

THE  
DAWN OF ASTRONOMY.

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CHAPTER I.

THE WORSHIP OF THE SUN AND THE DAWN.

WHEN we inquire among which early peoples we are likely to find the first cultivation of astronomy, whatever the form it may have taken, we learn that it is generally agreed by archæologists that the first civilisations which have so far been traced were those in the Nile Valley and in the adjacent countries in Western Asia.

The information which we possess concerning these countries has been obtained from the remains of their cities, of their temples—even, in the case of Babylonia, of their observatories and of the records of their observations. Of history on papyrus we have relatively little.

Not so early as these, but of an antiquity which is still undefined, are two other civilisations with which we became familiar before the treasure-houses of Egypt and Babylonia were open to our inquiries. These civilisations occupied the regions now called India and China.

The circumstances of these two groups are vastly dissimilar so far as the actual sources of information are concerned; for in relation to China and India we have paper records, but, alas! no monuments of undoubtedly high antiquity. It is true

that there are many temples in India in the present day, but, on the authority of Prof. Max Müller, they are relatively modern.

The contrary happens in Egypt, for there monuments exist more ancient than any of the inscribed records; monuments indicating a more or less settled civilisation; a knowledge of astronomy, and temples erected on astronomical principles for the purposes of worship, the astronomers being called "the mystery teachers of Heaven."

We go back in Egypt for a period, as estimated by various authors, of something like 6,000 or 7,000 years. In Babylonia inscribed tablets carry us into the dim past for a period of certainly 5,000 years; but the so-called "omen" tablets indicate that observations of eclipses and other astronomical phenomena had been made for some thousands of years before this period. In China and in India we go back as certainly to more than 4,000 years ago.

When one comes to examine the texts, whether written on paper or papyrus, burnt in brick, or cut on stone, which archaeologists have obtained from all these sources, we at once realise that man's earliest observations of the heavenly bodies in all the regions we have named may very fairly be divided into three perfectly distinct stages. I do not mean to say that these stages follow each other exactly, but that at one period one stage was more developed than another, and so on.

For instance, in the first stage, wonder and worship were the prevalent features; in the second, there was the need of applying the observation of celestial phenomena in two directions, one the direction of utility—such as the formation of a calendar and the foundation of years and months; and the other the astrological direction.

Supplied as we moderns are with the results of astronomical observation in the shape of almanacs, pocket-books,

and the like, it is always difficult, and for most people quite impossible, to put ourselves in the place and realise the conditions of a race emerging into civilisation, and having to face the needs of the struggle for existence in a community which, in the nature of the case, must have been agricultural. Those would best succeed who best knew when "to plow and sow, and reap and mow;" and the only means of knowledge was at first the observation of the heavenly bodies. It was this, and not the accident of the possession of an extended plain, which drove early man to be astronomically minded.

The worship stage would, of course, continue, and the priests would see to its being properly developed; and the astrological direction of thought, to which I have referred, would gradually be connected with it, probably in the interest of a class neither priestly nor agricultural.

Only more recently—not at all, apparently, in the early stage—were any observations made of any celestial object for the mere purpose of getting knowledge. We know from the recent discoveries of Strassmaier and Epping that this stage was reached at Babylon at least 300 years B.C., at which time regular calculations were made of the future positions of moon and planets, and of such extreme accuracy that they could have been at once utilised for practical purposes. It looks as if rough determinations of star places were made at about the same time in Egypt and Babylonia.

This abstract inquiry is now practically the only source of interest in astronomy to us; we no longer worship the sun; we no longer believe in astrology; we have our calendar; but we must have a Nautical Almanac calculated years beforehand, and some of us like to know a little about the universe which surrounds us.

It is very curious and interesting to know that the first

stage, the stage of worship, is practically missing in the Chinese annals; the very earliest Chinese observations show us the Chinese, a thoroughly practical people, trying to get as much out of the stars as they could for their terrestrial purposes.

In Babylonia it is a very remarkable thing that from the beginning of things—so far as we can judge from the records—the sign for God was a star.

We find the same idea in Egypt: in some of the hieroglyphic texts three stars represented the plural “gods.”

I have already remarked that the ideas of the early Indian civilisation, crystallised in their sacred books called Vedas, were known to us long before either the Egyptian or the Babylonian and Assyrian records had been deciphered.

Enough, however, is now known to show that we may take the Vedas to bring before us the remnants of the first ideas which dawned upon the minds of the earliest dwellers in Western Asia—that is, the territory comprised between the Mediterranean, the Black Sea, the Caucasus, the Caspian Sea, the Indus, and the waters which bound the southern coasts—say, as far as Cape Comorin. Of these populations, the Egyptians and Babylonians may be reckoned as the first. According to Lenormant—and he is followed by all the best scholars—this region was invaded in the earliest times by peoples coming from the steppes of Northern Asia. Bit by bit they spread to the west and east. There are strange variants in the ideas of the Chaldæans already recovered from the inscriptions and those preserved in the Vedas. Nevertheless, we find a sun-god<sup>1</sup> and the following hymn:—

“Oh Sun, in the most profound heaven thou shinest. Thou openest the locks which close the high heavens. Thou openest the door of heaven. Oh

<sup>1</sup> Maspero, “*Histoire ancienne des Peuples de l'Orient*,” p. 136.

Sun, towards the surface of the earth thou turnest thy face. Oh Sun, thou spreadest above the surface, like a mantle, the splendour of heaven.”

