vâyu-Purâṇa*. In later times, however, Hindus have become aware of the fraction following after the three wholes. According to Brahmagupta, the circumference is $3\frac{1}{7}$ times the diameter; but he finds this number by a method peculiar to himself. He says: "As the root of 10 is nearly $3\frac{1}{7}$, the relation between the diameter and its circumference is like the relation between 1 and the root of 10." Then he multiplies the diameter by itself, the product by 10, and of this product he takes the root. Then the circumference is *solid*, *i.e.* consists of integers, in the same way as the root of ten. This calculation, however, makes the fraction larger than it really is. Archimedes defined it to be something between $\frac{10}{70}$ and $\frac{11}{70}$. Brahmagupta relates with regard to Âryabhaṭa, criticising him, that he fixed the circumference as 3393; that he fixed the diameter in one place as 1080, in another place as 1050. According to the first statement, the relation between diameter and circumference would be like $1 : 3\frac{17}{120}$. This fraction ($\frac{17}{120}$) is by $\frac{1}{17}$ smaller than $\frac{1}{7}$. However, as regards the second statement, it contains no doubt a blunder in the text, not of the author; for according to the text, the relation would be like $1 : 3\frac{1}{4}$ and something over.

Pulisa employs this relation in his calculations in the proportion of $1 : 3\frac{177}{1250}$.

This fraction is here by so much smaller than one-seventh as it is according to Âryabhaṭa, *i.e.* by $\frac{1}{177}$.

The same relation is derived from the old theory, which Ya'kûb Ibn Ṭârik mentions in his book, *Compositio Sphærarum*, on the authority of his Hindu informant, viz. that the circumference of the zodiac is 1,256,640,000 *yojana*, and that its diameter is 400,000,000 *yojana*.

These numbers presuppose the relation between circumference and diameter to be as $1 : 3\ \frac{56.640.000}{400.000.000}$. These two numbers may be reduced by the common divisor of 360,000. Thereby we get 177 as numerator and 1250 as denominator. And this is the fraction $(\frac{177}{1250})$ which Pulisa has adopted.

CHAPTER XVI.

NOTES ON THE WRITING OF THE HINDUS, ON THEIR ARITHMETIC AND RELATED SUBJECTS, AND ON CERTAIN STRANGE MANNERS AND CUSTOMS OF THEIRS.

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On various kinds of writing material.

THE tongue communicates the thought of the speaker to the hearer. Its action has therefore, as it were, a momentary life only, and it would have been impossible to deliver by oral tradition the accounts of the events of the past to later generations, more particularly if they are separated from them by long periods of time. This has become possible only by a new discovery of the human mind, by the art of writing, which spreads news over space as the winds spread, and over time as the spirits of the deceased spread. Praise therefore be unto Him who has arranged creation and created everything for the best!

The Hindus are not in the habit of writing on hides, like the Greeks in ancient times. Socrates, on being asked why he did not compose books, gave this reply: "I do not transfer knowledge from the living hearts of men to the *dead* hides of sheep." Muslims, too, used in the early times of Islam to write on hides, *e.g.* the treaty between the Prophet and the Jews of Khaibar and his letter to Kisrâ. The copies of the Koran were written on the hides of gazelles, as are still nowadays the copies of the Thora. There occurs this passage in the Koran (Sûra vi. 91): "They make it *karâṭîs*," *i.e.* τομάρια. The *kirṭâs* (or *charta*) is made in Egypt,

being cut out of the papyrus stalk. Written on this material, the orders of the Khalifs went out into all the world until shortly before our time. Papyrus has this advantage over vellum, that you can neither rub out nor change anything on it, because thereby it would be destroyed. It was in China that paper was first manufactured. Chinese prisoners introduced the fabrication of paper into Samarḳand, and thereupon it was made in various places, so as to meet the existing want.

The Hindus have in the south of their country a slender tree like the date and cocoa-nut palms, bearing edible fruits and leaves of the length of one yard, and as broad as three fingers one put beside the other. They call these leaves *târî* (*tâla* or *târ*=*Borassus flabelliformis*), and write on them. They bind a book of these leaves together by a cord on which they are arranged, the cord going through all the leaves by a hole in the middle of each.

In Central and Northern India people use the bark of the *tûz* tree, one kind of which is used as a cover for bows. It is called *bhûrja*. They take a piece one yard long and as broad as the outstretched fingers of the hand, or somewhat less, and prepare it in various ways. They oil and polish it so as to make it hard and smooth, and then they write on it. The proper order of the single leaves is marked by numbers. The whole book is wrapped up in a piece of cloth and fastened between two tablets of the same size. Such a book is called *pûthî* (cf. *pusta*, *pustaka*). Their letters, and whatever else they have to write, they write on the bark of the *tûz* tree.

On the Hindu alphabet.

As to the writing or alphabet of the Hindus, we have already mentioned that it once had been lost and forgotten; that nobody cared for it, and that in consequence people became illiterate, sunken into gross ignorance, and entirely estranged from science. But then Vyâsa, the son of Parâśara, rediscovered their

alphabet of fifty letters by an inspiration of God. A letter is called *akshara*.

Some people say that originally the number of their letters was less, and that it increased only by degrees. This is possible, or I should even say necessary. As for the Greek alphabet, a certain *Asidhas* (*sic*) had formed sixteen characters to perpetuate science about the time when the Israelites ruled over Egypt. Thereupon *Kîmush* (*sic*) and *Agenon* (*sic*) brought them to the Greeks. By adding four new signs they obtained an alphabet of twenty letters. Later on, about the time when Socrates was poisoned, Simonides added four
Page 32. other signs, and so the Athenians at last had a complete alphabet of twenty-four letters, which happened during the reign of Artaxerxes, the son of Darius, the son of Artaxerxes, the son of Cyrus, according to the chronographers of the West.

The great number of the letters of the Hindu alphabet is explained, firstly, by the fact that they express every letter by a separate sign if it is followed by a vowel or a diphthong or a *hamza* (*visarga*), or a small extension of the sound beyond the measure of the vowel; and, secondly, by the fact that they have consonants which are not found together in any other language, though they may be found scattered through different languages—sounds of such a nature that *our* tongues, not being familiar with them, can scarcely pronounce them, and that *our* ears are frequently not able to distinguish between many a cognate pair of them.

The Hindus write from the left to the right like the Greeks. They do not write on the basis of a line, above which the heads of the letters rise whilst their tails go down below, as in Arabic writing. On the contrary, their ground-line is above, a straight line above every single character, and from this line the letter hangs down and is written under it. Any sign *above* the line is nothing but a grammatical mark to

denote the pronunciation of the character above which it stands.

On the local alphabets of the Hindus.

The most generally known alphabet is called *Siddha-mâtṛikâ*, which is by some considered as originating from Kashmîr, for the people of Kashmîr use it. But it is also used in Varânasî. This town and Kashmîr are the high schools of Hindu sciences. The same writing is used in Madhyadeśa, *i.e.* the middle country, the country all around Kanauj, which is also called Âryâvarta.

In Mâlava there is another alphabet called *Nâgara*, which differs from the former only in the shape of the characters.

Next comes an alphabet called *Ardhanâgarî*, *i.e. half-nâgara*, so called because it is compounded of the former two. It is used in Bhâtiya and some parts of Sindh.

Other alphabets are the *Malwârî*, used in Malwashau, in Southern Sind, towards the sea-coast; the *Saindhava*, used in Bahmanwâ or Almansûra; the *Karnâṭa*, used in Karnâṭadeśa, whence those troops come which in the armies are known as *Kannara*; the *Andhrî*, used in Andhradeśa; the *Dirwarî* (*Drâviḍî*), used in Dirwaradeśa (Dravidadeśa); the *Lârî*, used in Lâradeśa (Lâṭadeśa); the *Gaurî* (*Gaudî*), used in Pûrvadeśa, *i.e.* the Eastern country; the *Bhaikshukî*, used in Udunpûr in Pûrvadeśa. This last is the writing of Buddha.

On the word Om.

The Hindus begin their books with *Om*, the word of creation, as we begin them with "In the name of God." The figure of the word *om* is ॐ. This figure does not consist of letters; it is simply an image invented to represent this word, which people use, believing that it will bring them a blessing, and meaning thereby a confession of the unity of God. Similar to this is the manner in which the Jews write the name of God, viz. by three Hebrew *yods*. In the Thora the word is written *YHVH* and pronounced

Adonai; sometimes they also say *Yah*. The word *Adonai*, which they pronounce, is not expressed in writing.

On their numeral signs.

The Hindus do not use the letters of their alphabet for numerical notation, as we use the Arabic letters in the order of the Hebrew alphabet. As in different parts of India the letters have different shapes, the numeral signs, too, which are called *aṅka*, differ. The numeral signs which *we* use are derived from the finest forms of the Hindu signs. Signs and figures are of no use if people do not know what they mean, but the people of Kashmîr mark the single leaves of their books with figures which look like drawings or like the Chinese characters, the meaning of which can only be learned by a very long practice. However, they do not use them when reckoning in the sand.

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In arithmetic all nations agree that all the *orders* of numbers (*e.g.* one, ten, hundred, thousand) stand in a certain relation to the ten; that each order is the tenth part of the following and the tenfold of the preceding. I have studied the names of the *orders* of the numbers in various languages with all kinds of people with whom I have been in contact, and have found that no nation goes beyond the thousand. The Arabs, too, stop with the thousand, which is certainly the most correct and the most natural thing to do. I have written a separate treatise on this subject.

Those, however, who go beyond the thousand in their numeral system are the Hindus, at least in their arithmetical technical terms, which have been either freely invented or derived according to certain etymologies, whilst in others both methods are blended together. They extend the names of the *orders* of numbers until the 18th *order* for religious reasons, the mathematicians being assisted by the grammarians with all kinds of etymologies.

The 18th *order* is called *Parârdha*, *i.e.* the half of

heaven, or, more acurately, *the half of that which is above*. For if the Hindus construct periods of time out of Kalpas, the unit of this *order* is *a day of God* (*i.e.* a half *nychthemeron*). And as we do not know any body larger than heaven, half of it (*parârdha*), as *a half of the greatest body*, has been compared with *a half of the greatest day*. By doubling it, by uniting night to day, we get the *whole* of the greatest day. There can be no doubt that the name *Parârdha* is accounted for in this way, and that *parâr* means *the whole of heaven*.

The following are the names of the eighteen *orders* of numbers:— The eighteen orders of numeration.

1. *Ekam.*
2. *Dasam.*
3. *Satam.*
4. *Sahasram.*
5. *Ayuta.*
6. *Laksha.*
7. *Prayuta.*
8. *Koti.*
9. *Nyarbuda.*
10. *Padma.*
11. *Kharva.*
12. *Nikharva.*
13. *Mahâpadma.*
14. *Sanku.*
15. *Samudra.*
16. *Madhya.*
17. *Antya.*
18. *Parârdha.*

I shall now mention some of their differences of opinion relating to this system.

Some Hindus maintain *that there is a 19th order beyond the Parârdha, called Bhûri, and that this is the limit of reckoning*. But in reality *reckoning* is unlimited; it has only a technical limit, which is conventionally adopted as the last of the *orders* of numbers. By the word *reckoning* in the sentence above they seem to mean *nomenclature*, as if they meant to say that the language has no *name* for any reckoning beyond the 19th *order*. It is known that the unit of this *order*, *i.e.* one *bhûri*, is equal to one-fifth of the *greatest day*, but on this subject they have no tradition. In their tradition there are only traces of combinations of the *greatest day*, as we shall hereafter explain. Therefore this 19th order is an addition of an artificial and hyper-accurate nature. Variations occurring in the eighteen orders.

Page 84. According to others, the limit of reckoning is *koṭi*; and starting from *koṭi* the succession of the *orders* of numbers would be *koṭi*, thousands, hundreds, tenths; for the number of Devas is expressed in *kôṭis*. According to their belief there are thirty-three *koṭis* of Devas, eleven of which belong to each of the three beings, Brahman, Narâyaṇa, and Mahâdeva.

The names of the *orders* beyond that of the 18th have been invented by the grammarians, as we have said already (p. 174).

Further, we observe that the popular name of the 5th *order* is *Daśa sahasra*, that of the 7th *order*, *Daśa laksha*; for the two names which we have mentioned in the list above (*Ayuta* and *Prayuta*) are rarely used.

The book of Âryabhaṭa of Kusumapura gives the following names of the *orders* from the ten till 10 *koṭi*:—

Ayutam.	*Koṭi padma.*
Niyutam.	*Parapadma.*
Prayutam.	

Further, it is noteworthy that some people establish a kind of etymological relationship between the different names; so they call the 6th *order Niyuta*, according to the analogy of the 5th, which is called *Ayuta*. Further, they call the 8th *order Arbuda*, according to the analogy of the 9th, which is called *Nyarbuda*.

There is a similar relation between *Nikharva* and *Kharva*, the names of the 12th and 11th *orders*, and between *Śaṅku* and *Mahâśaṅku*, the names of the 13th and 14th *orders*. According to this analogy *Mahâpadma* ought to follow immediately after *Padma*, but this latter is the name of the 10th, the former the name of the 13th *order*.

These are differences of theirs which can be traced back to certain reasons; but besides, there are many differences without any reason, which simply arise

from people dictating these names without observing any fixed order, or from the fact that they hate to avow their ignorance by a frank *I do not know*,—a word which is difficult to them in any connection whatsoever.

The *Pulisa-siddhânta* gives the following list of the *orders* of the numbers:—

4. *Sahasram.*	8. *Koṭi.*
5. *Ayutam.*	9. *Arbudam.*
6. *Niyutam.*	10. *Kharva.*
7. *Prayutam.*	

The following *orders*, from the 11th till the 18th, are the same as those of the above-mentioned list.

Numeral notation.

The Hindus use the numeral signs in arithmetic in the same way as we do. I have composed a treatise showing how far, possibly, the Hindus are ahead of us in this subject. We have already explained that the Hindus compose their books in Ślokas. If, now, they wish, in their astronomical handbooks, to express some numbers of the various *orders*, they express them by words used to denote certain numbers either in one *order* alone or at the same time in two *orders* (*e.g.* a word meaning either 20 or both 20 and 200). For each number they have appropriated quite a great quantity of words. Hence, if one word does not suit the metre, you may easily exchange it for a synonym which suits. Brahmagupta says: "If you want to write *one*, express it by everything which is unique, as *the earth, the moon; two* by everything which is double, as, *e.g. black* and *white; three* by everything which is threefold; the *nought* by *heaven*, the *twelve* by the names of the sun."

I have united in the following table all the expressions for the numbers which I used to hear from them; for the knowledge of these things is most essential for deciphering their astronomical handbooks

Whenever I shall come to know all the meanings of these words, I will add them, if God permits! Page 85.

0 = *śûnya* and *kha*, both meaning *point*.
gagana, *i.e.* heaven.
viyat, *i.e.* heaven.
âkâśa, *i.e.* heaven.
ambara, *i.e.* heaven.
abhra, *i.e.* heaven.

1 = *âdi*, *i.e.* the beginning.
śaśin.
indu.
śitâ.
urvarâ, *dharaṇî.*
pitâmaha, *i.e.* the first father.
candra, *i.e.* the moon.
śitâṁśu, *i.e.* the moon.
rûpa.
raśmi.

2 = *yama.*
aśvin.
ravicandra.
locana, *i.e.* the two eyes.
akshi.
dasra.
yamala.
paksha, *i.e.* the two halves of a month.
netra, *i.e.* the two eyes.

3 = *trikâla*, *i.e.* the three parts of time.
trijagat.
trayam.
pâvaka, *vaiśvânara*, *dahana*, *tapana*, *hutâśana*, *jvalana*, *agni*, *i.e.* fire.
[*triguṇa*,] *i.e.* the three first forces.
loka, *i.e.* the worlds, earth, heaven, and hell.
trikaṭu.

4 = *veda*, *i.e.* their sacred code, because it has four parts.
samudra, *sâgara*, *i.e.* the sea.
abdhi.
dadhi.
diś, *i.e.* the four cardinal points.
jalâśaya.
kṛita. Page 86.

