

ARCHAEOLOGY

American Pyramids Served as Timepieces, Survey Shows

Structures Are Found Uniformly Askew From Compass Directions Just Enough to Face Setting Sun at Equinoxes

PROOF that Indians in Mexico built pyramids to serve as astronomical timepieces has been secured by a Mexican government archaeologist, Sr. Ignacio Marquina.

Thus the ancient pyramids of America are awarded astronomical significance which researchers have sought vainly in the Egyptian pyramids. Egypt's pyramids are tombs but not timepieces, Egyptologists almost universally admit. Mexico's pyramids, on the other hand, are pedestals for high temples, and some at least are oriented to mark the passing of the sun and certain stars.

Sr. Marquina has demonstrated that the carved pyramid of Tenayuca, built by Aztec Indians, was a sun-dial which accurately marked the moment when the New Year began. The Mexican New Year was July 26.

Sr. Marquina's attention was drawn toward possible relationship of sun and pyramids when he surveyed the archaeological sites of Mexico. He noticed that the angle at which principal pyramid-temples faced was apt to be followed by all monuments and buildings of a city.

He also observed two ideas in orientation. In southern Mexico and Guatemala and southern Yucatan, the buildings generally were square to the four world directions, and facing astronomical west, exactly between the two points where the sun sets in the summer and winter solstices.

True of Toltec Culture

But farther north, in places allied with Toltec Indian culture, he found the main pyramids skewed a little from facing west. They faced slightly northward, the angle of deviation varying with the latitude of the city. This was the case at such widely scattered cities as Chichen Itza, Uxmal, Teotihuacan, Tenayuca and Cholula.

At Tenayuca, Sr. Marquina made tests to see whether this constant arrangement at cities so far apart obeyed some astronomical rule. He measured the angle which the setting sun makes with

the center of Tenayuca's pyramid. He measured it for summer and winter solstices, the spring and autumn equinoxes, and the two times in the year when the sun passes overhead.

It was strikingly demonstrated that the building looks directly into the setting sun on May 16 and July 26 of every year. Those are the two days when the sun crosses overhead in the zenith. On those days there is a moment when an upright object casts no shadow because the sun is directly above it. This sign, so easily observed, is the simplest way of marking the passing of a year.

Stars Tested

From proving relationship with the sun, Sr. Marquina proceeded to test lines certain stars made with the Tenayuca pyramid.

He found that the stars important to

Mexican Indians in their religion were stars whose lines of sight coincided with the sun lines on the solstices, the equinoxes, and the sun's zenith. It appears that those stars were important because they did coincide.

The leading star was Aldebaran, which was on the line of sight of the setting sun on the two days when the sun crossed the zenith. Thus the ancient architects could use Aldebaran to guide them in setting their pyramids at the right angle, and they did not have to wait for the two days in the year when the sun would mark the spot.

Lord of the Night

In Aztec lore, Aldebaran was called Lord of the Night, and he belonged to the constellation of the new fire. In all the Aztec empire new fires were made on New Year's Day by rubbing together sticks shaped like that constellation.

Mexican archaeologists now believe that the Tenayuca pyramid was rebuilt seven times, like an ever-growing nest of boxes, not because the Indians wanted to repair it or make it bigger, but for ceremonial reasons. It is possible, they say, that the re-building times marked beginnings of the 52-year "centuries" of the Indians when everything old had to be destroyed or made new.

Science News Letter, June 17, 1933

GENERAL SCIENCE

Galaxy of Foreign Scientists Invade Century of Progress

A GALAXY of foreign scientists, over a sixth of them Nobel prize winners, will be guests of Chicago's Century of Progress exposition and the American Association for the Advancement of Science from June 19 to July 1 when thousands of scientists and engineers will gather to see the exposition and hold hundreds of meetings.

From the various intellectual centers of the world, 28 foreign scientists are on their way to Chicago as guests of America.

Five of them are Nobel prize winners and they are likely to meet during their stay at Chicago a number of America's five living Nobel prize winners in science.

The Nobelists among the foreign guests are: Dr. F. W. Aston of Cambridge, England, (chemistry 1922); Dr.

Niels Bohr, of Copenhagen, Denmark (physics 1922); Dr. A. V. Hill of London (medicine 1922); Dr. August Krogh of Copenhagen (medicine 1920); Dr. Theodor Svedberg of Upsala, Sweden (chemistry 1926).

The other foreign guests are: Dr. Otto Appel of Berlin, agriculture; Dr. G. A. Bagge of Stockholm, economics; Dr. Joseph Barcroft of Cambridge, physiology; Dr. A. Mendelssohn Bartholdy of Hamburg, political science; Dr. Jakob Bjerknes of Bergen, meteorology; Dr. Filippo Bottazzi of Naples, physiology; Dr. Ludwig Diels of Berlin, botany; Dr. Jean Dufrénoy of France, agriculture; Dr. Leopold Fejer of Budapest, mathematics; Dr. Enrico Fermi of Rome, physics; Dr. A. P. M. Fleming of Manchester, engineering; Dr. R. Goldschmidt of Berlin, zoology; Dr.