Let us consider for a moment what were the first conditions under which the stars and the sun would be observed. There was no knowledge, but we can very well understand that there was much awe, and fear, and wonder. Man then possessed no instruments, and the eyes and the minds of the early observers were absolutely untrained. Further, night to them seemed almost death—no man could work; for them there was no electric light, to say nothing of candles; so that in the absence of the moon the night reigned like death over every land. There is no necessity for us to go far into this matter by trying to put ourselves into the places of these early peoples; we have only to look at the records: they speak very clearly for themselves.

But the Vedas speak fully, while as yet information on this special point is relatively sparse from the other regions. It is wise, therefore, to begin with India, whence the first complete revelations of this kind came. Max Müller and others during recent years have brought before us an immense amount of most interesting information, of the highest importance for our present subject.

They tell us that 1,500 years B.C. there was a ritual, a set of hymns called the Veda (*Veda* meaning “knowledge”). These hymns were written in Sanskrit, which a few years ago was almost an unknown language; we know now that it turns out to be the nearest relation to our English tongue. The thoughts and feelings expressed in these early hymns contain the first roots and germs of that intellectual growth which connects our own generation with the ancestors of the Aryan races—“those very people who, as we now learn from the Vedas, at the rising and the setting of the sun, listened with

trembling hearts to the sacred songs chanted by their priests. The Veda, in fact, is the oldest book in which we can study the first beginnings of our language and of everything which is embodied in all the languages under the sun." The oldest, most primitive, most simple form of Aryan Nature-worship finds expression in this wonderful hymnal, which doubtless brings before us the rituals of the ancient Aryan populations, represented also by the Medes and Persians.

There was, however, another branch, represented by the Zend-Avesta, as opposed to the Vedas, among which there was a more or less conscious opposition to the gods of Nature, to which we are about to refer, and a striving after a more spiritual deity, proclaimed by Zoroaster under the name of Ahura-Mazda, or Ormuzd. The existence of these rituals side by side in time tends to throw back the origin of the Nature-worship of both. Now, what do we find? In the Veda the gods are called Devas, a word which means "bright"; brightness or light being one of the most general attributes shared by the various manifestations of the deity. What were the deities? The sun, the sky, the dawn, fire, and storm. It is clear, in fact, from the Vedas that sunrise was, to those from whom the ritual had been derived, the great revelation of Nature, and in time, in the minds of the poets of the Veda, *deva*, from meaning "bright," gradually came to mean "divine." Sunrise it was that inspired the first prayers of our race, and called forth the first sacrificial flames. Here, for instance, is an extract from one of the Vedas. "Will the sun rise again? Will our old friend the Dawn come back again? Will the power of Darkness be conquered by the God of Light?"

These three questions in one hymn will show what a questionable stage in man's history is thus brought before us, and how the antithesis between night and day was one of

the first things to strike mankind. We find very many names for Sun-gods—

Mitra, Indra (the day brought by the sun),  
Sûrya, Vasishtha, Arusha (bright or red);

and for the Dawn-gods—

Ushas, Dyaus, Dyotanâ,  
Ahanâ, Urvasî.

We have only to consider how tremendously important must have been the coming of the sun in the morning, bringing everything with it; and the dying away of the sun in the evening, followed at once by semi-tropical quick darkness, to cease to wonder at such worship as this. Here is an extract from one hymn to the Dawn (Ushas):—

“(1) She shines upon us like a young wife, rousing every living being to go to his work; when the fire had to be kindled by men she made the light by striking down darkness.

“(2) She rose up spreading far and wide, and moving everywhere, she grew in brightness, wearing her brilliant garment [the mother of the cows (the mornings)], the leader of the days, she shone gold-coloured, lovely to behold.

“(3) She, the fortunate, who brings the eye of the gods, who leads the white and lovely steed (of the sun), the *Dawn*, was seen revealed by her rays, with brilliant treasures, following everyone.

“(4) Thou art a blessing when thou art near . . . Raise up wealth to the worshipper, thou mighty *Dawn*.

“(5) Shine for us with thy best rays, thou bright Dawn. . . .

“(6) Thou daughter of the sky, thou high-born Dawn. . . .”

In addition to the Sun and the Dawn, which turn out to be the two great deities in the early Indian Pantheon, other gods are to be met with, such as Prithivî, the Earth on which we dwell; Varuna, the Sky; Ap, the Waters; Agni, the Fire; and Maruts, the Storm-gods. Of these, Varuna is especially interesting to us. We read:—

“Varuna stemmed asunder the wide firmament; he lifted up on high the bright and glorious heaven; he stretched out apart the starry sky and the earth.”

Again—

“This earth, too, belongs to Varuna, the king, and this wide sky with its ends far apart. The two seas (the sky and the ocean) are Varuna’s loins.”

Finally, the result of all this astral worship was to give an idea of the connection between the earth and the sun and the heavens, which are illustrated in later Indian pictures, bringing before us modernised and much more concrete views of these early notions, ultimately transformed into this piece of poetic thought, that the earth was a shell supported by elephants (which represent strength), the elephants being supported on a tortoise (which represents infinite slowness).

This poetical view subsequently gave way to one less poetical—namely, that the earth was supported by pillars; on what the pillars rested is not stated, and it does not matter. We must not consider this as ridiculous, and pardonable merely because it is so early in point of time; because, coming to the time of Greek civilisation, Anaximander told us that the earth was cylindrical in shape, and every place that was then known was situated on the flat end of the cylinder; and Plato, on the ground that the cube was the most perfect geometrical figure, imagined the earth to be a cube, the part of the earth known to the Greeks being on the upper surface. In these matters, indeed, the vaunted Greek mind was little in advance of the predecessors of the Vedic priests.