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ANCIENT AND ACCURATE MAYA CALENDAR USED
ZERO SYMBOL CENTURIES BEFORE EUROPE KNEW IT.

(By Science Service)

Release, Wednesday, November 16.

Washington, November 15.— The Maya civilization, which reached its finest flower during the first five centuries of the Christian era in what is now the northern part of the Republic of Guatemala, had a system of chronology so exact that it differentiated any given day from every other within a period of more than 350,000 years, Dr. Sylvanus G. Morley, of the Carnegie Institution of Washington, said in an address here tonight.

"Nowhere else in the New World did the American Indian produce such an astonishing intellectual achievement," he said. "Here also was a numerical notation which had a symbol for zero before the Birth of Christ, five centuries before the Hindoos had invented a symbol for zero, and a thousand years before the use of zero came into Europe."

"This chronology, like the Julian Period, kept an exact account of the total number of elapsed days since its starting point, a hypothetical date (just like the starting point of the Julian Period) more than 3,000 B. C. And the current dates were expressed in totals of elapsed days written in the terms of a vigesimal numerical system, that is, increasing by a ratio of 20 instead of 10 as in our own."

"The relative ages of the ancient Maya cities therefore, are known more closely than the relative ages of the ancient cities of Egypt, Babylonia, Assyria or Chaldea, for example. And since the correlation of the Maya Calendar with the years of our own Christian Era has probably been effected to within a year, we may say that the absolute ages of these ancient Maya cities are better known than those of the ancient cities of the Old World."

"The principal contribution of the Maya chronological system to the study of the course of man's development in the New World is that, for one region at least, northern Central America and southern Mexico, it provides a standard cross-section of ancient American History covering a period of nearly 2,000 years from 100 B.C., to 1,700 A.D. As within the limits of this range the dates of the Maya monuments are rigidly fixed in the terms of a chronology which has had few equals anywhere at any time in the annals of the human race."

"It is confidently anticipated that by means of interlocking cultural horizons, the careful study of stratified deposits, refuse-heaps and the like, and the establishment of chronological sequence in ceramic types, the ordinary routine business of the archaeologist, that it will eventually be possible to correlate with Maya chronology the time element in all contiguous or associated cultures as far south as the great civilizations of Peru, and as far north as the Pueblo culture of our own southwest. In a word, it now seems probable that Maya chronology will provide the chronological yard-stick by means of which all associated ancient American cultures will eventually be dated."

(Editors: Dr. Kellogg was Mr. Hoover's right-hand man in the Belgium relief work during the war. He has just returned from a trip into starving Russia with the first American relief train.)

RUSSIAN PROFESSORS TREATED BETTER;
BUT LIVE BY SHOEMAKING OR SELLING FURNITURE

By Dr. Vernon Kellogg,
Permanent Secretary of the National Research Council
(Science Service)

For a long time after coming into power the Soviet Government of Russia maintained a seriously discouraging attitude toward the university faculties and the Russian professional and scientific men in general -- the "intelligentsia." But this attitude is now modified and still modifying. Along with the other changes in attitude and action characteristic of the recent months of Soviet Government, changes very marked in relation to business and general economic matters, changes have also been made in the way of ameliorating the situation of the university men.

The salaries, paid in paper roubles of constantly depreciating value -- they are now worth about 75,000 to the dollar! -- were very low, becoming, indeed, as the value of the rouble lowered, simply derisory. But more important, in Russia, the value of the rouble lowered, simply derisory. But more important, in Russia, than any salary paid in money -- unless it gets into millions of roubles a month -- is the "paik" (I spell it as pronounced) or food ration that is the essential part of the reward for services to the government. As is familiarly known the Soviet Government established several grades of rations according to various categories into which the people could be roughly divided. The working man got the largest or best ration; the university man nearly the lowest.

In my recent (September-October) visit to Russia as special representative of the American Relief Administration I learned something at first hand of the changing situation of the university and professional men of the country.

Samara is one of the several new universities set up by the Soviet Government. It has four faculties, medicine, law, agriculture, and "workers". The "Workers faculty" offers elementary classes for the sons and daughters of working men and peasants to fit them for matriculation in the professional departments of the university. The president of Samara University, himself a specialist (as he said) in the Italian Renaissance, intimated that his institution was meeting many difficulties, the principal one being that of finance--a difficulty not unknown outside of Soviet Russia. However, while we talked, students were going in and out of his office apparently on the usual errands connected with registration, and other matters.