5 = *śara.*
artha.
indriya, *i.e.* the five senses.
sâyaka.
اخون
vâṇa.
bhâta.
ishu.
Pâṇḍava, *i.e.* the five royal brothers.
pattrin, *mârgaṇa.*

6 = *rasa.*
aṅga.
shaṭ.
الرم (?) *i.e.* the year.
ṛitu (?).
mâsârdham.

7 = *aga.*
mahîdhara.
parvata, *i.e.* the mountains.
saptan.
naga, *i.e.* the mountains.
adri.
muni.

8 = *vasu*, *ashṭa.*
dhî, *maṅgala.*
gaja, *nâga.*
dantin.

9 = *go*, *chidra.*
nanda, *pavana.*
randhra, *antara.*
navan = 9. Page 87.

10 = *diś, khendu.*
âśâ, Râvaṇa-śiras.

11 = *Rudra,* the destroyer of the world.
Mahâdeva, i.e. the prince of the angels.
îśvara.
akshauhiṇî, i.e. the army Kuru had.

12 = *sûrya,* because there are twelve suns.
âditya.
arka, i.e. the sun.
mâsa, bhânu.
sahasrâṃśu.

13 = *viśva.*

14 = *manu,* the lords of the fourteen *manvantaras.*
15 = *tithi, i.e.* the lunar days in each half month.
16 = *ashṭi, nripa, bhûpa.*
17 = *atyashṭi.*
18 = *dhriti.* Page 88.
19 = *atidhriti.*
20 = *nakha, kṛiti.*
21 = *utkriti.*
22 =
23 =
24 =
25 = *tattva, i.e.* the twenty-five things, through the knowledge of which liberation is obtained.

As far as I have seen and heard of the Hindus, they do not usually go beyond twenty-five with this kind of numerical notation.

Strange manners and customs of the Hindus. Page 89.

We shall now speak of certain strange manners and customs of the Hindus. The strangeness of a thing evidently rests on the fact that it occurs but rarely, and that we seldom have the opportunity of witnessing it. If such strangeness reaches a high degree, the thing becomes a curiosity, or even something like a miracle, which is no longer in accordance with the ordinary laws of nature, and which seems chimerical as long as it has not been witnessed. Many Hindu customs differ from those of our country and of our time to such a degree as to appear to us simply monstrous. One might almost think that they had intentionally changed them into the opposite, for *our* customs do not resemble theirs, but are the very reverse; and if ever a custom of *theirs* resembles one of *ours*, it has certainly just the opposite meaning.

They do not cut any of the hair of the body. Originally they went naked in consequence of the heat, and by not cutting the hair of the head they intended to prevent sunstroke.

They divide the moustache into single plaits in order to preserve it. As regards their not cutting the hair of the genitals, they try to make people believe that the cutting of it incites to lust and increases carnal desire. Therefore such of them as feel a strong desire for cohabitation never cut the hair of the genitals.

They let the nails grow long, glorying in their idleness, since they do not use them for any business or work, but only, while living a *dolce far niente* life, they scratch their heads with them and examine the hair for lice.

The Hindus eat singly, one by one, on a tablecloth of dung. They do not make use of the remainder of a meal, and the plates from which they have eaten are thrown away if they are earthen.

They have red teeth in consequence of chewing areca-nuts with betel-leaves and chalk.

They drink wine before having eaten anything, then they take their meal. They sip the stall of cows, but they do not eat their meat.

They beat the cymbals with a stick.

They use turbans for trousers. Those who want little dress are content to dress in a rag of two fingers' breadth, which they bind over their loins with two cords; but those who like much dress, wear trousers lined with so much cotton as would suffice to make a number of counterpanes and saddle-rugs. These trousers have no (visible) openings, and they are so huge that the feet are not visible. The string by which the trousers are fastened is at the back.

Their *ṣidâr* (a piece of dress covering the head and the upper part of breast and neck) is similar to the trousers, being also fastened at the back by buttons.

The lappets of the *kurṭakas* (short shirts from the shoulders to the middle of the body with sleeves, a

female dress) have slashes both on the right and left sides.

They keep the shoes tight till they begin to put them on. They are turned down from the calf before walking (?).

In washing they begin with the feet, and then wash the face. They wash themselves before cohabiting with their wives.

Cœunt stantes velut palus vitis, dum mulieres ab imo sursum moventur velut occupatæ in arando, maritus vero plane otiosus manet.

On festive days they besmear their bodies with dung instead of perfumes.

The men wear articles of female dress; they use cosmetics, wear earrings, arm-rings, golden seal-rings on the ring-finger as well as on the toes of the feet.

Miseret eos cat[illegible]*miti et viri qui rebus venereis frui non potest* pushaṇḍila *dicti, qui penem bucca devorans semen elicit sorbendum.*

In cacando faciem vertunt versus murum retegentes pudenda ut videantur a prætereuntibus.

Sacra faciunt virilibus liṅga *dictis, quæ est imago veretri Mahadevæ.*

They ride without a saddle, but if they put on a saddle, they mount the horse from its right side. In travelling they like to have somebody riding behind them.

They fasten the *kuṭhâra*, *i.e.* the dagger, at the waist on the right side.

They wear a girdle called *yajnopavîta*, passing from the left shoulder to the right side of the waist.

In all consultations and emergencies they take the advice of the women. Page 90.

When a child is born people show particular attention to the man, not to the woman.

Of two children they give the preference to the younger, particularly in the eastern parts of the country; for they

maintain that the elder owes his birth to predominant lust, whilst the younger owes his origin to mature reflection and a calm proceeding.

In shaking hands they grasp the hand of a man from the convex side.

They do not ask permission to enter a house, but when they leave it they ask permission to do so.

In their meetings they sit cross-legged.

They spit out and blow their noses without any respect for the elder ones present, and they crack their lice before them. They consider the *crepitus ventris* as a good omen, sneezing as a bad omen.

They consider as unclean the weaver, but as clean the cupper and the flayer, who kills dying animals for money either by drowning or by burning.

They use black tablets for the children in the schools, and write upon them along the long side, not the broad side, writing with a white material from the left to the right. One would think that the author of the following verses had meant the Hindus:—

> "How many a writer uses paper as black as charcoal,
> Whilst his pen writes on it with white colour.
> By writing he places a bright day in a dark night,
> Weaving like a weaver, but without adding a woof."

They write the title of a book at the end of it, not at the beginning.

They magnify the nouns of their language by giving them the feminine gender, as the Arabs magnify them by the diminutive form.

If one of them hands over a thing to another, he expects that it should be thrown to him as we throw a thing to the dogs.

If two men play at *Nard* (backgammon), a third one throws the dice between them.

They like the juice which flows over the cheeks of

the rutting elephant, which in reality has the most horrid smell.

In playing chess they move the elephant straight on, not to the other sides, one square at a time, like the pawn, and to the four corners also one square at a time, like the queen (*firzân*). They say that these five squares (*i.e.* the one straight forward and the others at the corners) are the places occupied by the trunk and the four feet of the elephant. On the Indian chess.

They play chess—four persons at a time—with a pair of dice. Their arrangement of the figures on the chess-board is the following:—

Tower (*rukh*).	Horse.	Elephant	King.			Pawn.	Tower.
Pawn.	Pawn.	Pawn.	Pawn.			Pawn.	Horse.
						Pawn.	Elephant.
						Pawn.	King.
King.	Pawn.						
Elephant.	Pawn.						
Horse.	Pawn.			Pawn.	Pawn.	Pawn.	Pawn.
Tower.	Pawn.			King.	Elephant.	Horse.	Tower.

As this kind of chess is not known among us, I shall here explain what I know of it.

The four persons playing together sit so as to form a square round a chess-board, and throw the two dice alternately. Of the numbers of the dice the five and
Page 91. six are blank (*i.e.* do not count as such). In that case, if the dice show five or six, the player takes one instead of the five, and four instead of the six, because the figures of these two numerals are drawn in the following manner:—

6 5
4 3 2 1

so as to exhibit a certain likeness of form to 4 and 1, viz. in the Indian signs.

The name *Shâh* or *king* applies here to the *queen* (*firzân*).

Each number of the dice causes a move of one of the figures.

The 1 moves either the pawn or the king. Their moves are the same as in the common chess. The king may be taken, but is not required to leave his place.

The 2 moves the tower (*rukh*). It moves to the third square in the direction of the diagonal, as the elephant moves in *our* chess.

The 3 moves the horse. Its move is the generally known one to the third square in oblique direction.

The 4 moves the elephant. It moves in a straight line, as the tower does in our chess, unless it be prevented from moving on. If this is the case, as sometimes happens, one of the dice removes the obstacle, and enables it to move on. Its smallest move is one square, the greatest fifteen squares, because the dice sometimes show two 4, or two 6, or a 4 and a 6. In consequence of one of these numbers, the elephant moves along the whole side on the margin of the chess-board; in consequence of the other number, it moves

along the other side on the other margin of the board, in case there is no impediment in its way. In consequence of these two numbers, the elephant, in the course of his moves, occupies the two ends of the diagonal.

The pieces have certain values, according to which the player gets his share of the stake, for the pieces are taken and pass into the hands of the player. The value of the king is 5, that of the elephant 4, of the horse 3, of the tower 2, and of the pawn 1. He who takes a king gets 5. For two kings he gets 10, for three kings 15, if the winner is no longer in possession of his own king. But if he has still his own king, and takes all three kings, he gets 54, a number which represents a progression based on general consent, not on an algebraic principle.

The innate perversity of the Hindu character.

If the Hindus claim to differ from us, and to be something better than we, as we on our side, of course, do *vice versâ*, we might settle the question by an experiment to be made with their boys. I never knew a Hindu boy who had only recently come into Muhammadan territory who was not thoroughly versed in the manners and customs of the people, but at the same time he would place the shoes before his master in a wrong order, the right one to the left foot, and *vice versâ;* he would, in folding, turn his master's garments inside out, and spread the carpets so that the under part is uppermost, and more of the kind. All of which is a consequence of the innate perversity of the Hindu nature.

Customs of the heathen Arabs.

However, I must not reproach the Hindus only with their heathen practices, for the heathen Arabs too committed crimes and obscenities. They cohabited with menstruating and pregnant women; several men agreed to cohabit with the same woman in the same period of menstruation; they adopted the children of others, of their guests, of the lover of their daughter, not to men-

tion that in some kinds of their worship they whistled on their fingers and clapped with their hands, and that they ate unclean and dead animals. Islam has abolished all those things among the Arabs, as it has also abolished them in those parts of India the people of which have become Muḥammadans. Thanks be unto God!

CHAPTER XVII.

ON HINDU SCIENCES WHICH PREY ON THE IGNORANCE OF PEOPLE.

On alchemy among the Hindus in general.

We understand by witchcraft, making by some kind of delusion a thing appear to the senses as something different from what it is in reality. Taken in this sense, it is far spread among people. Understood, however, Page 92. as common people understand it, as the producing of something which is impossible, it is a thing which does not lie within the limits of reality. For as that which is impossible cannot be produced, the whole affair is nothing but a gross deception. Therefore witchcraft in this sense has nothing whatever to do with science.

One of the species of witchcraft is alchemy, though it is generally not called by this name. But if a man takes a bit of cotton and makes it appear as a bit of gold, what would you call this but a piece of witchcraft? It is quite the same as if he were to take a bit of silver and make it appear as gold, only with this difference, that the latter is a generally-known process, *i.e.* the gilding of silver, the former is not.

The Hindus do not pay particular attention to alchemy, but no nation is entirely free from it, and one nation has more bias for it than another, which must not be construed as proving intelligence or ignorance; for we find that many intelligent people are entirely given to alchemy, whilst ignorant people ridicule the art and its adepts. Those intelligent people, though

boisterously exulting over their make-believe science, are not to be blamed for occupying themselves with alchemy, for their motive is simply excessive eagerness for acquiring fortune and for avoiding misfortune. Once a sage was asked why scholars always flock to the doors of the rich, whilst the rich are not inclined to call at the doors of scholars. "The scholars," he answered, "are well aware of the use of money, but the rich are ignorant of the nobility of science." On the other hand, ignorant people are not to be praised, although they behave quite quietly, simply because they abstain from alchemy, for their motives are objectionable ones, rather practical results of innate ignorance and stupidity than anything else.

The adepts in this art try to keep it concealed, and shrink back from intercourse with those who do not belong to them. Therefore I have not been able to learn from the Hindus which methods they follow in this science, and what element they principally use, whether a mineral or an animal or a vegetable one. I only heard them speaking of the process of *sublimation*, of *calcination*, of *analysis*, and of the *waxing of talc*, which they call in their language *tâlaka*, and so I guess that they incline towards the mineralogical method of alchemy.

The science of Rasâyana.

They have a science similar to alchemy which is quite peculiar to them. They call it *Rasâyana*, a word composed with *rasa*, *i.e.* gold. It means an art which is restricted to certain operations, drugs, and compound medicines, most of which are taken from plants. Its principles restore the health of those who were ill beyond hope, and give back youth to fading old age, so that people become again what they were in the age near puberty; white hair becomes black again, the keenness of the senses is restored as well as the capacity for juvenile agility, and even for cohabitation, and the life of people in this world is even extended to a

long period. And why not? Have we not already mentioned on the authority of Patañjali (v. p. 88) that one of the methods leading to liberation is *Rasâyana*? What man would hear this, being inclined to take it for truth, and not dart off into foolish joy and not honour the master of such a wonderful art by popping the choicest bit of his meal into his mouth?

Nâgârjuna, the author of a book on Rasâyana.

A famous representative of this art was Nâgârjuna, a native of the fort Daihak, near Somanâth. He excelled in it, and composed a book which contains the substance of the whole literature on this subject, and is very rare. He lived nearly a hundred years before our time.

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The alchemist Vyâḍi in the time of King Vikramâditya.

In the time of the King Vikramâditya, of whose era we shall speak hereafter, there lived in the city of Ûjain a man of the name of Vyâḍi, who had turned his whole attention to this science, and had ruined on account of it both his life and property, but all his zeal did not even avail him so much as to help him to things which, under ordinary circumstances, are easily obtained. Becoming restricted in his means, he conceived a disgust to that which had been the object of all his exertions, and sat down on the bank of a river sighing, sorrowful, and despairing. He held in his hand his *pharmacopœia*, from which he used to take the prescriptions for his medicines, but now he began to throw one leaf of it after the other into the water. A harlot happened to sit on the bank of the same river farther down, who, on seeing the leaves pass by, gathered them, and fished up some relating to *Rasâyana*. Vyâḍi did not notice her till all the leaves of his book had gone. Then the woman came to him, asking why he had done so with his book, whereupon he answered, "Because I have derived no advantage from it. I have *not* obtained what I ought to have obtained; for *its* sake I have become bankrupt after having had great treasures, and now I am miserable

after having so long been in the hope of obtaining happiness." The harlot spoke: "Do not give up a pursuit in which you have spent your life; do not despair of the possibility of a thing which all sages before you have shown to be true. Perhaps the obstacle which prevents you from realising your plans is only of an accidental nature, which may perhaps be removed by an accident. I have much solid cash. It is all yours that you may spend it on the realisation of your plans." Thereupon Vyâḍi resumed his work.

However, books of this kind are written in an enigmatic style. So he happened to misunderstand a word in the prescription of a medicine, which meant *oil* and *human blood*, both being required for it. It was written *raktâmala*, and he thought it meant *red myrobalanon*. When he used the medicine it had no effect whatsoever. Now he began to concoct the various drugs, but the flame touched his head and dried up his brain. Therefore he oiled himself with oil, pouring it in great quantity over his skull. One day he rose to step away from the fireplace for some business or other, but as there happened to be a peg projecting from the roof right above his head, he knocked his head against it, and the blood began to flow. On account of the pain which he felt, he looked downward, and in consequence some drops of blood mixed with oil dropped from the upper part of his skull into the caldron without his noticing it. When, then, the concocting process was finished and he and his wife besmeared themselves with the concoction in order to try it, they both flew up into the air. Vikramâditya on hearing of this affair left his castle, and proceeded to the market-place in order to see them with his own eyes. Then the man shouted to him, "Open thy mouth for my saliva." The king, however, being disgusted, did not do it, and so the saliva fell down near the door, and immediately the threshold was filled with gold.

