

Earth May Move When Moon Beckons

Astronomy

The axis of the earth may shift a little each day as the moon rises in the east, crosses the sky, and sets in the west. This may be the cause of a daily change in the latitude of a place on the earth that has just been discovered by Dr. Harlan T. Stetson, director of the Astronomical Laboratory at Harvard University, Cambridge. He was assisted in his work by Miss Margaret Olmsted, a graduate student at Radcliffe College.

What they discovered is a variation in latitude of any point on the earth's surface, dependent upon whether the moon is rising, setting, or in the middle of its passage across the sky. The variation is nearly ten times as great as any that can be explained on theoretical grounds.

"A slow progressive shift of the axis about which the earth rotates over a period of months and years has been known for a long time," explained Professor Stetson, "but that there shall exist a daily effect depending upon the position of the moon in

the sky was not known until the results of the present investigation were found. From the results of other investigations in progress at the Astronomical Laboratory we were led to believe that the moon might cause a deviation in the direction of gravity as it passed over the meridian of the observer.

"The most delicate test for a change in the direction of the vertical is to be found in the precise observations of stars for latitude. A photographic zenith telescope locates the position of the zenith with respect to the stars with the order of accuracy of about a hundredth of a second of arc, which corresponds to a foot on the earth's surface. The investigation was begun last spring of several thousands of such observations for latitude made some time ago at Gaithersburg, Md., one of the stations of the International Latitude Survey. It was the recent analysis of this series of observations that brought to light the variation of nearly a tenth

of a second of arc in latitude, depending upon the altitude of the moon. The maximum value occurs when the moon is 30 degrees about the horizon."

Thousands of observations for latitude of the Naval Observatory at Washington have been analyzed at the Harvard Laboratory and Professor Stetson announces these appear unmistakably to affirm the results of his previous study. The fact that this rise and fall of the value in latitude is gradual and systematic and represents a range nearly twenty times the value of the probable error leaves little room for doubt as to the reality of the variation. Several hypotheses are being considered to explain the phenomena which may be due to a combination of causes.

"Theoretically," says Professor Stetson, "a small tide must take place on the earth's crust as the moon revolves about the earth. But from other considerations we do not think that this can be (*Turn to next page*)

Was Disease Ruin of Maya?

Archaeology—Medicine

Whether disease or war or famine primarily caused the downfall of the great Maya empire has never been satisfactorily determined. Now an expedition of doctors and public health experts is setting out for Chichen Itza, famous capital city of this old American civilization, to find out, if possible, whether it was disease that ruined it and if so, what diseases in particular.

The expedition is from the department of tropical medicine of the Harvard Medical School and School of Public Health and the Carnegie Foundation of Washington. It is in charge of Dr. George C. Shattuck and includes Dr. Joseph C. Bequaert, entomologist; Dr. Jack H. Sandground, parasitologist; Dr. Kenneth Goodner, bacteriologist, and Byron L. Bennett, laboratory technician.

Nothing is now left of beautiful Chichen Itza but ruins. However, in some of the neighboring villages the population consists of practically pure-blooded Maya Indians. A study of the diseases that afflict these people now may throw light on the diseases that their ancestors suffered from. Such is the object and hope of the present expedition.

The case for disease as the destroyer of this famous old civilization, which collapsed (*Turn to next page*)

Astronomers on Way to Eclipse

Astronomy

Two groups of American astronomers are now on their way to Malaysia to observe the eclipse of May 9. Dr. John A. Miller and Mrs. Miller, from the Sproul Observatory of Swarthmore College, and Dr. Heber D. Curtis, of the Allegheny Observatory of the University of Pittsburgh, sailed from Genoa February 8 on a Dutch steamer, the *P. C. Hooft*, for Sumatra. Arriving at Belawan on February 27, they will spend a few days in Medan, the capital on the east coast, and then proceed by motor truck to Takeungeun, about 300 miles away in the mountains. There they will set up their large telescope and other equipment for the observations of the brief moments of the eclipse.

The other party is now sailing westward across the Pacific on the naval transport Chaumont. This is the expedition from the U. S. Naval Observatory, under the administrative charge of Commander C. H. J. Keppeler, U. S. N. Prof. William A. Cogshall, of the University of Indiana, is the scientific leader of the party. With him is Mrs. Cogshall, also an experienced eclipse observer, and Paul Sollenberger, astronomer of the Naval Observatory. Lieut. H. C. Kellers, of the Navy Medical Corps, is

with the party in the dual capacity of staff physician and also as a representative of the U. S. National Museum, for whom he will collect specimens of the flora and fauna of the countries visited.

The Naval Observatory party will set up its instruments at Iloilo, on the Island of Panay, with the cooperation of the Manila Observatory. Admiral Bristol, commander-in-chief of the Asiatic fleet, will furnish the expedition with the services of an expert motion-picture cameraman and the necessary mechanics and helpers.