The salaries and "paik" of the professors in the University of Kazan had been so meagre that not a man was able to live on them, and every professor was meeting his family's needs for food by doing something besides regular university work. The means for keeping himself and family alive were various, but almost in all cases they included the successive sacrificing of personal and household belongings. One professor of biology told me that he made shoes, and that his wife baked cakes and sold them in the city market. He had sold all of his own and wife's simple jewels and trinkets and one of his two microscopes. Yet this man who had not been able to see any books or papers published later than 1914 has struggled along with his special researches and has actually achieved two pieces of experimental work on vitamins which seem to me, with my little knowledge of the subject, to contribute certain definite new knowledge concerning these interesting substances.

But beginning in August, there had been a material increase in salary and in food ration. The monthly food ration had been put, in August, on the following basis: dark (mostly rye) flour, 30 lb.; dried peas, 5 lb.; cereal grits 15 lb.; sweets (not cane or beet sugar), 2½ lbs.; tobacco, ¾ lb.; butter, 6 lbs.; meat, 15 lbs.; fish, 5 lbs.; tea, ¼ lb.; white flour, 5 lbs. The items from dark flour to tobacco, inclusive, had been received, the rest of them, promised but not received. About 250 professors and instructors receive this ration. The university buildings are so cold that most of the men do all their work except lecturing in their homes. About 5000 students had registered but only about

10% of them were in actual attendance. The largest departments in point of student enrollment were medicine and science. My friend, the professor of biology, had never before ridden in an automobile until he rode with me in our relief car. About 20 men of the Kazan faculty have died in the last two years.

BABY RICKETS CURED
BY SUNLIGHT, DOCTOR ANNOUNCES
(By Science Service)
Release, Wednesday, November 16.

New York, November 15.- Rickets, the most common disorder of infants in the temperate zone, can be cured by sunlight, Dr. Alfred F. Hess of this city announced at the meeting of the American Public Health Association here this afternoon.

This disease has been attributed by most physicians to faulty diet and the prophylactic measures suggested previously have been mainly dietetic in nature. A few have always believed that hygienic factors play an important role in its cause.

"Rickets can be cured by merely putting the baby out in the sun perhaps a half hour a day so that it becomes well tanned," Dr. Hess says. "This is carried out gradually; first the legs, then the arms, and, finally the body is exposed. At all times the baby is kept warm and comfortable. After some weeks of such treatment, the general condition of the infant improves and the rickets, as shown by physical and x-ray examinations, rapidly diminishes or disappears. Chemical tests of the blood have also shown the definite cure which this simple hygienic therapy is able to accomplish. In order to exert this remarkable effect on the body, the sun must impinge its rays directly on the skin. They will confer but little benefit after they have traversed the glass windows of the room or the clothing of the infant. This loss of activity is due to the fact that the effective rays have very slight power of penetration, differing in this respect markedly from the heat rays of the sun."

"These results have been confirmed on animals. Rats can be cured of rickets in a similar way, or can be prevented from developing this disorder while on a diet, which, otherwise, would invariably bring it about."

"These results do not mean that diet plays no role in the development of rickets. They do indicate, however, that sunlight is an important element in the occurrence of this prevalent nutritional disorder. They show the necessity of considering sunlight in the construction of hospitals for children and child-caring institutions, and especially in connection with the housing of the poor in our large municipalities. Sunlight is not a mere luxury but a necessity; it is needed not only by growing plants but by growing animals as well. In the regime and treatment of the child it has been granted far too little consideration."

PENNY CANDY PLAYTHINGS COLLECT
DIRT AND MAKE CHILDREN ILL
(By Science Service)
Release Tuesday, November 15.

New York, November 14.- Shoe lace licorice, animal crackers, Christmas tree decorations of clear candy, and other forms of penny candies that children delight in and play with before eating, were held up for disapproval by Dr. Charles H. LaWall, dean of the Philadelphia College of Pharmacy and Science at the meeting of the American Public Health Association here this afternoon.

Confectionery of this sort is sometimes the cause of children's sickness. But many have suspected that it contains poisonous or irritating substances when the dirt and the germs that the candy is contaminated with while being handled by dirty hands are to blame, he said.

Dr. LaWall urged that the American Public Health Association go on record

as disapproving objectionable forms of candy playthings and take up the matter with the organized confectioners.