Vyâḍi and the woman flew to any place they liked. He has composed famous books on this science. People say that both man and wife are still alive.

Story about the piece of silver in the door of the Government-house in Dhâra.

A similar tale is the following:—In the city of Dhâra, the capital of Mâlava, which is in our days ruled by Bhojadeva, there lies in the door of the Government-house an oblong piece of pure silver, in which the outlines of the limbs of a man are visible. Its origin is accounted for by the following story:—Once in olden times a man went to a king of theirs, bringing him a *Rasâyana*, the use of which would make him immortal, victorious, invincible, and capable of doing everything he desired. He asked the king to come alone to the Page 94. place of their meeting, and the king gave orders to keep in readiness all the man required.

The man began to boil the oil for several days, until at last it acquired consistency. Then he spoke to the king: "Spring into it and I shall finish the process." But the king, terrified at what he saw, had not the courage to dive into it. The man, on perceiving his cowardice, spoke to him: "If you have not sufficient courage, and will not do it for yourself, will you allow me myself to do it?" Whereupon the king answered, "Do as you like." Now he produced several packets of drugs, and instructed him that when such and such symptoms should appear, he should throw upon him this or that packet. Then the man stepped forward to the caldron and threw himself into it, and at once he was dissolved and reduced into pulp. Now the king proceeded according to his instruction, but when he had nearly finished the process, and there remained only one packet that was not yet thrown into the mass, he began to be anxious, and to think what might happen to his realm, in case the man should return to life as an *immortal, victorious, invincible* person, as has above been mentioned. And so he thought it preferable not to throw the last packet into the mass. The consequence

was that the caldron became cold, and the dissolved man became consolidated in the shape of the said piece of silver.

The Hindus tell a tale about Vallabha, the king of the city of Vallabhî, whose era we have mentioned in the proper chapter.

Story of the fruit-seller Rañka and the king Vallabha.

A man of the rank of a *Siddha* asked a herdsman with reference to a plant called *Thohar*, of the species of the *Lactaria*, from which milk flows when they are torn off, whether he had ever seen *Lactaria* from which blood flows instead of milk. When the herdsman declared he had, he gave him some drink-money that he should show it to him, which he did. When the man now saw the plant, he set fire to it, and threw the dog of the herdsman into the flame. Enraged thereby, the herdsman caught the man, and did with him the same as he had done to his dog. Then he waited till the fire was extinguished, and found both the man and the dog, but turned into gold. He took the dog with him, but left the man on the spot.

Now some peasant happened to find it. He cut off a finger, and went to a fruit-seller who was called *Rañka*, i.e. *the poor*, because he was an utter pauper, and evidently near bankruptcy. After the peasant had bought from him what he wanted, he returned to the golden man, and then he found that in the place where the cut off finger had been, a new finger had grown. He cut it off a second time, and bought again from the same fruit-seller all that he wanted. But when the fruit-seller asked him whence he had the finger, he was stupid enough to tell him. So Rañka went out to the body of the Siddha, and brought it on a carriage to his house. He stayed in his old abode, but managed by degrees to buy the whole town. The king Vallabha desired to own the same town, and asked him to cede it to him for money, but Rañka declined. Being however afraid of the king's resentment, he fled to the lord

of Almanṣûra, made him presents of money, and asked him to help him by a naval force. The lord of Almanṣûra complied with his desire, and assisted him. So he made a night-attack upon the king Vallabha, and killed him and his people, and destroyed his town. People say that still in our time there are such traces left in that country as are found in places which were destroyed by an unexpected night-attack.

The greediness of the ignorant Hindu princes for gold-making does not know any limit. If any one of them wanted to carry out a scheme of gold-making, and people advised him to kill a number of fine little children, the monster would not refrain from such a crime; he would throw them into the fire. If this precious science of Rasâyana were banished to the utmost limits of the world, where it is unattainable to anybody, it would be the best.

An Eranian tradition. Page 95.

According to the Eranian tradition, Isfandiyâd is said to have spoken when dying: "Kâûs had been given the power and the miraculous things mentioned in the Book of the Law. Finally he went to the mountain Kâf as a decrepit man, bent down by old age, but he returned thence as a lively youth of well-proportioned figure and full of force, having made the clouds his carriage, as God allowed him."

On the bird Garuḍa.

As regards charms and incantations, the Hindus have a firm belief in them, and they, as a rule, are much inclined towards them. The book which treats of those things is considered as a work of Garuḍa, a bird on which Nârâyaṇa rode. Some people describe this bird in such a way as to indicate a Ṣifrid-bird and its doings. It is an enemy of fish, catching them. As a rule, animals have by nature an aversion to their opponents, and try to beware of them; here, however, there is an exception to this rule. For when this bird flutters above the water and swims on it, the fish rise from the

deep to the surface, and make it easy to him to catch them, as if he had bound them by his spell. Others describe it with such characteristics as might indicate a stork. The *Vâyu Purâṇa* attributes to it a pale colour. On the whole, Garuḍa comes nearer to a stork than to a Śifrid, as the stork is by nature, like Garuḍa, a destroyer of snakes.

The effect of charms on the bite of serpents.

Most of their charms are intended for those who have been bitten by serpents. Their excessive confidence in them is shown by this, which I heard a man say, that he had seen a dead man who had died from the bite of a serpent, but after the charm had been applied he had been restored to life, and remained alive, moving about like all others.

Another man I heard as he told the following story: "He had seen a man who had died from the bite of a serpent. A charm was applied, and in consequence he rose, spoke, made his will, showed where he had deposited his treasures, and gave all necessary information about them. But when he inhaled the smell of a dish, he fell down dead, life being completely extinct."

It is a Hindu custom that when a man has been bitten by a venomous serpent, and they have no charmer at hand, they bind the bitten man on a bundle of reeds, and place on him a leaf on which is written a blessing for that person who will accidentally light upon him, and save him by a charm from destruction.

I, for my part, do not know what I am to say about these things, since I do not believe in them. Once a man who had very little belief in reality, and much less in the tricks of jugglers, told me that he had been poisoned, and that people had sent him some Hindus possessing the knowledge of charms. They sang their charms before him, and this had a quieting effect upon him, and soon he felt that he became better and better, whilst they were drawing lines in the air with their hands and with twigs.

I myself have witnessed that in hunting gazelles they caught them with the hand. One Hindu even went so far as to assert that he, without catching the gazelle, would drive it before him and lead it straight into the kitchen. This, however, rests, as I believe I have found out, simply on the device of slowly and constantly accustoming the animals to one and the same melody. Our people, too, practise the same when hunting the ibex, which is more wild even than the gazelle. When they see the animals resting, they begin to walk round them in a circle, singing one and the same melody so long until the animals are accustomed to it. Then they make the circle more and more narrow, till at last they come near enough to shoot at the animals which lie there in perfect rest. Hunting practices.

The shooters of Kaṭâ-birds have a custom of beating copper-vessels during the night with one and the same kind of beat, and they manage to catch them with the hand. If, however, the beat is changed, the birds fly off in all directions.

All these things are peculiar customs which have nothing whatsoever to do with charms. Sometimes the Hindus are considered as sorcerers because of their playing with balls on raised beams or on tight ropes, but tricks of this kind are common to all nations. Page 96.

CHAPTER XVIII.

VARIOUS NOTES ON THEIR COUNTRY, THEIR RIVERS, AND THEIR OCEAN. ITINERARIES OF THE DISTANCES BETWEEN THEIR SEVERAL KINGDOMS, AND BETWEEN THE BOUNDARIES OF THEIR COUNTRY.

The inhabitable world and the ocean.

THE reader is to imagine the inhabitable world, ἡ οἰκουμένη, as lying in the northern half of the earth, and more accurately in one-half of this half—*i.e.* in one of the quarters of the earth. It is surrounded by a sea, which both in west and east is called *the comprehending one*; the Greeks call its western part near their country ὠκεανός. This sea separates the inhabitable world from whatever continents or inhabitable islands there may be beyond it, both towards west and east; for it is not navigable on account of the darkness of the air and the thickness of the water, because there is no more any road to be traced, and because the risk is enormous, whilst the profit is nothing. Therefore people of olden times have fixed marks both on the sea and its shores which are intended to deter from entering it.

The inhabitable world does not reach the north on account of the cold, except in certain places where it penetrates into the north in the shape, as it were, of tongues and bays. In the south it reaches as far as the coast of the ocean, which in west and east is connected with the *comprehending ocean*. This southern ocean is navigable. It does not form the utmost southern limit of the inhabitable world. On the con-

trary, the latter stretches still more southward in the shape of large and small islands which fill the ocean. In this southern region land and water dispute with each other their position, so that in one place the continent protrudes into the sea, whilst in another the sea penetrates deeply into the continent.

The continent protrudes far into the sea in the western half of the earth, and extends its shores far into the south. On the plains of this continent live the western negroes, whence the slaves are brought; and there are the Mountains of the Moon, and on them are the sources of the Nile. On its coast, and the islands before the coast, live the various tribes of the Zanj. There are several bays or gulfs which penetrate into the continent on this western half of the earth—the bay of Berberâ, that of Klysma (the Red Sea), and that of Persia (the Persian Gulf); and between these gulfs the western continent protrudes more or less into the ocean.

In the eastern half of the earth the sea penetrates as deeply into the northern continent as the continent in the western half protrudes into the southern sea, and in many places it has formed bays and estuaries which run far into the continent—bays being parts of the sea, estuaries being the outlets of rivers towards the sea. This sea is mostly called from some island in it or from the coast which borders it. Here, however, we are concerned only with that part of the sea which is bordered by the continent of India, and therefore is called the *Indian Ocean*.

The orographic system of Asia and Europe.

As to the orographic configuration of the inhabitable world, imagine a range of towering mountains like the vertebræ of a pine stretching through the middle latitude of the earth, and in longitude from east to west, passing through China, Tibet, the country of the Turks, Kâbul, Badhakhshân, Ṭokhâristân, Bâmiyân, Elghôr, Khurâsân, Media, Âdharbaijân, Armenia, the Roman

Empire, the country of the Franks, and of the Jalâliḳa (Gallicians). Long as this range is, it has also a considerable breadth, and, besides, many windings which enclose inhabited plains watered by streams which descend from the mountains both towards north and south. One of these plains is India, limited in the south by the above-mentioned Indian Ocean, and on all three other sides by the lofty mountains, the waters of which flow down to it. But if you have seen the soil of India with your own eyes and meditate on its nature—if you consider the rounded stones found in the earth however deeply you dig, stones that are huge near the mountains and where the rivers have a violent current; stones that are of smaller size at greater distance from the mountains, and where the streams flow more slowly; stones that appear pulverised in the shape of sand where the streams begin to stagnate near their mouths and near the sea—if you consider all this, you could scarcely help thinking that India has once been a sea which by degrees has been filled up by the alluvium of the streams.

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India, a recent alluvial formation.

First orientation regarding Madhyadeśa, Kanoj, Mâhûra, and Tânêshar.

The middle of India is the country round Kanoj (Kanauj), which they call *Madhyadeśa, i.e.* the middle of the realms. It is the middle or centre from a geographical point of view, in so far as it lies half way between the sea and the mountains, in the midst between the hot and the cold provinces, and also between the eastern and western frontiers of India. But it is a political centre too, because in former times it was the residence of their most famous heroes and kings.

The country of Sindh lies to the west of Kanoj. In marching from our country to Sindh we start from the country of Nîmrôz, *i.e.* the country of Sijistân, whilst marching to *Hind* or India proper we start from the side of Kâbul. This, however, is not the only possible road. You may march into India from all sides, supposing that you can remove the obstacles in the way.

In the mountains which form the frontier of India towards the west there are tribes of the Hindus, or of people near akin to them—rebellious savage races—which extend as far as the farthermost frontiers of the Hindu race.

Kanoj lies to the west of the Ganges, a very large town, but most of it is now in ruins and desolate since the capital has been transferred thence to the city of Bârî, east of the Ganges. Between the two towns there is a distance of three to four days' marches.

As Kanoj (*Kanyâkubja*) has become famous by the children of Pâṇḍu, the city of Mâhûra (*Mathurâ*) has become famous by Vâsudeva. It lies east of the river Jaun (*Yamunâ*). The distance between Mâhûra and Kanoj is 28 *farsakh*.

Tânêshar (*Sthânêśvara*) lies between the two rivers to the north both of Kanoj and Mâhûra, at a distance of nearly 80 *farsakh* from Kanoj, and nearly 50 *farsakh* from Mâhûra.

The river Ganges rises in the mountains which have already been mentioned. Its source is called *Gangâ-dvâra*. Most of the other rivers of the country also rise in the same mountains, as we have already mentioned in the proper place.

Hindu method of determining distances.

As for the distances between the various parts of India, those who have not themselves actually seen them must rely upon tradition; but unfortunately it is of such a nature that already Ptolemy incessantly complains of its transmitters and their bias towards story-telling. Fortunately I have found out a certain rule by which to control their lies. The Hindus frequently estimate the burden an ox could bear at 2000 and 3000 *manâ* (which is infinitely more than an ox could carry *at once*). In consequence they are compelled to let the caravan make the same march to and fro during many days—in fact, so long until the ox has carried the whole load assigned to it from one end of the route to

the other, and then they reckon as the distance between the two places *a march of such a number of days* as the caravan has altogether spent in marching to and fro. It is only with the greatest exertion and caution that we can to some extent correct the statements of the Hindus. However, we could not make up our mind to suppress that which we know on account of that which we do not know. We ask the reader's pardon where there is anything wrong, and now we continue.

From Kanoj to the Tree of Prayâga (Allahabad) and to the eastern coast. Page 98.

A man marching from Kanoj to the south between the two rivers Jaun and Ganges passes the following well-known places:—*Jajjamau*, 12 *farsakh* from Kanoj, each *farsakh* being equal to four miles or one *kurôh*; *Abhâpûrî*, 8 *farsakh*; *Kuraha*, 8 *farsakh*; *Barhamshîl*, 8 *farsakh*; the *Tree of Prayâga*, 12 *farsakh*, the place where the water of the Jaun joins the Ganges, where the Hindus torment themselves with various kinds of tortures, which are described in the books about religious sects. The distance from Prayâga to the place where the Ganges flows into the sea is 12 *farsakh* (*sic*).

Other tracts of country extend from the Tree of Prayâga southward towards the coast. *Arku-tîrtha*, 12 *farsakh* from Prayâga; the realm *Uwaryahâr*, 40 *farsakh*; *Ûrdabîshau* on the coast, 50 *farsakh*.

Thence along the coast towards the east there are countries which are now under the sway of *Jaur*; first *Daraur*, 40 *farsakh* from *Ûrdabîshau*; *Kânjî*, 30 *farsakh*; *Malaya*, 40 *farsakh*; *Kânk*, 30 *farsakh*, which is the last of Jaur's possessions in this direction.

From Bârî to the mouth of the Ganges.

Marching from Bârî along the Ganges on its eastern side, you pass the following stations:—*Ajodaha* (Ayodhyâ, Oudh), 25 *farsakh* from Bârî; the famous *Banârasî*, 20 *farsakh*.

Thence changing the direction, and marching eastward instead of southward, you come to *Sharwâr*, 35 *farsakh* from Banârasî; *Pâṭaliputra*, 20 *farsakh*; *Mungîrî*, 15 *farsakh*; *Janpa*, 30 *farsakh*; *Dâgumpûr*,

50 *farsakh*; *Gangâsâyara*, 30 *farsakh*, where the Ganges flows into the sea.

Kanoj through Nepal to Bhoteshar.