This year's eclipse, which takes place during the afternoon of May ninth, is of exceptional importance on account of its long duration, the maximum duration of totality being over five minutes. Although wholly invisible in the United States, in fact, taking place in the dark hours of the eighth of May, the eclipse stretches its beam of darkness over widely separated land areas from the northwestern end of Sumatra, across the Malay State of Kedah, across Siam and Southern Cambodia, and finally over the middle group of islands of the Philippines between Luzon to the north and Mindanao to the south, including the im- (*Turn to next page*)

Moon Moves Earth—*Cont.*

sufficiently large to account for the observed effect. A tidal wave in the earth's atmosphere caused by the moon may alter the apparent direction of the ray of light from a star and produce some of the effect noted. The most direct interpretation is that of a shift in the earth's instantaneous axis of rotations. As a last resort it may be necessary to consider movement in the earth's crust.

"The importance, however, of the discovered effect need hardly be emphasized, as it is involved in the accurate determination of star positions from the minute changes of which much of the knowledge of our stellar motions depends. If the change in latitude here noted becomes substantiated by further researches it may appear necessary to apply new corrections to astronomical observation not hitherto recognized. Well-known discrepancies between the results for the positions of stars from widely separated observatories may yet be explained in part at least by this phenomenon."

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Astronomers on Way to Eclipse—*Continued*

portant cities of Iloilo, the second in size in the Philippines, and Cebu, where Magellan met his death in his round-the-world cruise.

"The Observatory's expedition", said Capt. C. S. Freeman, superintendent of the Naval Observatory. "in addition to special observations on its own part, is duplicating certain features of the program arranged for the party from the Sproul Observatory of Swarthmore College, which will go to Sumatra. An interesting comparison of data is in prospect if both parties are favored with clear weather. Several other expeditions are to cover the many phases of this exceptional eclipse. British expeditions from Greenwich and Cambridge are in prospect. Four German expeditions are planned, one from Hamburg possibly operating in the Philippines. Then there are Dutch, French, and Italian expeditions in preparation, and possibly one from Australia.

"The corona effects of this eclipse will not repeat themselves for another quarter of a century. It is therefore the corona that will receive intensive study this year. Besides a study of the Einstein problem, the various programs contemplate spectrophotometry of the chromosphere and corona both in the red and in the ultra-violet, a study of solar radiation near and

Metaphrenia

Psychiatry

A. STAERCKE in *International Journal Psycho-Analysis*, quoted in *Emergent Evolution and the Development of Societies* (Norton):

Civilization seems then to be a disease which is imposed on a certain portion of society in order to obtain a certain extra gain whereby all profit. . . Civilization from the individual point of view belongs to neurotic phenomena. . . We see the civilization of a people or a race built up in cycles according to the mechanisms of the obsessional neurosis, until it becomes no longer bearable; then there comes about a limitation of the useful effect through the return of the repressed material in disguised form, and a breaking through of forbidden things in war and revolution, according to the principles of the manic psychoses, while various "isms" analogous to the paranoid fields are not lacking. . . Civilization demands regression.

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through totality, experiments to test the effect of totality on radio transmission, relative intensities of the lines of the coronal spectrum, improved measurement of the wavelengths for the coronal lines with a spectograph of high dispersion, examination for displacement of the dark lines of the outer corona with a slit spectrograph of high dispersion, a study of coronal rotation with a falling plate spectrograph and an interferometer and with a quartz spectrograph, and other features, including a special study of the shadow-band phenomenon."

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The German government has invited teachers from Argentine to inspect the schools of Germany.

About 75,000 new patients are admitted to hospitals for mental diseases in this country each year.

A queer cargo recently shipped from New York City was 50 tons of live eels to be used in re-stocking the Baltic Sea.

A Field Museum expedition will explore remote regions of Brazil and Peru in search of new and rare plant specimens.

Snakebite Cures

Herpetology

KARL P. SCHMIDT, in *The Truth About Snake Stories* (Field Museum).

In North America the sovereign remedy for snake bite is whisky, prescribed in large doses. A more extraordinarily wrong procedure could not well be devised. Thorough-going experiments have shown that alcohol in small doses *increases* the rapidity with which snake poison is absorbed by the body, while in larger doses it very rapidly becomes an active aid to the snake poisoning, weakening the heart action when it most requires stimulation. . . .

The application of scientific research, beginning with the work of Pasteur, has developed the only real specifics against snake poison in the modern anti-venins. By their use, for example, the fatalities from snake poisoning in the Brazilian State of Sao Paulo have been reduced from the record of 155 in 1907 to two or three in 1924. Unfortunately it has been found that specific anti-venins must be prepared for each species, at least for each group of related species, of poisonous snakes; and this increases vastly the difficulties of treatment by this means. A North American anti-snake-bite serum has just been put on the market.

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Maya Disease—*Cont'd*

about the time of the Spanish conquest, is particularly good when one considers what a hotbed of disease Middle America has been, so far as our knowledge of it goes. The various fevers carried by parasites and insects may or may not have existed before the white man came to America. Of course, if they did, the Indians probably had acquired an immunity to them, in which case the downfall of the Mayas probably resulted from wars with other tribes.

Yellow fever and syphilis are now generally accepted as being of strictly American origin. On the other hand, smallpox, measles, malaria, hookworm, Asiatic cholera and trachoma, all of which have been very deadly for the red man, were introduced by the white man.

Whatever the cause, it is generally conceded that the Mayas were already greatly weakened before the Spaniards arrived. This accounts for their rapid downfall, the Spanish conquest.

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Between 1873 and May, 1928, there were 50 attempts to cross the Atlantic and Pacific Oceans by air.