"There has been a great improvement in the main, in recent years in the character of many of the penny candies which are offered for sale to children," he declared. "Most of them are made of wholesome materials and an increasing number of them are appearing in wrapped individual pieces, thus minimizing the danger of contamination from handling or exposure before sale."

"Competition between rival manufacturers, however, has lead to types of candy which are made in the form of playthings. The fundamental idea is not a new one, for who does not remember Eugene Field's sugar plum tree where the gingerbread dog chased the chocolate cat through the branches."

Dr. LuWall said that the majority of the present objectionable forms are made of so-called licorice candy. Most of them contain little or no licorice, the color being due to a little lampblack and the flavor to oil of anise. Most persons, children and grown-ups, confuse anise and licorice flavors, because they are usually associated, so the manufacturer takes advantage of the fact and makes a black confection, flavors it with anise, and then often puts a warning note on the box; "These good contain no licorice", which is ignored by the seller who supplies them when licorice is asked for.

"The component parts of this so-called flexible licorice, which is now made up into so many forms, are sugar, glucose, starch or flour, flavor and lampblack, with sometimes a little licorice added to give warrant for the name," he said. "These ingredients in themselves are not indigestible nor harmful, but it is the manufacturers' evident intent to make something durable in the way of confectionery novelty, so he combines his ingredients to make a tough, flexible mass which can be drawn, rolled or moulded into any desired form and which is tough and resistant, hard to chew, slow to dissolve and represents the acme of indigestibility."

"Some of the objectionable forms in which this mass is then prepared for sale are as follows,- Long hollow tubes, like a section of rubber tubing, through which children suck up water or beverages or through which they blow their breath; long flexible solid strips, called by the manufacturers "shoe laces"; bead like strings of the material, called "neck-laces", often worn by children before eating them. The latest form that I have seen, and one concerning which definite complaints were made to the Philadelphia Health Department, by parents who stated that children had been made ill by them, is "pocketbooks". These resemble leather in texture and are made in the form of a small flat purse with a flap and a coin compartment, in which are placed several disc-like sugar wafers representing money."

CARNEGIE'S CRUISE CORRECTS CHARTS;
PACIFIC ISLAND WRONGLY CHARTED.

(By Science Service)

Washington, November 20.-- The latest ocean charts require corrections as the result of the magnetic data secured by scientists who accompanied the Carnegie Institution's non-magnetic brigantine "Carnegie" on its two-year cruise around the globe, which has just ended here.

Present charts of the Indian Ocean are in error one to two degrees in indicating the compass direction. These errors are sometimes to the east, sometimes to the west. Even larger ones exist on the charts of magnetic dip or inclination. During the "Carnegie's" earlier cruises in the Indian Ocean, errors were found ranging from one to seventeen degrees. The subsequent improvements in accuracy, which have been made in the magnetic data of all the ocean charts, can be ascribed principally to the "Carnegie's" work of the last twelve years, during which she has sailed over 300,000 miles. Now that the day of the wooden ship is past, the "Carnegie" is virtually the principal, if not the only, source of ocean magnetic data for the cartographer.

An incidental result of the last cruise was the discovery that Laysan

Island in the Pacific Ocean is charted 3.9 miles north and 1.4 miles east of its true position. The low visibility of this uninhabited island, especially at night, and the fact that the roar of the surf cannot be heard more than half a mile off shore, makes this chart correction especially important, in the estimation of Captain Ault of the "Carnegie".

The "Carnegie" is a floating observatory and laboratory, constructed of wood, bronze, copper, gun-metal, and other materials that will not affect the compass. She is a graceful sailing vessel of nearly 600 tons displacement, 155 feet long. Even the auxiliary gasoline engine of 120 h.p. is built almost entirely of non-magnetic bronze, while the four anchors, which are of manganese bronze, have eleven-inch hemp cables instead of the usual iron chains. This unique vessel carries about 13,000 square feet of canvas, and has sailed as much as 275 nautical miles per day. The most characteristic features of the vessel are the glass domes of the two observatories.

In addition to their principal work of determining the direction indicated by the compass on the oceans of the world, the scientists on board the "Carnegie" studied the variations in atmospheric electricity, recorded data on currents and other ocean phenomena, and made meteorological observations. Even the pitch and the roll of the vessel were automatically recorded. Such out-of-the-way bits of land as Penrhyn Island, Manihiki Island, and Fanning Islands were visited, and samples of their rocks were brought home for analysis in the Carnegie Institution's Geophysical Laboratory.