Marching from Kanoj towards the east, you come to *Bârî*, 10 *farsakh*; *Dûgum*, 45 *farsakh*; the empire of *Shilahat*, 10 *farsakh*; the town *Bihat*, 12 *farsakh*. Farther on the country to the right is called *Tilwat*, the inhabitants *Tarû*, people of very black colour and flat-nosed like the Turks. Thence you come to the mountains of Kâmrû, which stretch away as far as the sea.

Opposite Tilwat the country to the left is the realm of Naipâl. A man who had travelled in those countries gave me the following report:—"When in Tanwat, he left the easterly direction and turned to the left. He marched to Naipâl, a distance of 20 *farsakh*, most of which was ascending country. From Naipâl he came to Bhôteshar in thirty days, a distance of nearly 80 *farsakh*, in which there is more ascending than descending country. And there is a water which is several times crossed on bridges consisting of planks tied with cords to two canes, which stretch from rock to rock, and are fastened to milestones constructed on either side. People carry the burdens on their shoulders over such a bridge, whilst below, at a depth of 100 yards, the water foams as white as snow, threatening to shatter the rocks. On the other side of the bridges, the burdens are transported on the back of goats. My reporter told me that he had there seen gazelles with four eyes; that this was not an accidental misformation of nature, but that the whole species was of this nature.

"Bhôteshar is the first frontier of Tibet. There the language changes as well as the costumes and the anthropological character of the people. Thence the distance to the top of the highest peak is 20 *farsakh*. From the height of this mountain, India appears as a black expanse below the mist, the mountains lying below this peak like small hills, and Tibet and China

appear as red. The descent towards Tibet and China is less than one *farsakh*."

From Kanoj to Banavâs. Page 99.

Marching from Kanoj towards the south-east, on the western side of the Ganges, you come to the realm of *Jajâhâtî*, 30 *farsakh* from Kanoj. The capital of the country is *Kajûrâha*. Between this town and Kanoj there are two of the most famous fortresses of India, Gwâliyar (Gwalior) and Kâlanjar. *Dahâla* [—*farsakh*], a country the capital of which is Tiaurî, and the ruler of which is now Gangeya.

The realm of *Kannakara*, 20 *farsakh*. *Apsûr*, *Banavâs*, on the sea-coast.

From Kanoj to Bazâna.

Marching from Kanoj towards the south-west, you come to *Âsî*, 18 *farsakh* from Kanoj; *Sahanyâ*, 17 *farsakh*; *Jandrâ*, 18 *farsakh*; *Râjaurî*, 15 *farsakh*; *Bazâna*, the capital of Guzarat, 20 *farsakh*. This town is called *Nârâyan* by our people. After it had fallen into decay the inhabitants migrated to another place called Jadûra(?).

From Mâhûra to Dhâr.

The distance between Mâhûra and Kanoj is the same as that between Kanoj and Bazâna, viz. 28 *farsakh*. If a man travels from Mâhûra to Ûjain, he passes through villages which are only five *farsakh* and less distant from each other. At the end of a march of 35 *farsakh*, he comes to a large village called *Dûdahî*; thence to *Bâmahûr*, 17 *farsakh* from Dûdahî; *Bhâilsân*, 5 *farsakh*, a place most famous among the Hindus. The name of the town is identical with that of the idol worshipped there. Thence to *Ardîn*, 9 *farsakh*. The idol worshipped there is called *Mahakâla*. *Dhâr*, 7 *farsakh*.

From Bazâna to Mandagîr.

Marching from Bazâna southward, you come to *Maiwâr*, 25 *farsakh* from Bazâna. This is a kingdom the capital of which is *Jattaraur*. From this town to Mâlavâ and its capital, *Dhâr*, the distance is 20 *farsakh*. The city of Ûjain lies 7 *farsakh* to the east of *Dhâr*.

From Ûjain to Bhâilasân, which likewise belongs to Mâlavâ, the distance is 10 *farsakh*.

Marching from Dhâr southward, you come to *Bhûmihara*, 20 *farsakh* from Dhâr; *Kand*, 20 *farsakh*; *Namâvur*, on the banks of the Narmadâ (Nerbudda), 10 *farsakh*; *Alîspûr*, 20 *farsakh*; *Mandagîr*, on the banks of the river Gôdâvar, 60 *farsakh*.

From Dhâr to Tâna.

Again, marching from Dhâr southward, you come to the valley of *Namiyya*, 7 *farsakh* from Dhar; *Mahratta-Dêsh*, 18 *farsakh*; the province of *Kunkan*, and its capital, Tâna, on the sea-coast, 25 *farsakh*.

Notes about various animals of India.

People relate that in the plains of Kunkan, called *Dânak*, there lives an animal called *sharava* (Skr. *śarabha*). It has four feet, but also on the back it has something like four feet directed upwards. It has a small proboscis, but two big horns with which it attacks the elephant and cleaves it in two. It has the shape of a buffalo, but is larger than a *gaṇḍa* (rhinoceros). According to popular tales, it sometimes rams some animal with its horns, raises it or part of it towards its back, so that it comes to lie between its upper feet. There it becomes a putrid mass of worms, which work their way into the back of the animal. In consequence it continually rubs itself against the trees, and finally it perishes. Of the same animal people relate that sometimes, when hearing the thunder, it takes it to be the voice of some animal. Immediately it proceeds to attack this imaginary foe; in pursuing him it climbs up to the top of the mountain-peaks, and thence leaps towards him. Of course, it plunges into the depth and is dashed to pieces.

The *gaṇḍa* exists in large numbers in India, more particularly about the Ganges. It is of the build of a buffalo, has a black scaly skin, and dewlaps hanging down under the chin. It has three yellow hoofs on each foot, the biggest one forward, the others on both sides. The tail is not long; the eyes lie low, farther down the cheek than is the case with all other animals. On the top of the nose there is a single horn which is

Page 100. bent upwards. The Brahmins have the privilege of eating the flesh of the *gaṇḍa*. I have myself witnessed how an elephant coming across a young *gaṇḍa* was attacked by it. The *gaṇḍa* wounded with its horn a forefoot of the elephant, and threw it down on its face.

I thought that the *gaṇḍa* was the rhinoceros (or *karkadann*), but a man who had visited Sufâla, in the country of the Negroes, told me that the *kark*, which the Negroes call *impîlâ*, the horn of which furnishes the material for the handles of our knives, comes nearer this description than the rhinoceros. It has various colours. On the skull it has a conical horn, broad at the root, but not very high. The shaft of the horn (lit. its arrow) is black inside, and white everywhere else. On the front it has a second and longer horn of the same description, which becomes erect as soon as the animal wants to ram with it. It sharpens this horn against the rocks, so that it cuts and pierces. It has hoofs, and a hairy tail like the tail of an ass.

There are crocodiles in the rivers of India as in the Nile, a fact which led simple Aljâḥiz, in his ignorance of the courses of the rivers and the configuration of the ocean, to think that the river of Muhrân (the river Sindh) was a branch of the Nile. Besides, there are other marvellous animals in the rivers of India of the crocodile tribe, *makara*, curious kinds of fishes, and an animal like a leather-bag, which appears to the ships and plays in swimming. It is called *burlû* (porpoise?). I suppose it to be the dolphin or a kind of dolphin. People say that it has a hole on the head for taking breath like the dolphin.

In the rivers of Southern India there is an animal called by various names, *grâha*, *jalatantu*, and *tanduâ*. It is thin, but very long. People say it spies and lies in wait for those who enter the water and stand in it, whether men or animals, and at once attacks them. First it circles round the prey at some distance, until

its length comes to an end. Then it draws itself together, and winds itself like a knot round the feet of the prey, which is thus thrown off its legs and perishes. A man who had seen the animal told me that it has the head of a dog, and a tail to which there are attached many long tentacles, which it winds round the prey, in case the latter is not weary enough. By means of these feelers it drags the prey towards the tail itself, and when once firmly encircled by the tail the animal is lost.

After this digression we return to our subject.

From Bazâna to Somanâth.

Marching from Bazâna towards the south-west, you come to *Anhilvâra*, 60 *farsakh* from Bazâna; *Somanâth*, on the sea-coast, 50 *farsakh*.

From Anhilvâra to Lohârânî.

Marching from Anhilvâra southward, you come to *Lârdêsh*, to the two capitals of the country, *Bihrôj* and *Rihanjûr*, 42 *farsakh* from Anhilvâra. Both are on the sea-coast to the east of Tâna.

Marching from Bazâna towards the west, you come to *Mâltân*, 50 *farsakh* from Bazâna; *Bhâtî*, 15 *farsakh*.

Marching from Bhâtî towards the south-west, you come to *Arôr*, 15 *farsakh* from Bhâtî, a township between two arms of the Sindh River; *Bamhanwâ Almanṣûra*, 20 *farsakh*; *Lôharânî*, at the mouth of the Sindh River, 30 *farsakh*.

From Kanoj to Kashmîr.

Marching from Kanoj towards the north-north-west, you come to *Shirṣhâraha*, 50 *farsakh* from Kanoj; *Pinjaur*, 18 *farsakh*, situated on the mountains, whilst opposite it in the plain there lies the city of Tânêshar; *Dahmâla*, the capital of Jâlandhar, at the foot of the mountains, 18 *farsakh*; *Ballâwar*, 10 *farsakh*; thence marching westward, you come to *Ladda*, 13 *farsakh*; the fortress *Râjagirî*, 8 *farsakh*; thence marching northward, you come to *Kashmîr*, 25 *farsakh*.

From Kanoj to Ghazna. Page 101.

Marching from Kanoj towards the west, you come to *Diyâmau*, 10 *farsakh* from Kanoj; *Kutî*, 10 *farsakh*; *Ânâr*, 10 *farsakh*; *Mîrat*, 10 *farsakh*; *Pânipat*, 10

farsakh. Between the latter two places flows the river *Jaun*; *Kawîtal*, 10 *farsakh*; *Sunnâm*, 10 *farsakh*.

Thence marching towards the north-west, you come to *Âdittahaur*, 9 *farsakh*; *Jajjanîr*, 6 *farsakh*; *Mandahûkûr*, the capital of Lauhâwur, east of the river Irâwa, 8 *farsakh*; the river *Candrâha*, 12 *farsakh*; the river *Jailam*, west of the river Biyatta, 8 *farsakh*; *Waihind*, the capital of Kandhâr, west of the river Sindh, 20 *farsakh*; *Purshâwar*, 14 *farsakh*; *Dunpûr*, 15 *farsakh*; *Kâbul*, 12 *farsakh*; *Ghazna*, 17 *farsakh*.

Notes about Kashmîr.

Kashmîr lies on a plateau surrounded by high inaccessible mountains. The south and east of the country belong to the Hindus, the west to various kings, the Bolar-Shâh and the Shugnân-Shâh, and the more remote parts up to the frontiers of Badhakhshân, to the Wakhân-Shâh. The north and part of the east of the country belong to the Turks of Khoten and Tibet. The distance from the peak of Bhôteshar to Kashmîr through Tibet amounts to nearly 300 *farsakh*.

The inhabitants of Kashmîr are pedestrians, they have no riding animals nor elephants. The noble among them ride in palankins called *katt*, carried on the shoulders of men. They are particularly anxious about the natural strength of their country, and therefore take always much care to keep a strong hold upon the entrances and roads leading into it. In consequence it is very difficult to have any commerce with them. In former times they used to allow one or two foreigners to enter their country, particularly Jews, but at present they do not allow any Hindu whom they do not know personally to enter, much less other people.

The best known entrance to Kashmîr is from the town Babrahân, half way between the rivers Sindh and Jailam. Thence to the bridge over the river, where the water of the Kusnârî is joined by that of the Mahwî, both of which come from the mountains of Shamîlân, and fall into the Jailam, the distance is 8 *farsakh*.

Thence you reach in five days the beginning of the ravine whence the river Jailam comes; at the other end of this ravine is the watch-station *Dvâr*, on both sides of the river Jailam. Thence, leaving the ravine, you enter the plain, and reach in two more days Addishtân, the capital of Kashmîr, passing on the road the village Ûshkârâ, which lies on both sides of the valley, in the same manner as Baramûlâ.

The city of Kashmîr covers a space of four *farsakh*, being built along both banks of the river Jailam, which are connected with each other by bridges and ferry-boats. The Jailam rises in the mountains Haramakôt, where also the Ganges rises, cold, impenetrable regions where the snow never melts nor disappears. Behind them there is *Mahâcîn*, *i.e.* Great China. When the Jailam has left the mountains, and has flowed two days' journey, it passes through Addishtân. Four *farsakh* farther on it enters a swamp of one square *farsakh*. The people have their plantations on the borders of this swamp, and on such parts of it as they manage to reclaim. Leaving this swamp, the Jailam passes the town Ûshkârâ, and then enters the above-mentioned ravine.

The upper course of the Sindh river and the north and north-west frontiers of India.

The river Sindh rises in the mountains Unang in the territory of the Turks, which you can reach in the following way:—Leaving the ravine by which you enter Kashmîr and entering the plateau, then you have for a march of two more days on your left the mountains of Bolor and Shamîlân, Turkish tribes who are called *Bhattavaryân*. Their king has the title Bhatta-Shâh. Their towns are Gilgit, Aswira, and Shiltâs, and their language is the Turkish. Kashmîr suffers much from their inroads. Marching on the left side of the river, you always pass through cultivated ground and reach the capital; marching on the right side, you pass through villages, one close to the other, south of the capital, and thence you reach the mountain Kulârjak,

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which is like a cupola, similar to the mountain Dunbâwand. The snow there never melts. It is always visible from the region of Tâkeshar and Lauhâwar (Lahore). The distance between this peak and the plateau of Kashmîr is two *farsakh*. The fortress Râjâgirî lies south of it, and the fortress Lahûr west of it, the two strongest places I have ever seen. The town Râjâwarî is three *farsakh* distant from the peak. This is the farthest place to which our merchants trade, and beyond which they never pass.

This is the frontier of India from the north.

In the western frontier mountains of India there live various tribes of the Afghans, and extend up to the neighbourhood of the Sindh Valley.

The western and southern frontiers of India.

The southern frontier of India is formed by the ocean. The coast of India begins with Tîz, the capital of Makrân, and extends thence in a south-eastern direction towards the region of Al-daibal, over a distance of 40 *farsakh*. Between the two places lies the Gulf of Tûrân. A gulf is like an angle or a winding line of water penetrating from the ocean into the continent, and is dangerous for navigation, specially on account of ebb and flood. An estuary is something similar to a gulf, but is not formed by the ocean's penetrating into the continent. It is formed by an expanse of flowing water, which there is changed into standing water and is connected with the ocean. These estuaries, too, are dangerous, for the ships because the water is sweet and does not bear heavy bodies as well as salt water does.

After the above-mentioned gulf follow the small Munha, the great Munha, then the Bawârij, *i.e.* the pirates of Kacch and Sômanâth. They are thus called because they commit their robberies on sea in ships called *bûra*. The places on the coast are:—*Tawalleshar*, 50 *farsakh* from Daibal; *Lôharânî*, 12 *farsakh*; *Baga*, 12 *farsakh*; *Kacch*, where the *mukl*-tree grows, and *Bârôî*, 6 *farsakh*; *Sômanâth*, 14 *farsakh*; *Kanbâyat*,

30 *farsakh*; *Asawil*, 2 days; *Bihrôj*, 30 *farsakh* (?); *Sandân*, 50 *farsakh*; *Sâbâra*, 6 *farsakh*; *Tâna*, 5 *farsakh*.

Thence the coast-line comes to the country *Lârân*, in which lies the city of *Jîmûr*, then to *Vallabha*, *Kânjî*, *Darvad*. Next follows a great bay in which *Singaldîb* lies, *i.e.* the island Sarandîb (Ceylon). Round the bay lies the city of *Panjayâvar* (*sic*). When this city had fallen into ruins, the king, Jaur, built instead of it, on the coast towards the west, a new city which he called *Padnâr*.

