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THE CALENDARS.

From the most casual glance at a planisphere or celestial globe one is led to associate the noble and sublime science of astronomy with shepherd life. In the pastures of the newly-created world the first human beings have very little society, and all they saw from day to day was their flocks grazing and frisking about them. There were several signs, however, by means of which, if they were only observant, they could have roughly calculated the flight of time. Thus the departure of the birds in the autumn and the fall of the leaves warned them of the approach of winter, and fixed an epoch recurring with periodic regularity. But in their wanderings in search of new pastures, the necessity of an unerring guide became of paramount importance, and naturally the heavenly bodies came to be adopted as a great compass or wondrous directing and date-marking machine, fixing the regular periodic flow of time. Thus the heliacal rising of one certain star heralded the advent of the shearing season, while the appearance of the Pleiades in the east preluded the seedtime; and thus two dates of the utmost importance to a primitive and pastoral people came to be fixed. And as in this simple astronomy the shepherds traced the annals of the stars among their flocks and herds, so in like manner they traced the history of their flocks among the stars.

Thus the course of the sun came to lie amid sheepfolds and their surroundings. At one time of the year the zodiacal constellation Taurus, the bull, the lord of the herd, marked where 'the father of day' was located. At another time the ram, the master of the fold, served to designate his position.

The lion, the terror of herdsmen, was also placed in the sky; together with the dreaded scorpion; and besides these concomitants of the life of a shepherd, he placed above him still dearer associations, such as the children of his household, Gemini; the virgin, Virgo; the ear of corn, Spica Virginis; and his instruments of husbandry the Plough and the Sickle.

The best possible proof of how far the stars had entered into the life of man may be found in the worship of the Sabæans of antiquity, who adored the starry hosts as infinite God. But

this epoch of mystery evidently preceded the dawn of observation, and the most important period in connection with the subject of time-measuring commenced when men began to turn the celestial sphere into a mighty rustic habitation, modeled on the basis of their own immediate surroundings.

Even the dog, the type of watchfulness, was translated to the heavens; the bright star Sirius, whose heliacal rising in the days of ancient Egypt presaged the overflowing of the Nile, a periodic event of the greatest national importance.

Thus from the earliest times the heavenly bodies in their seasons have been regarded as grand time-measures; but long before the stars had been observed for astrological or other purposes, the sun and moon, more intimately connected with man's existence, came to be regarded as time marking machines; and it is on the motions of these two celestial bodies that all calendars have been based.

It would be reasonably expected that the sun, which is the great source and supporter of life upon the earth, and the regulator of the seasons, would be generally adopted as a measurer of time; but men were also struck by the constant and regular return of the phases of the moon, and from this fact they were led to use the moon as the basis for their calendar.

The Mussulman year is purely lunar, and consists of the period embraced by twelve revolutions of the moon around the earth, or three hundred and fifty-four and one-third days. The Israelites never adopted the solar year, not even when they lived so long in the land of Egypt, for we find them, so soon as they were settled in the Promised Land, using the lunar month and the lunar year. The ancient Jewish year had only three hundred and fifty-four days, twelve days were added sometimes at the end of the year, and sometimes a month of thirty days after the month Adar, in order to bring it into agreement with the solar year. But the Jewish calendar received a reform in the fourth century after the Christian era, and it is this improved calendar which is used by the Jews of our day for fixing their festivals and religious ceremonies. It is extremely ingenious, and is based on the course of the moon. The year is composed of twelve lunar months when common, and of thirteen

lunar months when embolismic; and these years succeed each other in such a way that after a period of nineteen years the commencement of the Jewish year arrives at the same epoch as the solar year. The Jewish year is therefore a lunar-solar year; and the civil year of this remarkable people, in common with all oriental nations, commences with the new moon of September, and the ecclesiastical year of the new moon in March.

The Egyptians, who reached a high state of civilization in the dim twilight of remote antiquity, calculated the year as consisting of three hundred and sixty days, or twelve months of thirty days. In the pursuit of astrology—that vain attempt to evolve the secret of the supposed mystic connection between the celestial bodies and the destiny of man—the Egyptians were unconsciously laying the groundwork of the sublime science of astronomy; and, in a period of continued observation they found that the year of three hundred and sixty days fell short of a true solar year by five days. This new year came into force and commenced on the 26th of February, 747 B. C., and this day was the beginning of the era of Nabonassar. The year of three hundred and sixty-five days was followed for a period of seven hundred and twenty-three years; but in the year 25 B. C. a supplementary day was added every four years, and this year of three hundred and sixty-five and one-fourth days became a fixed year, and was adopted by the Romans when they conquered Egypt. This year was also adopted by the Copts, and the first year of the era of the martyrs commenced on the 29th of August, 284 A. D.

The Greeks, the most cultured of the nations of antiquity, were rather slow to turn their powers of observation to the sky. They employed at first—borrowing from the Egyptians and the Babylonians—the year of three hundred and sixty-five days, divided into twelve months of thirty days. Each month consisted of three decades; and this is the sole example in ancient history of a week of ten days. Meton of Athens, in 432 B. C., having observed the summer solstice, found that a period of nineteen solar years contained two hundred and thirty-five lunations exactly, and that at the end of this period the sun and the moon returned to the same point in the heavens. This discovery was