H. F. Johnston, A. Thomson, H. R. Grumann, R. R. Mills, R. Pemberton, and F. A. Franke, under command of Captain J. P. Ault, who is both sailor and scientist, make up the scientific staff of the "Carnegie", in addition to a crew of seventeen. Dr. L. A. Bauer, Director of the Department of Terrestrial Magnetism of the Carnegie Institution of Washington, accompanied this laboratory's floating observatory from the Panama Canal to Washington on the last passage of its cruise.

NEWS OF THE STARS

A Ruler 4,125,300,000,000,000 Miles Long.

By Isabel M. Lewis,
of the U. S. Naval Observatory
(Science Service)

An astronomical unit of measurement that is rapidly displacing the popular "light-year" is the "parsec" defined as the distance at which the parallax is one second of arc or, in other words, the distance at which the radius of the earth's orbit subtends an angle of one second of arc. The word is made up of the first syllables of "parallax" and "second" so its meaning is easily remembered.

One parsec is equal to 3.26 light years, ten parsecs to 32.6 light years and one hundred parsecs to 326 light years; so to change an astronomical distance expressed in parsecs to the same distance in light years one must multiply by 3.26. If the distance is expressed in light-years and we wish its equivalent in parsecs we divide by 3.26 or, for an approximate result, simply take three-tenths of the distance in light-years to find the distance in parsecs. For instance three thousand light years is equal roughly to nine hundred parsecs.

The parsec may also be defined as 206265 times the distance from the earth to the sun, which is nearly 20,000,000,000,000 miles. The number 206265 we recognize as the number of seconds in the arc of a circle that equals the radius in length.

When the parallax of a star is known we can find the distance of the star directly in parsecs by taking the reciprocal of the parallax or dividing it into unity. Thus, the parallax of Alpha Centauri is 0".75 and its distance expressed in parsecs is one divided by 0.75 or one and one-third parsecs.

The parsec is a more convenient unit than the light-year and is now used universally by astronomers in preference to the light-year.

PURCHASE DARWIN'S BIRTHPLACE

London, November 00 (Science Service).-- The British government has purchased the birthplace of Charles Darwin, propounder of the doctrine of evolution. This large, plain, square, red brick house was built in 1800, and is situated in Shrewsbury.

FIGHTING THREE PLAGUES IN BANGKOK

Bangkok, Siam, November 00 (Science Service).-- Far eastern customs continually hamper the fight against disease in Bangkok, but Dr. Ralph W. Mendelson, acting principal medical officer of the Royal Siamese Government, reports progress in controlling the three important epidemic diseases, plague, cholera, and smallpox. Lower classes in Bangkok obtain dirty water from the canals because it has the "body and taste" that clean city water has not, and this hampers cholera control. The people are also slow to submit to the doses of cholera vaccination necessary. Natives refuse to kill plague-carrying rats and even release them from traps because the Buddhist religion does not allow the killing of any animals. It is difficult to make their houses rat proof or to clear out rat food. In smallpox control, nearly 80,000 people are being vaccinated each year.

PEJIBAYE IS NEGLECTED TROPICAL FOOD PLANT

Washington, November 00 (Science Service).-- The neglected tropical American food plant, the pejibaye or chontaduro, is the rival of the famous oriental date palm, and like it, is capable, almost unaided, of supporting human life, Wilson Popehoe, agricultural explorer of the Department of Agriculture, declares. While Arab tribes utilize the date palm as their principal food, the aborigines of southern Costa Rica and other countries of northern South America subsist almost exclusively, during part of each year, upon pejibaye.

Sugar is the principal constituent of the date, while starch is the most important nutritive element in the pejibaye. Mr. Popehoe urges that the tree that produces this fruit be planted in dooryards in tropical countries and he predicts that this will be the first step toward the profitable commercialization of this fruit.

AMERICAN SURGEON IN CHILE

Santiago, Chile, November 00. (Science Service).-- Dr. William Sharpe, of Columbia University, New York, has been lecturing here on brain and nerve surgery, using motion picture films in illustration.

FROG-HOPPERS DAMAGE MEADOWS

New Haven, Conn. November 00 (Science Service).-- Entomologists at the Connecticut Agricultural Station here have been looking into the life history and actions of the grass-feeding frog-hopper or spittle-bug, an insect that sucks sap from grasses and uses it to form spittle balls, which protect it in one stage of its life. When grasshopper, leaf-hoppers, thrips and similar insects are common, these and the frog-hoppers often do considerable damage to meadows. Dr. Philip Gannan says that destroying its eggs by burning over land during fall, winter or early spring will control this pest.