The next place on the coast is *Ûmmalnâra*, then *Râmsher* (Râmeshar?) opposite Sarandîb; the distance of the sea between them is 12 *farsakh*. The distance from Panjayâvar to Râmsher is 40 *farsakh*, that between Râmsher and *Setubandha* 2 *farsakh*. Setubandha means *bridge of the ocean*. It is the dike of Râma, the son of Daśaratha, which he built from the continent to the castle Lańkâ. At present it consists of isolated mountains between which the ocean flows. Sixteen *farsakh* from Setubandha towards the east is *Kihkind*, the mountains of the monkeys. Every day the king of the monkeys comes out of the thicket together with his hosts, and settles down in particular seats prepared for them. The inhabitants of that region prepare for them cooked rice, and bring it to them on leaves. After having eaten it they return into the thicket, but in case they are neglected, this would be the ruin of the country, as they are not only numerous, but also savage and aggressive. According to the popular belief, they are a race of men changed into monkeys on account of the help which they had afforded to Râma when making war against the demons; he is believed to have bequeathed those villages to them as a legacy. When a man happens to fall in with them, and he recites to them the poetry of Râma and pronounces the incantations of Râma, they will quietly listen to him; they will even

lead on the right path him who has gone astray and give him meat and drink. At all events, thus the matter stands according to popular belief. If there is any truth in this, the effect must be produced by the melody, the like of which we have already mentioned in connection with the hunting of gazelles (v. p. 195).

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Islands in the Indian and Chinese Seas.

The eastern islands in this ocean, which are nearer to China than to India, are the islands of the *Zâbaj*, called by the Hindus *Suvarṇa-dvîpa*, *i.e.* the gold islands. The western islands in this ocean are those of the Zanj (Negroes), and those in the middle are the islands *Ramm* and the Dîva islands (Maledîva, Laccadiva), to which belong also the Ḳumair islands. It is peculiar to the Dîva islands that they rise slowly; first, there appears a sandy tract above the surface of the ocean; it rises more and more and extends in all directions, till at last it becomes a firm soil, whilst at the same time another island falls into decay and melts away, finally is submerged and disappears in the ocean. As soon as the inhabitants become aware of this process, they search for a new island of increasing fertility, transport there their cocoa-nut palms, date palms, cereals, and household goods, and emigrate to it. These islands are, according to their products, divided into two classes, the *Dîva-ḳûdha*, *i.e.* the Diva of the kauri-shells, because there they gather kauri-shells from the branches of the cocoa-nut palms which they plant in the sea, and *Dîva-kanbâr*, *i.e.* the Dîva of the cords twisted from cocoa-nut fibres, and used for fastening together the planks of the ships.

The island of *Alwâḳwâḳ* belongs to the Ḳumair islands. *Ḳumair* is not, as common people believe, the name of a tree which produces screaming human heads instead of fruits, but the name of a people the colour of whom is whitish. They are of short stature and of a build like that of the Turks. They practise the religion of the Hindus, and have the custom of piercing their

ears. Some of the inhabitants of the *Wâḳwâḳ* island are of black colour. In our countries there is a great demand for them as slaves. People fetch from thence the black ebony-wood; it is the pith of a tree, the other parts of which are thrown away, whilst the kinds of wood called *mulamma'* and *shauḥaṭ* and the yellow sandal-wood are brought from the country of the Zanj (Negroes).

In former times there were pearl-banks in the bay of Sarandîb (Ceylon), but at present they have been abandoned. Since the Sarandîb pearls have disappeared, other pearls have been found at Sufâla in the country of the Zanj, so that people say the pearls of Sarandîb have migrated to Sufâla.

On the rainfall in India.

India has the tropical rains in summer, which is called *varshakâla*, and these rains are the more copious and last the longer the more northward the situation of a province of India is, and the less it is intersected by ranges of mountains. The people of Mûltân used to tell me that they have no *varshakâla*, but the more northern provinces nearer the mountains have the *varshakâla*. In Bhâtal and Indravêdi it begins with the month Âshâḍha, and it rains continually for four months as though water-buckets were poured out. In provinces still farther northward, round the mountains of Kashmîr up to the peak of *Jûdarî* between Dunpûr and Barshâwar, copious rain falls during two and a half months, beginning with the month Śrâvaṇa. However, on the other side of this peak there is no rainfall; for the clouds in the north are very heavy, and do not rise much above the surface. When, then, they reach the mountains, the mountain-sides strike against them, and the clouds are pressed like olives or grapes, in consequence of which the rain pours down, and the clouds never pass beyond the mountains. Therefore Kashmîr has no *varshakâla*, but continual snowfall during two and a half months, beginning with Mâgha, and shortly

after the middle of Caitra continual rain sets in for a few days, melting the snow and cleansing the earth. This rule seldom has an exception; however, a certain amount of extraordinary meteorological occurrences is peculiar to every province of India.

CHAPTER XIX.

ON THE NAMES OF THE PLANETS, THE SIGNS OF THE ZODIAC, THE LUNAR STATIONS, AND RELATED SUBJECTS.

We have already mentioned, near the beginning of the book, that the language of the Hindus is extremely rich in nouns, both original and derivative, so that in some instances they call *one* thing by a multitude of different names. So I have heard them saying that they have a thousand names all meaning *sun;* and, no doubt, each planet has quite as many, or nearly as many names, since they could not do with less (for the purposes of versification). Page 104.

The names of the week-days are the best known names of the planets connected with the word *bâra*, which follows after the planet's name, as in Persian the word *shambih* follows after the number of the week-day (*dûshambih, sihshambih*, &c.) So they say— The names of the days of the week.

Âditya bâra, i.e. Sunday.	*Bṛihaspati bâra, i.e.* Thursday.
Soma bâra, i.e. Monday.	*Śukra bâra, i.e.* Friday.
Maṅgala bâra, i.e. Tuesday.	*Śanaiścara bâra, i.e.* Saturday.
Budha bâra, i.e. Wednesday.	

And thus they go on counting, beginning anew with Sunday, Monday, &c.

Muslim astronomers call the planets the *lords of the days*, and, in counting the *hours* of the day, they begin with the *dominus* of the day, and then count the planets in the order from above to below. For instance, the sun is the *dominus* of the first day, and at the same time the On the *Domini dierum.*

dominus of its first hour. The second hour is ruled by the planet of the sphere next under the sphere of the sun, *i.e.* Venus. The third hour is ruled by Mercury, and the fourth by the moon. Therewith the descending from the sun to the *æther*, *i.e.* the atmosphere of the earth, has an end, and in counting they return to Saturn. According to this system, the *dominus* of the twenty-fifth hour is the moon, and this is the first hour of Monday. So the moon is not only the *dominus* of the first hour of Monday, but also the *dominus* of the whole day.

On ὧραι καιρικαί and ὧραι ἰσημερινάι.

In all this there is only one difference between our system and that of the Hindus, viz. that *we* use the ὧραι καιρικαί, so that the thirteenth planet, counted from the *dominus diei*, is the *dominus* of the succeeding night. This is the third planet if you count in an opposite direction, *i.e.* ascending from the lower planet-spheres to the higher. On the contrary, the Hindus make the *dominus diei* the *dominus* of the whole νυχθήμερον, so that day and night follow each other without having each a separate *dominus*. This, at all events, is the practice of the people at large.

Sometimes, however, their chronological methods make me think that the ὧραι καιρικαί were not entirely unknown to them. They call the hour *hora*, and by the same name they call the half of a zodiacal sign in the calculation of the *nîmbahra*. The following calculation of the *dominus horæ* is derived from one of their astronomical handbooks:—

"Divide the distance between the sun and the degree of the *ascendens* measured by equal degrees, by 15, and add to the quotient 1, dropping a fraction if there be any. This sum is then counted off from the *dominus diei*, according to the succession of the planets from above to below." (The planet you arrive at in the end is the *dominus* of the hour in question.) This calculation is more of a nature to make us think of ὧραι

καιρικαί as having been used, than of ὧραι ἰσημερινάι.

It is a custom of the Hindus to enumerate the planets in the order of the week-days. They will persist in using it in their astronomical handbooks, as well as in other books, and they decline to use any other order, though it be much more correct. Order of the planets and their notation.

The Greeks mark the planets with figures, to fix thereby their limits on the *astrolabe* in an easily intelligible manner, images which are not letters of the alphabet. The Hindus use a similar system of abridgement; however, *their* figures are not images invented for the purpose, but the initial characters of the names of the planets, *e.g.* *â* = *Âditya*, or the sun; *c* = *Candra*, or the moon; *b* = *Budha*, or Mercury.

The following table exhibits the commonest names of the seven planets:—

The Planets.	Their Names in the Indian Language.
Sun	Âditya, sûrya, bhânu, arka, divâkara, ravi, bibatâ (?), heli.
Moon	Soma, candra, indu, himagu, śîtaraśmi, himaraśmi, śîtâṁśu, śîtadîdhiti, himamayûkha.
Mars	Maṅgala, bhaumya, kuja, âra, vakra, âvaneya, mâheya, krûrâkshi (?), rakta.
Mercury	Budha, saumya, câṅdra, jña, bodhana, vitta (?), hemna
Jupiter	Vṛihaspati, guru, jîva, devejya, devapurohita, devamantrin, aṅgiras, sûri, devapitâ.
Venus	Śukra, bhṛigu, sita, bhârgava, âsbati (?), dânavaguru, bhṛiguputra, âsphujit (?).
Saturn	Śanaiścara, manda, asita, koṇa, âdityaputra, saura, ârki, sûryaputra.

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The multiplicity of *names* of the sun as exhibited in the previous table was the cause which led the theologians to assume also a multiplicity of *suns*, so On the twelve suns

that according to them there are twelve suns, each of which rises in a particular month. The book *Vishṇu-dharma* says: "Vishṇu, *i.e.* Nârâyaṇa, who is without beginning in time and without end, divided himself for the angels into twelve parts, which became sons to Kaśyapa. These are the suns rising in the single months." Those, however, who do not believe that the multiplicity of names is the source of this theory of twelve suns, point out that the other planets also have many names, but each only one body, and that, besides, the names of the sun are not only twelve, but many more. The names are derived from words with generic meanings, *e.g. Âditya, i.e. the beginning*, because the sun is the beginning of the whole. *Savitṛi* means every being which has a progeny, and since all progeny in the world originates with the sun, he is called *Savitṛi*. Further, the sun is called *Ravi*, because he dries wet substances. The juice in the plants is called *rasa*, and he who takes it out of them is called *ravi*.

Names of the moon. Page 106.

The moon too, the companion of the sun, has many names, *e.g. Soma*, because she is *lucky*, and everything lucky is called *somagraha*, whilst all that is unlucky is called *pâpagraha*. Further, *Niśeśa, i.e.* lord of the night, *Nakshatranâtha, i.e.* lord of the lunar stations, *Dvijeśvara, i.e.* lord of the Brahmins, *Śîtâṁśu, i.e.* having a cold ray because the moon's globe is *watery*, which is a blessing to the earth. When the solar ray meets the moon, the ray becomes as cool as the moon herself, then, being reflected, it illuminates the darkness, makes the night cool and extinguishes any hurtful kind of combustion wrought by the sun. Similarly the moon is also called *Candra*, which means the *left eye of Nârâyaṇa*, as the sun is his right eye.

The names of the months.

The following table exhibits the names of the months. Disturbances and differences in lists of these names proceed from the causes which we shall mention (v. p. 228) when speaking of the enumeration of the different earths.

The Months.	Their Suns according to the *Vishṇu-dharma*.	The Meaning of these Names according to the *Vishṇu-dharma*.	The Suns according to the *Âditya-purâṇa*.	Vernacular Names.
Caitra . .	Vishṇu .	Moving about in heaven, not resting . . .	Aṁśumant .	Ravi.
Vaiśâkha .	Aryaman .	Punishing and beating the rebels. In consequence they do not oppose him, from fear . .	Savitṛi . .	Vishṇu.
Jyaishṭha .	Vivasvant .	He looks at the whole in general, not in detail .	Bhânu .	Dhâtṛi.
Âshâḍha . .	Aṁśu . .	Having rays	Vivasvant .	Vidhâtṛi.
Śrâvaṇa . .	Parjanya .	Affording help like the rain	Vishṇu .	Aryaman.
Bhâdrapada .	Varuṇa .	He prepares the whole	Indra . .	Bhaga.
Âśvayuja .	Indra . .	Companion and lord	Dhâtṛi .	Savitṛi.
Kârttika . .	Dhâtṛi . .	He gives benefits to men and rules them . . .	Bhaga .	Pûshan.
Mârgaśîrsha .	Mitra . .	Beloved by the world	Pûshan .	Tvashṭṛi.
Pausha . .	Pûshan .	Nourishment, for he nourishes men	Mitra . .	Arka.
Mâgha . .	Bhaga . .	Lovely, desired by the universe	Varuṇa .	Divâkara.
Phâlguna .	Tvashṭṛi .	He provides the whole with good	Aryaman .	Aṁśu.

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The names of the months derived from those of the lunar mansions.

People think, with regard to the order of the names of suns as given by the *Vishṇu-dharma*, that it is correct and undisturbed; for Vâsudeva has a separate name in each month, and his worshippers begin the months with Mârgaśîrsha, in which his name is *Keśava*. If you count his names one after the other, you find that one which he has in the month Caitra, Vishṇu, in accordance with the tradition of the *Vishṇu-dharma*.

The names of the months are related to those of the lunar stations. As two or three stations belong to each month, the name of the month is derived from one of them. We have in the following table written these particular stations with red ink (in this translation with an asterisk), in order to point out their relationship with the names of the months.

If Jupiter shines in some lunar station, the month to which this station belongs is considered as *the dominant of the year*, and the whole year is called by the name of this month.

If the names of the months given in the following table differ in some respects from those used heretofore, the reader must know that the names which we have hitherto used are the vernacular or vulgar ones, whilst those given in this table are the classical:—

The Months.		The Lunar Stations.	The Months.		The Lunar Stations.
Kârttika	3	Kṛittikâ.*	Vaiśâkha	16	Viśâkhâ.*
	4	Rohiṇî.		17	Anurâdhâ.
Mârgaśîrsha	5	Mṛigaśîrsha.*	Jyaishṭha	18	Jyeshṭhâ.*
	6	Ârdrâ.		19	Mûla.
Pausha	7	Punarvasu.	Âshâdha	20	Pûrvâshâdhâ.*
	8	Pushya.*		21	Uttarâshâdhâ.
Mâgha	9	Âślêsha.	Śrâvaṇa	22	Śravaṇa.*
	10	Maghâ.*		23	Dhanishṭa.
	11	Pûrva-phalgunî.*		24	Śatabhishaj.
Phâlguna	12	Uttara-phalgunî.	Bhâdrapadâ	25	Pûrva-bhadrapadâ.*
	13	Hasta.		26	Uttara-bhâdrapadâ.
Caitra	14	Citrâ.*		27	Revatî.
	15	Svâtî.	Âśvayuja	1	Aśvinî.*
				2	Bharaṇî.

On the names of the signs of the Zodiac. Page 108.

The signs of the zodiac have names corresponding to the images which they represent, and which are the same among the Hindus as among all other nations. The third sign is called *Mithuna*, which means a pair consisting of a boy and a girl; in fact, the same as *the Twins*, the well-known image of this sign.

Varâhamihira says in the larger book of nativities that the word applies to a man holding a lyre and a club, which makes me think that he identified Mithuna with Orion (*Aljabbâr*). And this is the opinion of common people in general, to such a degree that the station is known as *Aljauzâ* (instead of *the Twins*), though Aljauzâ does not belong to the image of this sign.

The same author explains the image of the sixth sign as *a ship, and in its hand an ear of corn.* I am inclined to think that in our manuscript there is a lacuna in this place, for *a ship* has no *hand*. The Hindus call this sign *Kanyâ, i.e.* the virgin girl, and perhaps the passage in question ran originally thus: "*A virgin in a ship holding an ear of corn in her hand.*" This is the lunar station *Alsimâk Al'a'zal* (*Spica*). The word *ship* makes one think that the author meant the lunar station *Al'awwâ* ($\beta, \eta, \gamma, \delta, \epsilon$, Virginis), for the stars of Al'awwâ form a line, the end of which is a curve (like the keel of a ship).

