

### The Cult of the Sun.

AT a meeting of the Royal Anthropological Institute on Nov. 5, Mrs. Zelia Nuttall read a paper on "The Cult of the Sun at the Zenith in Ancient America".

Attention was first directed to the important fact that all the ancient centres of civilisation in America are situated within the tropical zone. In this the sun passes through the zenith of each latitude twice a year at noon, excepting at the tropical lines, which it approaches very slowly, and passes through the zenith at noon for 10 or 12 consecutive days at the solstices, appearing to linger there before slowly moving away.

When the sun passes the zenith, vertical objects, of course, cast no shadow. The high temperature caused by the vertical rays over a particular area causes an indraught producing an ascending current carrying up the warm moist air which, condensed in the higher regions of the atmosphere, falls as rain. It is a law of Nature that, subject to modifications according to situation near sea or mountain ranges, the rainy season of any place begins almost, if not immediately, after the sun has reached its zenith.

Authentic, documentary, and historical evidence presented establishes that throughout tropical America this phenomenon was observed by means of gnomons ranging from staffs, high poles, plain or carved columns and stelæ, conical structures and altars, and finally temples situated on high sub-structures. The ancient sun priests dated the commencement of the year from the moment the gnomon cast no shadow, and the phenomenon was interpreted as a 'descent' of the sun, to which prayers were addressed for rain which, of course, were effective.

A number of peculiar structures with vertical shafts have been found in temples, and also below ground, and it is obvious that such would have afforded a perfect means of registering not only the sun at the zenith, when its rays would fall into the chamber,

but also the culmination of the moon and other celestial bodies, in particular of the Pleiades in November, which heralded the dry season and gave the signal for the lighting of the bonfires which were kept burning day and night in the temple courtyards for public convenience during the dry and cold season.

The native representations in painting and sculpture show the sun god descending head-foremost in human form, or as a bird or a combination of both, associated with the serpent, the symbol of rain. A head in a solar disc or a winged head were also employed as symbols, and the sun god armed, seated in the centre of a solar disc, is another common form.

Mention was made of the interesting fact that, at Mrs. Nuttall's suggestion, the observation of the shadowless pole has been officially revived as a school festival in Mexico as an educational factor and a link with the past. This year, for the first time since 1519, it was celebrated in a public square, witnessed by thousands of school children, some of whom danced and sang in the Aztec language in native costume to the accompaniment of drums and flutes of ancient form.

In conclusion, it was pointed out that the northernmost great ruins in Mexico, those of the Guinada in the State of Zacatecas, are situated on the Tropic of Cancer, where the sun would appear to make a prolonged annual visit, and that in precisely the same latitude in Africa lie the ruins of Kalahshu, and not far to the south of Der, the ancient name of which was "the city of the sun". The ruins of Zimbabwe are within three degrees of latitude to the north of the Tropic of Capricorn, and their conical structure and a chamber with a vertical shaft appear to testify that in the Old, as in the New World, the inhabitants of the intertropical region observed and celebrated the passage of the sun through the zenith which was followed by rain.

### The Storage of Food.

THE Report of the Food Investigation Board for 1928<sup>1</sup> again reveals the wide scope of the researches on the preservation and storage of food carried out under its auspices. During the year, Sir William Hardy retired from the chairmanship and was succeeded by Sir Joseph Broodbank; and Dr. F. F. Blackman and Dr. J. B. Orr succeeded Sir Richard Threlfall and the late Prof. T. B. Wood as members. The extension of the Low Temperature Research Station at Cambridge was well advanced at the end of the year, and the new fruit storage research station at East Malling had been commenced: it was also decided to set up a fish research station at Aberdeen. On the other hand, work on fish by-products was discontinued.

#### CONDITIONING OF BEEF.

An important research on the changes undergone by beef during storage and its effects upon the palatability and flavour of the meat has been carried out by T. Moran and E. C. Smith and published as a special report to the Board.<sup>2</sup> The following general procedure is recommended: after killing, the carcase

should be carefully dressed and cooled for 1-2 days at 31°-33° F.; the meat is then hung as sides or quarters at 36°-38° F. for 10-12 days and finally stored for the 24 hours before sale at room temperature or at 40°-45° F. It is also necessary to rest the animal before slaughter if good quality meat is to be obtained.

The first change after death is the onset of rigor mortis, which consists of a gelation of the muscle plasma, causing hardening and loss of irritability, and a production of acid which causes contraction of the muscle, increase in opacity, and later the breakdown of the protein gel. In experiments on the rate of cooling of carcasses, it was found that the temperature in the muscles increased for the first few hours after death, partly due to the conversion of glycogen into lactic acid and partly due to the changes in the physical state of the proteins. The later stage of resolution of rigor is relatively slow: it is brought about by autolysis, by the acidity of the tissues, and by bacterial action, and can be controlled to a considerable extent by the conditions of storage.

In following the changes in detail, it is necessary to consider separately each tissue of which the meat is composed. The state of the superficial connective tissue is largely responsible for the appearance of the meat: it readily takes up 80-100 per cent of its weight of water, and becomes white and opaque; this may occur from excessive swabbing on cleaning the carcase or from sweating on removal from cold store. On

<sup>1</sup> Department of Scientific and Industrial Research. Report of the Food Investigation Board for the year 1928. Pp. vi+110. (London: H.M. Stationery Office, 1929.) 3s. 6d. net.

<sup>2</sup> Department of Scientific and Industrial Research: Food Investigation. Special Report No. 36: Post-mortem Changes in Animal Tissues—The Conditioning or Ripening of Beef. By T. Moran and E. C. Smith. Pp. vii+64+8 plates. (London: H.M. Stationery Office, 1929.) 2s. net.