MASTODON FOUND IN COSTA RICA

Washington, November 00 (Science Service).-- The remains of a mastodon were recently found near Cartago, Costa Rica, according to information received here.

(Editors: These paragraphs are designed to be used as a daily feature or they will provide a supply of handy features.)

DO YOU KNOW THAT --

The largest storage battery in the world has a capacity of 9000 ampere hours.

The Dead Sea contains no life of any kind, except a few microbes, and sea fish put into its waters soon die.

Bureau

The pilot-balloons sent up by the Weather Bureau to measure the winds aloft are made in three colors. White balloons are used when the sky is clear; red or black balloons when it is cloudy, the choice depending on the amount and kind of clouds. Maximum duration of visibility is thus secured.

A telephone conversation was recently held between a ship 100 miles off the Atlantic coast of the United States and Catalina Island, 30 miles off the coast of California, wireless telephony being used over the water and wire telephony over the land. This is the first time the voice of man has been carried across a continent and stretches of two adjacent oceans.

DO YOU KNOW THAT --

It has been shown that if beans are germinated the digestibility of their proteins is increased.

The total production of gold from the earliest times down to the present day is estimated at 20,000 tons.

The mathematical prodigy, whose case is reported in the "Lancet," was able to give the square root of any number running into four figures in an average of four seconds and the cube root of any number running into six figures in six seconds. He gave the cube root of 465,474,375 (which is 775) in 13 seconds. These feats, and others even more remarkable, he performed without resort to writing, as he was blind from birth.

A large number of biographies of wholly fictitious botanists were included in a well-known American reference work, published about thirty years ago, and have been copied in subsequent works, along with the titles of the writings, equally imaginary, attributed to these persons.

DO YOU KNOW THAT --

Gold lace is made by winding gilded silver wire around silk. The wire used for this purpose is drawn to such fineness that a mile and a quarter of it weighs only an ounce, while an ounce of gold covers a length of wire of more than 100 miles.

A patent has been taken out for railway cards made of reenforced concrete.

An indigometer is an instrument for determining the strength of an indigo solution.

Gasoline users will be interested to know that the search for cheap sources of power alcohol still continued. A recent writer in "Nature" suggests that foodstuffs are too valuable at present for such uses but thinks that waste land in Ireland might be used to produce crops to be utilized in this way. Arrowroot, cassava, and corn are possibilities in tropical countries; and a number of cellulose materials, such as straw and sawdust, offer possibilities in industrial regions.

DO YOU KNOW THAT --

More than 160,000 forest fires have occurred in the United States during the past five years. Of these, 80 per cent were due to human agencies and were therefore preventable.

There are more than a million telephones in the city of New York and ninety exchanges are required to accommodate them.

England is importing fresh-cut tulips from Holland by aeroplane.

Buffon and other naturalists of his time believed that human beings from 10 to 15 feet in height had once inhabited the earth, but this idea is now entirely discredited.

DO YOU KNOW THAT --

The poet Chaucer wrote a treatise on the astrolabe, an instrument formerly used for measuring the altitude of celestial bodies and determining latitude.

Captain Cook, the famous navigator of the 18th century, was the most skillful hydrographic surveyor of his time. His charts of the coast of Newfoundland are not yet wholly superseded by the more detailed surveys of modern times, and his charts of the Society Islands, in the Pacific, were used officially for 120 years after his death.

An acoumeter or acousimeter is an instrument for measuring the acuteness of the sense of hearing.

An aesthesiometer is an instrument for determining at how short a distance two impressions on the skin can be distinguished.

DO YOU KNOW THAT --

Oriental rubies are worth several times as much as diamonds of the same weight.

An unusual rotation of crops, consisting of fish two years and oats one year, is reported by a recent writer in the Scottish Journal of Agriculture. This occurs in some localities in the reclaimed regions along the coast of England and the continent. The fish are raised in shallow pools, which are drained and cultivated every third year.

The California Walnut Growers' Association will utilize the shells, which are a by-product of the cracking plants, by converting them into charcoal, such as was used in gas mask manufacture during the war.

The damage done by an earthquake is generally limited to a small area, but the great quake that occurred in Assam, in 1897, was destructive over an area of 150,000 square miles.