The image of the seventh sign he declares to be *fire*. It is called *Tulâ* = balance.

Of the tenth sign Varâhamihira says that it has the face of a goat, whilst the remainder is a *makara* (hippopotamus). However, after having compared the sign with a *makara*, he might have saved himself the trouble of attributing to it the face of a goat. Only the Greeks require the latter description, because they consider the sign as composed of two animals, as a goat in the part above the breast and as a fish in the lower part. But the aquatic animal called *makara*, as people describe

it, does not require to be explained as a composition of two animals.

The image of the eleventh sign he calls a bucket, and the name, *Kumbha*, corresponds to this statement. However, if they sometimes enumerate this sign or part of it among *the human figures*, this proves that they, following the example of the Greeks, see in it *Aquarius*.

The image of the twelfth sign he describes as the figure of two fishes, although the name of the sign in all languages signifies only one fish.

Besides the well-known names, Varâhamihira mentions also certain Indian names of the signs which are not generally known. We have united both kinds in the following table :—

The Zodiacal Signs.	Their Common Names.	Names which are not generally known.	The Zodiacal Signs.	Their Common Names.	Names which are not generally known.
0	Mesha.	Kriya.	6	Tulâ.	Jûga.
1	Vṛishan.	Tâmbiru.	7	Vṛiścika.	Kaurba.
2	Mithuna.	Jituma.	8	Dhanu.	Taukshika.
3	Karkata.	Kulîra.	9	Makara.	Agokîru.
4	Simha.	Liyaya.	10	Kumbha.	Udruvaga.
5	Kanyâ.	Pârtîna.	11	Mîna.	Anta, *also* Jîtu.

It is the custom of the Hindus in enumerating the zodiacal signs not to begin with 0 for *Aries* and 1 for *Taurus*, but to begin with 1 for *Aries* and 2 for *Taurus*, &c., so that *Pisces* are No. 12.

CHAPTER XX.

ON THE BRAHMÂṆḌA.

BRAHMÂṆḌA means *the egg of Brahman*, and applies in reality to the whole of heaven (*αἰθήρ*), on account of its being round, and of the particular kind of its motion. It applies even to the whole world, in so far as it is divided into an upper and an under part. When they enumerate the heavens, they call the sum of them Brahmâṇḍa. The Hindus, however, are devoid of training in astronomy, and have no correct astronomical notions. In consequence, they believe that the earth is at rest, more particularly as they, when describing the bliss of paradise as something like worldly happiness, make the earth the dwelling-place of the different classes of gods, angels, &c., to whom they attribute locomotion and the direction from the upper worlds to the lower.

The egg of Brahman, its coming forth from the water. Page 109.

According to the enigmatic expressions of their tradition, the water was before every other thing, and it filled the space of the whole world. This was, as I understand them, at the beginning of the day of the soul (*purushâhorâtra*, p. 332), and the beginning of formation and combination. Further, they say the water was rolling and foaming. Then something white came forth from the water, of which the Creator created the egg of Brahman. Now, according to some, the egg broke; Brahman came forth from it, the one half became the heaven, the other the earth, and the broken bits between the two halves became the rains. If they said *moun-*

tains instead of *rains*, the matter would be somewhat more plausible. According to others, God spoke to Brahman: "I create an egg, which I make for thy dwelling in it." He had created it of the above mentioned foam of the water, but when the water sank and was absorbed, the egg broke into two halves.

Greek parallel: Asclepius.

Similar opinions were held by the ancient Greeks regarding Asclepius, the inventor of the medical art; for, according to Galenus, they represent him as holding an egg in his hand, whereby they mean to indicate that the world is round, the egg an image of the universe, and that the whole world needs the medical art. Asclepius does not hold a lower position in the belief of the Greeks than Brahman in the belief of the Hindus, for they say that he is a divine power, and that his name is derived from his action, *i.e.* protecting against dryness, which means death, because death occurs when dryness and cold are prevalent. As for his natural origin, they call him the son of Apollo, the son of Phlegyas (?), and the son of Kronos, *i.e.* the planet Saturn. By this system of affiliation they mean to attribute to him the force of a threefold god.

Water the first element of creation. The egg of Brahman broken in two halves.

The theory of the Hindus, that the water existed before all creation, rests on this, that it is the cause of the cohesion of the atoms of everything, the cause of the growing of everything, and of the duration of life in every animated being. Thus the water is an instrument in the hand of the Creator when he wants to create something out of matter. A similar idea is propounded by the Koran xi. 9: "And his (God's) *throne was on the water*." Whether you explain it in an external way as an individual body called by this name, and which God orders us to venerate, or whether you give it the intrinsic meaning of *realm*, *i.e.* God's realm, or the like, in any case the meaning is this, that at that time beside God there was nothing but the water and his throne. If this our book were not restricted to

the ideas of one single nation, we should produce from the belief of the nations who lived in ancient times in and round Babel ideas similar to the egg of Brahman, and even more stupid and unmeaning than that.

The theory of the division of the egg into two halves proves that its originator was the contrary of a scientific man, one who did not know that the heaven comprehends the earth, as the shell of the egg of Brahman comprehends its yolk. He imagined the earth to be below, and the heaven in only one of the six directions from the earth, *i.e.* above it. If he had known the truth, he might have spared himself the theory of the breaking of the egg. However, he wished by his theory to describe one half of the egg as spread out for the earth, and the other half as placed upon it for a cupola, trying to outvie Ptolemy in the planispheric representation of a globe, but without success. Page 110.

There have always been similar fancies afloat, which everybody interprets as best suits his religion and philosophy. So Plato says in his *Timæus* something like the Brahmânda: "The Creator cut a straight thread into halves. With each of them he described a circle, so that the two circles met in two places, and one of them he divided into seven parts." In these words he hints, as is his custom, at the original two motions of the universe (from east to west in the diurnal rotation, and from west to east in the precession of the equinoxes), and at the globes of the planets. Quotation from Plato's *Timæus*.

Brahmagupta says in the first chapter of the *Brahma-siddhânta*, where he enumerates the heavens, placing the moon in the nearest heaven, the other planets in the following ones, and Saturn in the seventh: "The fixed stars are in the eighth heaven, and this has been created round in order to last for ever, that in it the pious may be rewarded, the wicked be punished, since there is nothing behind it." He indicates in this chapter that the heavens are identical with the spheres, and he Quotation from Brahmagupta.

gives them in an order which differs from that of the traditional literature of their creed, as we shall show hereafter in the proper place. He indicates, too, that the *round* can only be slowly influenced from without. He evinces his knowledge of the Aristotelic notions regarding the round form and the rotating motion, and that there is no body in existence behind the spheres.

If it is of this description, evidently Brahmâṇḍa is the totality of the spheres, *i.e.* the *αἰθήρ*, in fact, the universe, for retribution in another life takes place, according to the ideas of the Hindus, within it.

Quotation from the *Siddhânta* of Pulisa.

Pulisa says in his *Siddhânta:* "The totality of the world is the sum of earth, water, fire, wind, and heaven. The latter was created behind the darkness. It appears to the eyes as blue, because it is not reached by the rays of the sun and not illuminated by them like the watery non-igneous globes, *i.e.* the bodies of the planet and the moon. When the rays of the sun fall upon these and the shadow of the earth does not reach them, their darkness disappears and their figures become visible in the night. The light-giver is only one, all the others receive the light from him." In this chapter Pulisa speaks of the utmost limit that can be reached, and calls it *heaven.* He places it *in darkness,* since he says that it exists in a place which is not reached by the rays of the sun. The question as to the blue-grey colour of heaven which is perceived by the eye is of too great an extent to be touched upon here.

Quotations from Brahmagupta, Vasishtha, Balabhadra, and Aryabhaṭa.

Brahmagupta says in the above-mentioned chapter: "Multiply the cycles of the moon, *i.e.* 57,753,300,000, by the number of the *yojana* of her sphere, *i.e.* 324,000, and you get as the product 18,712,069,200,000,000, *i.e.* the number of the *yojana* of the sphere of the zodiac." Of the *yojana* as a measure of distance we have already spoken in the chapter on metrology (ch. xv. p. 167). We give the just-mentioned calculation of Brahmagupta, simply reproducing his words without any re-

sponsibility of our own, for he has not explained on what reason it rests. Vasishtha says that the Brahmânḍa comprehends the spheres, and the just-mentioned numbers are the measure of the Brahmânḍa, since the sphere of the zodiac is connected with it. The commentor Balabhadra says: "We do not consider these numbers as a measure of heaven, for we cannot define its greatness, but we consider them as the utmost limit to which the human power of vision can penetrate. There is no possibility of human perception reaching above it; but the other spheres differ from each other in greatness and smallness, so as to be visible in various degrees." The followers of Âryabhaṭa say: "It is sufficient for us to know the space which is reached by the solar rays. We do not want the space which is not reached by the solar rays, though it be in itself of an enormous extent. That which is not reached by the rays is not reached by the perception of the senses, and that which is not reached by perception is not knowable." Page 111.

Criticisms on the different theories. The question of the ninth sphere.

Let us now examine the bearing of the words of these authors. The words of Vasishtha prove that the Brahmânḍa is a globe comprehending the eighth or so called zodiacal sphere, in which the fixed stars are placed, and that the two spheres touch each other. Now we on our own part were already obliged to assume an eighth sphere, but there is no reason why we should suppose a ninth one.

On this head the opinions of people are divided. Some hold the existence of a ninth sphere to be a necessity on account of the rotation from east to west, in so far as it moves in this direction and compels everything which it comprehends to move in the same direction. Others assume the ninth sphere on account of the same motion, but suppose that it by itself is motionless.

The tendency of the representatives of the former theory is perfectly clear. However, Aristotle has proved

that each moving body is brought into motion by something moving which is not within itself. So also this ninth sphere would presuppose a *mover* outside itself. What, however, should prevent this *mover* from putting the eight spheres into motion without the intermediation of a ninth sphere?

Aristotle, Ptolemy, Johannes Grammaticus.

As regards the representatives of the second view, one might almost think that they had a knowledge of the words of Aristotle which we have quoted, and that they knew that the first mover is motionless, for they represent the ninth sphere as motionless and as the source of the east to west rotation. However, Aristotle has also proved that the first mover is not a body, whilst he must be a body, if they describe him as a globe, as a sphere, and as comprehending something else within itself and motionless.

Thus the theory of the ninth sphere is proved to be an impossibility. To the same effect are the words of Ptolemy in the preface of his *Almagest:* "The first cause of the first motion of the universe, if we consider the motion by itself, is according to our opinion an invisible and motionless god, and the study of this subject we call *a divine one*. We perceive his action in the highest heights of the world, but as an altogether different one from the action of those substances which can be perceived by the senses."

These are the words of Ptolemy on the first *mover*, without any indication of the ninth sphere. But the latter is mentioned by Johannes Grammaticus in his refutation of Proclus, where he says: "Plato did not know a ninth, starless sphere." And, according to Johannes, it was this, *i.e.* the negation of the ninth sphere, which Ptolemy meant to say.

Finally, there are other people who maintain that behind the last limit of motion there is an infinite resting body or an infinite *vacuum*, or something which they declare to be neither a *vacuum* nor a *plenum*. These

theories, however, have no connection whatsoever with our subject.

Balabhadra gives us the impression of holding the same opinion as those who think that heaven or the heavens are a compact body holding in equilibrium all heavy bodies and carrying them, and that it is above the spheres. To Balabhadra it is just as easy to prefer tradition to eyesight, as it is difficult to us to prefer doubt to a clear proof.

The truth is entirely with the followers of Âryabhata who give us the impression of really being men of great scientific attainments. It is perfectly evident that Brahmâṇḍa means the *αἰθήρ*, together with all products of creation in it.

CHAPTER XXI.

DESCRIPTION OF EARTH AND HEAVEN ACCORDING TO THE RELIGIOUS VIEWS OF THE HINDUS, BASED UPON THEIR TRADITIONAL LITERATURE.

On the seven earths. Page 112.

THE people of whom we have spoken in the preceding chapter think that the earths are seven like seven covers one above the other, and the upper one they divide into seven parts, differing from our astronomers, who divide it into *κλίματα*, and from the Persians, who divide it into *Kishvar*. We shall afterwards give a clear explanation of their theories derived from the first authorities of their religious law, to expose the matter to fair criticism. If something in it appears strange to us, so as to require a commentary, or if we perceive some coincidence with others, even if both parties missed the mark, we shall simply put the case before the reader, not with the intention of attacking or reviling the Hindus, but solely in order to sharpen the minds of those who study these theories.

Differences in the sequence of the earths explained as resulting from the copiousness of the language.

They do not differ among themselves as to the number of earths nor as to the number of the parts of the upper earth, but they differ regarding their names and the order of these names. I am inclined to derive this difference from the great verbosity of their language, for they call one and the same thing by a multitude of names. For instance, they call the sun by a thousand different names according to their own statement, just as the Arabs call the lion by nearly as many. Some of these names are original, while others are derived from the changing conditions of his life or his actions and faculties. The Hindus and their like boast of this copiousness, whilst in reality it is one of the greatest faults of

the language. For it is the task of language to give a name to everything in creation and to its effects, a name based on general consent, so that everybody, when hearing this name pronounced by another man, understands what he means. If therefore one and the same name or word means a variety of things, it betrays a defect of the language and compels the hearer to ask the speaker what he means by the word. And thus the word in question must be dropped in order to be replaced either by a similar one of a sufficiently clear meaning, or by an epithet describing what is really meant. If one and the same thing is called by many names, and this is not occasioned by the fact that every tribe or class of people uses a separate one of them, and if, in fact, one single name would be sufficient, all the other names save this one are to be classified as mere nonsense, as a means of keeping people in the dark, and throwing an air of mystery about the subject. And in any case this copiousness offers painful difficulties to those who want to learn the whole of the language, for it is entirely useless, and only results in a sheer waste of time.

Frequently it has crossed my mind that the authors of books and the transmitters of tradition have an aversion to mentioning the earths in a definite arrangement, and limit themselves to mentioning their names, or that the copyists of the books have arbitrarily altered the text. For those men who explained and translated the text to me were well versed in the language, and were not known as persons who would commit a wanton fraud.

The earths according to the *Âditya-Purâṇa*.

The following table exhibits the names of the earths, as far as I know them. We rely chiefly on that list, which has been taken from the *Âditya-purâṇa*, because it follows a certain rule, combining every single earth and heaven with a single member of the members of the sun. The heavens are combined with the members from the skull to the womb, the earths with the members from the navel to the foot. This mode of comparison illustrates their sequence and preserves it from confusion:—

The Number of the Earths.	Âdityа-Purâṇa.		Vishṇu-Purâṇa.	Vâyu-Purâṇa.		Vernacular Names.
	What Members of the Sun they Represent.	Their Names.		Their Names.	Their Epithets.	
I.	The navel.	Tâla.	Atala.	Âbhâstala.	Kṛishṇa-bhûmi, the dark earth.	Amśu (?)
II.	The thighs.	Sutâla.	Vitala.	Ilâ (?)	S'ukla-bhûmi, the bright earth.	Ambaratâla.
III.	The knees.	Pâtâla.	Nitala.	Nitala.	Rakta-bhûmi, the red earth.	S'arkara (?) (Sakkaru).
IV.	Under the knees.	Âśâla (?)	Gabhastimat.	Gabhastala.	Pîta-bhûmi, the yellow earth.	Gabhastimat.
V.	The calves.	Viśâla (?)	Mahâkhya (?)	Mahâtala.	Pâshâṇa-bhûmi, the earth of marble.	Mahâtala.
VI.	The ankles.	Mṛittâla.	Sutala.	Sutala.	S'ilâtala, the earth of brick.	Sutâla.
VII.	The feet.	Rasâtala.	Jâgara (?)	Pâtâla.	Suvarṇa-varṇa, the gold-coloured earth.	Rasâtala.

THE SPIRITUAL BEINGS LIVING ON THE SEVEN EARTHS ACCORDING TO THE VÂYU-PURÂṆA.

Page 114.

Of the Dânavas—Namuci, Śaṅkukarṇa, Kabandha (?), Nishkubâda (?), Śûladanta, Lohita, Kaliṅga, Śvâpada; and the master of the serpents—Dhanañjaya, Kâliya.

Of the Daityas—Suraksha, Mahâjambha, Hayagrîva, Kṛishṇa, Janarta (?), Śaṅkhâkhsha, Gomukha; and of the Râkshasa—Nîla, Megha, Krathanaka, Mahoshṇîsha, Kambala, Aśvatara, Takshaka.

Of the Dânavas—Rada (?), Anuhlâda, Agnimukha, Târakâksha, Triśira, Śiśumâra; and of the Râkshasa—Cyavana, Nanda, Viśâla. And there are many cities in this world.

Of the Daityas—Kâlanemi, Gajakarṇa, Uñjara (?); and of the Râkshasa—Sumâli, Muñja, Vṛikavaktra, and the large birds called Garuda.

Of the Daityas—Virocana, Jayanta (?), Agnijihva, Hiraṇyâksha; and of the Râkshasa—Vidyujjihva, Mahâmegha; the serpent Karmâra, Svastikajaya.

Of the Daityas—Kesari; and of the Râkshasa—Ûrdhvakuja (?), Śataśîrsha, *i.e.* having a hundred heads, a friend of Indra; Vâsuki, a serpent.

The king Bali; and of the Daitya Mucukunda. In this world there are many houses for the Râkshasa, and Vishṇu resides there, and Śesha, the master of the serpents.

On the seven heavens. Quotations from Johannes Grammaticus, Plato, and Aristotle.

After the earths follow the heavens, consisting of seven stories, one above the other. They are called *loka*, which means "*gathering-place*." In a similar manner also the Greeks considered the heavens as gathering-places. So Johannes Grammaticus says in his refutation of Proclus: "Some philosophers thought that the sphere called γαλαξίας, i.e. *milk*, by which they mean the milky way, is a dwelling-place for rational souls." The poet Homer says: "Thou hast made the pure heaven an eternal dwelling-place for the gods. The winds do not shake it, the rains do not wet it, and the snow does not destroy it. For in it there is resplendent clearness without any covering cloud."

Plato says: "God spoke to the seven planets: You are the gods of the gods, and I am the father of the actions; I am he who made you so that no dissolution

Page 115. is possible; for anything bound, though capable of being loosened, is not exposed to destruction, as long as its order is good."

Aristotle says in his letter to Alexander: "The world is the order of the whole creation. That which is above the world, and surrounds it on the sides, is the dwelling-place of the gods. Heaven is full of the gods to which we give the name of stars." In another place of the same book he says, "The earth is bounded by the water, the water by the air, the air by the fire, the fire by the *αἰθήρ*. Therefore the highest place is the dwelling-place of the gods, and the lowest, the home of the aquatic animals."

There is a similar passage in the *Vâyu-Purâṇa* to this effect, that the earth is held in its grasp by the water, the water by the pure fire, the fire by the wind, the wind by heaven, and heaven by its lord.

The names of the *lokas* do not differ like those of the earths. There is a difference of opinion only regarding their order. We exhibit the names of the *lokas* in a table similar to the former (p. 230).

The Number of the Heavens.	What members of the Sun they represent according to the *Âditya-Purâṇa*.	Their Names according to the *Âditya*, *Vâyu* and *Vishṇu Purâṇas*.
I.	The stomach.	Bhûrloka.
II.	The breast.	Bhuvarloka.
III.	The mouth.	Svarloka.
IV.	The eyebrow.	Maharloka.
V.	The forehead.	Janaloka.
VI.	Above the forehead.	Tapoloka.
VII.	The skull.	Satyaloka.

Criticisms on the commentator of Patañjali. Page 116.

This theory of the earths is the same with all Hindus, except alone the commentator of the book of Patañjali. He had heard that the *Pitaras*, or *fathers*, had their gathering-place in the sphere of the moon, a tradition built on the theories of the astronomers. In conse-

quence he made the lunar sphere the first heaven, whilst he ought to have identified it with *Bhûrloka*. And because by this method he had one heaven too many, he dropped the *Svarloka*, the place of reward.

The same author differs besides in another point. As the seventh heaven, Satyaloka, is in the Purâṇas also called *Brahmaloka*, he placed the Brahmaloka above the Satyaloka, whilst it would have been much more reasonable to think that in this case one and the same thing is called by two different names. He ought to have omitted the Brahmaloka, to have identified Pitṛiloka with Bhûrloka, and not to have left out the Svarloka.

So much about the seven earths and the seven heavens. We shall now speak of the division of the surface of the uppermost earth and of related subjects.

The system of Dvîpas and seas.

Dîp (*dvîpa*) is the Indian word for *island*. Hence the words *Sangaladîp* (Simhaladvîpa), which we call Serendîb, and the *Dîbajât* (Maledives, Laccadives). The latter are numerous islands, which become, so to speak, decrepit, are dissolved and flattened, and finally disappear below the water, whilst at the same time other formations of the same kind begin to appear above the water like a streak of sand which continually grows and rises and extends. The inhabitants of the former island leave their homes, settle on the new one and colonise it.

According to the religious traditions of the Hindus, the earth on which we live is round and surrounded by a sea. On the sea lies an earth like a collar, and on this earth lies again a round sea like a collar. The number of dry collars, called *islands*, is seven, and likewise that of the seas. The size of both *dvîpas* and seas rises in such a progression that each *dvîpa* is the double of the preceding *dvîpa*, each sea the double of the preceding sea, *i.e.* in the progression of the powers of two. If the middle earth is reckoned as one, the

size of all seven earths represented as collars is 127. If the sea surrounding the middle earth is counted as one, the size of all seven seas represented as collars is 127. The total size of both earths and seas is 254.

The size of the Dvîpas and seas, according to the commentator of Patañjali and the *Vâyu-Purâṇa.*

The commentator of the book of Patañjali has adopted as the size of the middle earth 100,000 *yojana.* Accordingly, the size of all the earths would be 12,700,000 *yojana.* Further he adopts as the size of the sea which surrounds the middle earth 200,000 *yojana.* Accordingly, the size of all the seas would be 25,400,000 *yojana,* and the total size of all the earths and seas 38,100,000 *yojana.* However, the author himself has not made these additions. Therefore we cannot compare his numbers with ours. But the *Vâyu-Purâṇa* says that the diameter of the totality of earths and seas is 37,900,000 *yojana,* a number which does not agree with the above-mentioned sum of 38,100,000 *yojana.* It cannot be accounted for, unless we suppose that the number of earths is only six, and that the progression begins with the number 4 instead of 2. Such a number of seas (*i.e.* 6) may possibly be explained in this way, that the seventh one has been dropped, because the author only wanted to find the size of the continents, which induced him to leave the last surrounding sea out of the calculation. But if he once mentions the continents he must also mention all the seas which surround them. Why he has commenced the progression with 4 instead of 2, I cannot account for by any of the principles of the calculation as they have been laid down.

Each *dvîpa* and sea has a separate name. As far as we know them, we place them before the reader in the following table, and hope that the reader will excuse us for so doing.

The number of the Dvîpas and Seas.	Matsya-Purâṇa.		The Commentator of Patañjali—Vishṇu-Purâṇa.		Vernacular Names.	
	Dvîpas.	Seas.	Dvîpas.	Seas.	Dvîpas.	Seas.
I.	Jambu-dvîpa.	Lavaṇa, *i.e.* salt.	Jambu, the name of a tree.	Kshâra, *i.e.* salt.	Jambu.	Lavaṇa-samudra.
II.	Śâka-dvîpa.	Kshîrodaka, *i.e.* milk.	Plaksha, the name of a tree.	Ikshu, *i.e.* sugar-cane.	Śâka.	Ikshu.
III.	Kuśa-dvîpa.	Ghṛitamaṇḍa, *i.e.* butter.	Śâlmali, the name of a tree.	Surâ, *i.e.* wine.	Kuśa.	Surâ.
IV.	Krauñca-dvîpa.	Dadhimaṇḍa, *i.e.* thick milk.	Kuśa, the name of a plant.	Sarpis, *i.e.* butter.	Krauñca.	Sarpis.
V.	Śâlmali-dvîpa.	Surâ, *i.e.* rice-wine.	Krauñca, the hosts.	Dadhi, *i.e.* sour-milk.	Śâlmali.	Dadhisâgara.
VI.	Gomeda-dvîpa.	Ikshurasoda, *i.e.* the juice of sugar-cane.	Śâka, the name of a tree.	Kshîra, *i.e.* milk.	Gomeda.	Kshîra.
VII.	Pushkara-dvîpa.	Svâdûdaka, *i.e.* sweet water.	Pushkara, the name of a tree.	Svâdûdaka, *i.e.* sweet water.	Pushkara.	Pâniya.

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The differences of the traditions as exhibited by this table cannot be accounted for in any rational way. They can hardly have sprung from any other source but from arbitrary, accidental changes of the enumeration. The most appropriate of these traditions is that of the *Matsya-Purâṇa*, because it enumerates the dvîpas and seas one after the other according to a fixed order, a sea surrounding an island, an island surrounding a sea, the enumeration proceeding from the centre to the periphery.

We shall now in this place record some related subjects, though it would perhaps be more correct to treat of them in some other part of the book.

Quotation from the commentator of Patañjali.

The commentator of the book of Patañjali, wishing to determine the dimension of the world, begins from below and says: "The dimension of the *darkness* is one *koṭi* and 85 *laksha* yojana, *i.e.* 18,000,000 *yojana*.

"Then follows *Naraka*, *i.e.* the hells, of the dimension of 13 *koṭi* and 12 *laksha*, *i.e.* 131,200,000 *yojana*.

"Then follows darkness, of one *laksha*, *i.e.* 100,000 *yojana*.

"Above it lies the earth *Vajra*, so called on account of its hardness, because the word means *a diamond*, and *the molten thunder-bolt*, of 34,000 *yojana*.

"Above it lies the middle earth *Garbha*, of 60,000 *yojana*.

"Above it lies *the golden earth*, of 30,000 *yojana*.

"Above this the seven earths, each of 10,000 *yojana*, which makes the sum of 70,000 *yojana*. The upper one of them is that which contains the *dvîpas* and the seas.

"Behind the sweet-water sea lies *Lokâloka*, which means a *not-gathering-place*, *i.e.* a place without civilisation and inhabitants.

"Thereupon follows the gold-earth of one *Koṭi*, *i.e.* 10,000,000 *yojana*; above it the *Pitṛiloka* of 6,134,000 *yojana*.

"The totality of the seven *lokas*, which is called *Brah-*

mâṇḍa, has the dimension of 15 *koṭi*, *i.e.* 150,000,000 *yojana*. And above this is the darkness *tamas*, similar to the lowest darkness, of 18,500,000 *yojana*."

We on our part found it already troublesome to enumerate all the seven seas, together with the seven earths, and now this author thinks he can make the subject more easy and pleasant to us by inventing some more earths below those already enumerated by ourselves!

The *Vishṇu-Purâṇa*, when treating of similar subjects, says: "There is a serpent under the seventh lowest earth, which is called *Śeshâkhya*, worshipped among the spiritual beings. It is also called *Ananta*. It has a thousand heads, and bears the earths without being molested by their heavy weight. These earths, one stored above the other, are gifted with good things and happiness, adorned with jewels, illuminated by their own rays, not by those of sun and moon. The latter two luminaries do not rise in them. Therefore their temperature is always equal, they have everlasting fragrant flowers, blossoms of trees and fruit; their inhabitants have no notion of time, since they do not become aware of any motions by counting them. Their dimension is 70,000 *yojana*, the dimensions of each being 10,000. Nârada, the Rishi, went down in order to see them, and to acquaint himself with the two kinds of beings which inhabit them, the *Daitya* and *Dânava*. When he then found the bliss of paradise to be rather insignificant in comparison with that of these earths, he returned to the angels, giving his report to them, and rousing their admiration by his description."

Further, the following passage: "Behind the sweet-water sea lies the gold earth, the double of the totality of the *dvîpas* and seas; but not inhabited by men nor by demons. Behind it lies *Lokâloka*, a mountain of the height of 10,000 *yojana*, and of the same breadth. Its whole dimension is 50 *koṭi*, *i.e.* 500,000,000 *yojana*." Page 119.

The totality of all this is in the Hindu language

sometimes called *dhâtṛi, i.e. holding all things*, and sometimes *vidhâtṛi, i.e. letting loose all things*. It is also called *the dwelling-place of every living being*, and by various other names, which differ as people differ in their opinions about the *vacuum*. Those who believe in the *vacuum* make it the cause why all bodies are attracted towards it, whilst those who deny the *vacuum* declare that it is not the cause of the attraction.

Then the author of the *Vishṇu-Purâṇa* returns to the *Lokas* and says: "Everything which a foot can tread upon and a ship sail in, is *Bhûrloka*." This seems to be an indication of the surface of the uppermost earth. The air, which is between the earth and the sun, in which the Siddhas, the Munis, and the Gandharvas, the musicians, wander to and fro, is the *Bhuvarloka*. The whole of these three earths is called *the three prithivî*. That which is above them is *Vyâsa-maṇḍala, i.e.* the realm of Vyâsa. The distance between the earth and sun is 100,000 *yojana*, that between the sun and the moon is the same. The distance between the moon and Mercury is two *lakshas, i.e.* 200,000 *yojana*, that between Mercury and Venus is the same. The distances between Venus and Mars, Mars and Jupiter, Jupiter and Saturn, are equal, each being 200,000 *yojana*. The distance between Saturn and the Great Bear is 100,000 *yojana*, and that from the Great Bear to the pole is 1000 *yojana*. Above it is *Maharloka*, at a distance of 20 millions of *yojana*; above it, the *Jinaloka*, at a distance of 80 millions; above it, *Pitriloka*, at a distance of 480 millions; above it, *Satyaloka*."

This sum, however, is more than thrice the sum which we have mentioned on the authority of the commentator of the book of Patañjali, *i.e.* 150,000 *yojana*. But such is the custom of the copyists and scribes in every nation, and I cannot declare the students of the Purâṇas to be free from it, for they are not men of exact learning.

CHAPTER XXII.

TRADITIONS RELATING TO THE POLE.

The origin of the south pole, and the story of Somadatta.

THE pole, in the language of the Hindus, is called *dhruva*, and the axis *śalâka*. The Hindus, with the exception of their astronomers, speak always only of *one* pole, the reason of which is their belief in *the dome of heaven*, as we have heretofore explained. According to *Vâyu-Purâṇa*, heaven revolves round the pole like a potter's wheel, and the pole revolves round itself, without changing its own place. This revolution is finished in 30 *muhûrta*, *i.e.* in one *nychthemeron*.

Regarding the south pole, I have heard from them only one story or tradition, viz. the following. They had once a king called Somadatta, who by his noble deeds had deserved paradise; but he did not like the idea of his body being torn away from his soul when he should depart into the other world. Now he called on the Ṛishi Vasishṭha, and told to him that he loved his body, and did not wish to be separated from it; but the Ṛishi informed him that it was impossible to take along with oneself the material body from this world into paradise. Thereupon he laid his desire before the children of Vasishṭha; however, these spat in his face, scoffed at him, and changed him into a *caṇḍâla* with ear-rings in both ears, and clad in a *kurṭak* (*i.e.* a short shirt worn by the women round the shoulders, reaching down to the middle of the body). When he came in this condition to the Ṛishi, Viśvâmitra, the latter found him to be a disgusting spectacle, and asked him what

was the reason of his appearing so, whereupon Somadatta informed him, and told him the whole story. Now Viśvâmitra became very angry on his account; he
Page 120. ordered the Brahmans into his presence in order to perform a great sacrifice, among those also the children of Vasishṭha, and he spoke to them: "I wish to make a new world, and a new paradise for this pious king, that there he may obtain the fulfilment of his wish." Thereupon he began to make the pole and the Great Bear in the south, but then Indra, the ruler, and the spiritual beings began to fear him. They went to him, humbled themselves before him, and asked him to desist from the work he had commenced on this condition, that they would carry Somadatta *with his body*, just as it was, into paradise. This they did, and in consequence the Rishi desisted from making a second world, but that which he had already made up to that moment remained.

It is well known that the north pole with us is called the Great Bear, the south pole Canopus. But some of our people (Muslims) who do not rise above the uneducated mass, maintain that in the south of heaven too there is a Great Bear of the same shape as the northern, which revolves round the southern pole.

Such a thing would not be impossible nor even strange, if the report about it came from a trustworthy man, who had made long sea-voyages. Certainly in southern regions stars are seen which we do not know in our latitudes. So Śrîpâla says that the people of Multân see in summer time a red star a little below the meridian of Canopus, which they call *Śûla, i.e. the beam of crucifixion*, and that the Hindus consider it as unlucky. Therefore, when the moon stands in the station Pûrvabhadrapada, the Hindus do not travel towards the south, because this star stands in the south.

Śrîpâla on the star Śûla. Aljaihânî on the fever-star. Brahmagupta on the Śiśumâra.

Aljaihânî relates, in his Book of Routes, that on the

island Langabâlûs there is a large star visible, known as the *fever-star*. It appears in winter about morning dawn in the east as high as a date-palm tree, having an oblong shape, composed of the tail of the Small Bear and his back, and of some small stars situated there; it is called *the axe of the mill*. Brahmagupta mentions it in connection with *the Fish*. The Hindus tell rather ludicrous tales when speaking of the figure in which they represent this group of stars, viz. the figure of a four-footed aquatic animal, which they call *Śakvara* and also *Śiśumâra*. I suppose that the latter animal is the great lizard, for in Persia it is called *Susmâr*, which sounds much like the Indian *Śiśumâra*. Of this kind of animals there is also an aquatic species, similar to the crocodile and the skink. One of those tales is the following.

The story of Dhruva.

When Brahman wanted to create mankind, he divided himself into two halves, of which the right one was called *Virâj*, the left one *Manu*. The latter one is the being from whom the period of time called *Manvantara* has received its name. Manu had two sons, Priyavrata and Uttânapâda, the bow-legged king. The latter had a son called *Dhruva*, who was slighted by one of the wives of his father. On account of this, he was presented with the power to turn round all the stars as he pleased. He appeared in the Manvantara of Svayambhuva, the first of all Manvantaras, and he has for ever remained in his place.

Quotations from *Vâyu-Purâṇa* and *Vishṇu-Dharma*.

The *Vâyu-Purâṇa* says: "The wind drives the stars round the pole, which are bound to it by ties invisible to man. They move round like the beam in the olive-press, for its bottom is, as it were, standing still, whilst its end is moving round.

The *Vishṇu-Dharma* says: "Vajra, one of the children of Balabhadra, the brother of Nârâyaṇa, asked the Ṛishi Mârkaṇḍeya as to the pole, upon which he answered: When God created the world, it was dark and desert.

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Thereupon he made the globe of the sun shining, and the globes of the stars watery, receiving the light of the sun from that side of his which he turns towards them. Fourteen of these stars he placed round the pole in the shape of a *śiśumâra*, which drive the other stars round the pole. One of them, north of the pole, on the uppermost chin, is Uttânapâda, on the lowest chin Yajna, on the head Dharma, on the breast Nârâyaṇa, on the two hands towards the east the two stars Aśvinî the physicians, on the two feet Varuṇa, and Aryaman towards the west, on the penis Samwatsara, on the back Mitra, on the tail Agni, Mahendra, Marîci, and Kaśyapa."

The pole itself is Vishṇu, the ruler of the inhabitants of paradise; he is, further, the time rising, growing, getting old, and vanishing.

Further, the *Vishṇu-Dharma* says: "If a man reads this and knows it accurately, God pardons to him the sins of that day, and fourteen years will be added to his life, the length of which has been fixed beforehand."

How simple those people are! Among us there are scholars who know between 1020 to 1030 stars. Should those men breathe and receive life from God only on account of their knowledge of stars?

All the stars revolve, whatever may be the position of the pole with regard to them.

If I had found a Hindu able to point out to me with his finger the single stars, I should have been able to identify them with the star-figures known among Greeks and Arabs, or with stars in the neighbourhood in case they did not belong to any of these figures.

CHAPTER XXIII.

ON MOUNT MERU ACCORDING TO THE BELIEF OF THE AUTHORS OF THE PURÂṆAS AND OF OTHERS.

Brahmagupta on the earth and Mount Meru.

We begin with the description of this mountain, since it is the centre of the Dvîpas and seas, and, at the same time, the centre of Jambûdvîpa. Brahmagupta says: "Manifold are the opinions of people relating to the description of the earth and to Mount Meru, particularly among those who study the Purâṇas and the religious literature. Some describe this mountain as rising above the surface of the earth to an excessive height. It is situated under the pole, and the stars revolve round its foot, so that rising and setting depends upon Meru. It is called Meru because of its having the faculty of doing this, and because it depends alone upon the influence of its head that sun and moon become visible. The day of the angels who inhabit Meru lasts six months, and their night also six months."

Brahmagupta quotes the following passage from the book of *Jina*, *i.e.* Buddha: "Mount Meru is quadrangular, not round."

Balabhadra on the same subject.

The commentator Balabhadra says: "Some people say that the earth is flat, and that Mount Meru is an illuminating, light-giving body. However, if such were the case, the planets would not revolve round the horizon of the inhabitants of Meru; and if it were shining it would be visible because of its height, as the

pole above it is visible. According to some, Meru consists of gold; according to others it consists of jewels. Âryabhaṭa thinks that it has not absolute height, but only the height of *one yojana*, and that it is round, not quadrangular, the realm of the angels; that it is invisible, although shining, because it is very distant from the inhabited earth, being situated entirely in the high north, in the cold zone, in the centre of a desert called *Nandana-vana*. However, if it were of a great height, it would not be possible on the 66th degree of latitude for the whole Tropic of Cancer to be visible, and for the sun to revolve on it, being always visible without ever disappearing."

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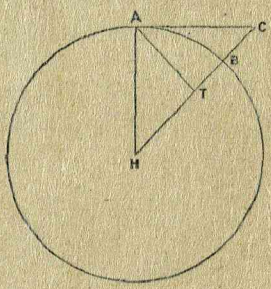
The author criticises Balabhadra.

All that Balabhadra produces is foolish both in words and matter, and I cannot find why he felt himself called upon to write a commentary if he had nothing better to say.

If he tries to refute the theory of the flatness of the earth by the planets revolving round the horizon of Meru, this argument would go nearer proving the theory than refuting it. For if the earth were a flat expanse, and everything high on earth were parallel to the perpendicular height of Meru, there would be no change of horizon, and the same horizon would be the equinox for all places on earth.



The statements of Âryabhaṭa examined by the author.

On the words of Âryabhaṭa as quoted by Balabhadra we make the following remarks.

Let A B be the globe of the earth round the centre H. Further, A is a place on the earth in the 66th degree of latitude. We cut off from the circle the arc A B, equal to the greatest declination. Then B is the place in the zenith of which the pole stands.

Further, we draw the line A C touching the globe in

the point A. This line lies in the plane of the horizon as far as the human eye reaches round the earth.

We join the points A and H with each other, and draw the line H B C, so that it is met in C by the line A C. Further, we let fall the perpendicular A T on H C. Now, it is evident that—

A T is the sine of the greatest declination;
T B the versed sine of the greatest declination;
T H the sine of the complement of the greatest declination.

And as we here occupy ourselves with Âryabhaṭa, we shall, according to his system, change the sines in *kardajât*. Accordingly—

A T = 1397.
T H = 3140.
B T = 298.

Because the angle H A C is a right angle, we have the equation—

H T : T A = T A : T C.

And the square of A T is 1,951,609. If we divide it by T H, we get as quotient 622.

The difference between this number and T B is 324, which is B C. And the relation of B C to B H, the latter being *sinus totus* = 3438, is the same as the relation of the number of *yojanas* of B C to the *yojanas* of B H. The latter number is, according to Âryabhaṭa, 800. If it is multiplied by the just-mentioned difference of 324 we get the sum of 259,200. And if we divide this number by the *sinus totus* we get 75 as quotient, which is the number of *yojanas* of B C, equal to 600 *miles* or 200 *farsakh*.

If the perpendicular of a mountain is 200 *farsakh*, the ascent will be nearly the double. Whether Mount Meru has such a height or not, nothing of it can be visible in the 66th degree of latitude, and it would not cover anything of the Tropic of Cancer at all (so as to intercept from it the light of the sun). And if for those

latitudes (66° and 23°) Meru is under the horizon, it is also under the horizon for all places of less latitude. If you compare Meru with a luminous body like the sun, you know that the sun sets and disappears under the earth. Indeed Meru may be compared with the earth.

Page 123. It is not invisible to us because of its being far away in the cold zone, but because it lies below the horizon, because the earth is a globe, and everything heavy is attracted towards its centre.

Âryabhaṭa further tries to prove that Mount Meru has only a moderate height by the fact that the Tropic of Cancer is visible in places the latitude of which is equal to the complement of the greatest declination. We must remark that this argument is not valid, for we know the conditions of the lines of latitude and other lines in those countries only through ratiocination, not from eyesight nor from tradition, because they are uninhabited and their roads are impassable.

If a man has come from those parts to Âryabhaṭa and told him that the Tropic of Cancer is visible in that latitude, we may meet this by stating that a man has also come to *us* from the same region telling us that one part of it is there invisible. The only thing which covers the Tropic of Cancer is this mountain Meru. If Meru did not exist, the whole tropic would be visible. Who, now, has been able to make out which of the two reports deserves most credit?

In the book of Âryabhaṭa of Kusumapura we read that the mountain Meru is in Himavant, the cold zone, not higher than a *yojana*. In the translation, however, it has been rendered so as to express that it is not higher than Himavant by more than a *yojana*.

This author is not identical with the elder Âryabhaṭa, but he belongs to his followers, for he quotes him and follows his example. I do not know which of these two namesakes is meant by Balabhadra.

In general, what we know of the conditions of the

place of this mountain we know only by ratiocination. About the mountain itself they have many traditions. Some give it the height of one *yojana*, others more; some consider it as quadrangular, others as an octagon. We shall now lay before the reader what the Ṛishis teach regarding this mountain.

Matsya-Purâṇa on Mount Meru and the mountains of the earth.

The *Matsya-Purâṇa* says: "It is golden and shining like fire which is not dulled by smoke. It has four different colours on its four sides. The colour of the eastern side is white like the colour of the Brahmins, that of the northern is red like that of the Kshatriya, that of the southern is yellow like the colour of the Vaiśya, and that of the western is black like the colour of the Śûdra. It is 86,000 *yojana* high, and 16,000 of these *yojana* lie within the earth. Each of its four sides has 34,000 *yojana*. There are rivers of sweet water running in it, and beautiful golden houses inhabited by the spiritual beings, the Deva, by their singers the Gandharva, and their harlots the Apsaras. Also Asuras, Daityas, and Râkshasas are living in it. Round the mountain lies the pond Mânasa, and around it to all four sides are the *Lokapâla*, *i.e.* the guardians of the world and its inhabitants. Mount Meru has seven *knots*, *i.e.* great mountains, the names of which are Mahendra, Malaya, Sahya, Śuktibâm (?), Ṛikshabâm (?), Vindhya, Pâriyâtra. The small mountains are nearly innumerable; they are those which are inhabited by mankind.

"The great mountains round Meru are the following: *Himavant*, always covered with snow, inhabited by the Râkshasa, Piśâca, and Yaksha. *Hemakûṭa*, the golden, inhabited by the Gandharva and Apsaras. *Nishadha*, inhabited by the Nâga or snakes, which have the following seven princes: Ananta, Vâsuki, Takshaka, Karkoṭaka, Mahâpadma, Kambala, Aśvatara. *Nîla*, peacock-like, of many colours, inhabited by the Siddha and Brahmarshi, the anchorites. The mountain Page 124.

Śveta, inhabited by the Daitya and Dânava. The mountain *Śriṅgavant*, inhabited by the Pitaras, the fathers and grandfathers of the Deva. Not far to the north of this mountain there are mountain-passes full of jewels and of trees which remain during a whole kalpa. And in the centre of these mountains is Ilâvṛita, the highest of all. The whole is called *Purushaparvata*. The region between the Himavant and the Śriṅgavant is called Kailâsa, the play-ground of the Râkshasa and Apsaras."

Quotations from the *Vishṇu*, *Vâyu*, and *Âditya Purâṇas*.

The *Vishṇu-Purâṇa* says: "The great mountains of the middle earth are Śrî-parvata, Malaya-parvata, Mâlyavant, Vindhya, Trikûṭa, Tripurântika, and Kailâsa. Their inhabitants drink the water of the rivers, and live in eternal bliss."

The *Vâyu-Purâṇa* contains similar statements about the four sides and the height of Meru as the hitherto quoted Purâṇas. Besides, it says that on each side of it there is a quadrangular mountain, in the east the Mâlyavant, in the north Ânîla, in the west the Gandhamâdana, and in the south the Nishadha.

The *Âditya-Purâṇa* gives the same statement about the size of each of its four sides which we have quoted from the *Matsya-Purâṇa*, but I have not found in it a statement about the height of Meru. According to this Purâṇa, its east side is of gold, the west of silver, the south of rubies, the north of different jewels.

The commentator of Patañjali on the same subject.

The extravagant notions of the dimensions of Meru would be impossible if they had not the same extravagant notions regarding the earth, and if there is no limit fixed to guesswork, guesswork may without any hindrance develop into lying. For instance, the commentator of the book of Patañjali not only makes Meru quadrangular, but even oblong. The length of one side he fixes at 15 *koṭi*, *i.e.* 150,000,000 *yojana*, whilst he fixes the length of the other three sides only at the third of this, *i.e.* 5 *koṭi*. Regarding the four sides of

Meru, he says that on the east are the mountain Mâlava and the ocean, and between them the kingdoms called Bhadrâśva. On the north are Nîla, Sîta, Śriṅgâdri, and the ocean, and between them the kingdoms Ramyaka, Hiraṇmaya, and Kuru. On the west are the mountain Gandhamâdana and the ocean, and between them the kingdom Ketumâla. On the south are Mrâvarta (?), Nishadha, Hemakûṭa, Himagiri, and the ocean, and between them the kingdoms Bhâratavârsha, Kiṁpurusha, and Harivarsha.

Buddhistic views.

This is all I could find of Hindu traditions regarding Meru; and as I have never found a Buddhistic book, and never knew a Buddhist from whom I might have learned their theories on this subject, all I relate of them I can only relate on the authority of Alêrânshahrî, though, according to my mind, his report has no claim to scientific exactness, nor is it the report of a man who has a scientific knowledge of the subject. According to him, the Buddhists believe that Meru lies between four worlds in the four cardinal directions; that it is square at the bottom and round at the top; that it has the length of 80,000 *yojana*, one half of which rises into heaven, whilst the other half goes down into the earth. That side which is next to our world consists of blue sapphires, which is the reason why heaven appears to us blue; the other sides are of rubies, yellow and white gems. Thus Meru is the centre of the earth.

The mountain *Ḳâf*, as it is called by our common people, is with the Hindus the Lokâloka. They maintain that the sun revolves from Lokâloka towards Meru, and that he illuminates only its inner northern side.

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A tradition of the Zoroastrians of Sogdiana.

Similar views are held by the Zoroastrians of Sogdiana, viz. that the mountain Ardiyâ surrounds the world; that outside of it is *khôm*, similar to the pupil of the eye, in which there is something of everything, and that behind it there is a *vacuum*. In the centre of the

world is the mountain *Girnagar*, between our κλίμα and the six other κλίματα, the throne of heaven. Between each two there is burning sand, on which no foot could stand. The spheres revolve in the *climata* like *mills*, but in ours they revolve in an inclined course, because our *clima*, that one inhabited by mankind, is the uppermost.