

SCIENCE NEWS - LETTER

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No. 70

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UNCOVERS MEXICAN POMPEII;
EXTENDS HISTORY CENTURIES

San Fernando, Tlalpam, Mexico. - Discovery of an archaic pyramid, buried thousands of years ago beneath tons of volcanic ash, in the San Cuicuilco hill near Mexico City, pushes human history in America back many centuries and indicates that the early populations of this land began the mastery of the material universe about them probably quite as soon as did the primitive peoples surrounding the Mediterranean sea, according to Dr. Byron Cummings, director of the Arizona State Museum, who has charge of the excavations now being made by the Mexican Government.

This ancient structure, found by Dr. Cummings in collaboration with Dr. Manuel Gamio, director of Anthropology and Archaeology of Mexico, is composed of chunks of unhewn volcanic rock and rises in four terraces with inclined walls from a base approximately 400 feet in diameter to a height of about 100 feet, but it has not yet been uncovered sufficiently to determine the measurements more exactly.

"As in old Pompeii the mighty forces of nature covered and sealed the handiwork of man that it might speak to future generations," says Dr. Cummings, "so here in the southern end of the valley of Mexico, lava from the ancient Ajusco volcano has preserved a chapter of human history, although more primitive, yet not less interesting than the worn pavements and marble peristyles of the ancient city of the Italian coast.

"Cuicuilco is an illustration of one of the first pyramids reared by the ancestors of those tribes who adorned Mexico not only with mighty pyramids, but also with richly decorated temples and palaces before the first century of our era. This crude pyramid, unembellished and unadorned, yet massive and solid, stands a mute evidence that the

native American developed his masterful architecture here on American soil.

"The excavations show that this massive structure had been covered with volcanic mud and ashes so long before its final burial by the lava from the Ajusco cone that at that time abundant vegetation was growing on it.

"When we consider," Dr. Cummings explains, "that this pyramid must have been built before some great eruption in the vicinity sent forth its deluging shower of ashes, mud, and pumice, and that this calamity occurred long before the flow from Ajusco which careful calculation places between two and three thousand years ago; and that no polished stone implements are found, that the stone implements are grinding and polishing stones, flaked knives, borers and scrapers; that the pottery even near the surface is crude and archaic; that the entire structure contains no hewn stone and no cement or plaster in any form, we realize that architecture had its beginning in Mexico long before the Christian era.

"How long were the people of Cuicuilco in developing the ability to rear this massive pyramid?" he asks. "Through how many centuries had this American branch of the human family struggled before they gained sufficient mastery of material things and sufficient social and political cooperation and organization to produce such results? How many centuries elapsed between the building of Cuicuilco and the ornate pyramid of Quetzalcoatl at Tectihucan which Dr. Gamio estimates was built before the first century, 'A.D.?'"

"Human progress," he points out, "has always been slow; and early American progress was no exception to the natural course of events. This pyramid, then, opens up a chapter of human progress on this side of the Atlantic of which men have dreamed but which has never been recorded in authentic annals."

DAYS OF RAIN

The heaviest rainfall that has occurred at Mount Wilson, California, elevation 5,740 feet, since rainfall observations were begun nearly 18 years ago, was recorded December 17 to 23, 1921. The records showed that 29.38 inches of rain fell. This is equivalent to 152.5 pounds of water to every square foot of surface, 33,214 tons per acre, and 21,257,280 tons per square mile.

DISCOVERS AGE DIFFERENCES
AMONG LOWEST LIFE FORMS

Washington. Bacteria, lowest one cell organisms, which reproduce by simply splitting apart, are subject to the same laws of life as human beings, suffer from an infant mortality such as gives rise to our "save the Babies" campaigns, and pass through a period comparable to the gasoline-burning stage of modern youth. These are facts discovered by Dr. James M. Sherman and William R. Albus of the Research Laboratories of the Dairy Division of the U. S. Department of Agriculture here.

According to Dr. Sherman, bacteriologists have heretofore considered that when one of these cells split the resulting two cells were exactly like the original organism. The reason, he says, that there has been no physiological difference noted is because study has generally been made with mature bacteria 24 hours or more old.

Realization of the fact that there are age differences in bacteria will be important in many technical operations and very likely will prove a factor in the preparation of serums and vaccines.

As these cells, at one period, split into new cells every ten minutes and as each cell is only about one two hundred and fifty thousandth of an inch wide, it would seem almost impossible to tell the old from the new. But by taking the life history of the bacteria into account this becomes easy, Dr. Sherman explains.

When one old cell is transferred to a new media, he says, there is a period of two hours in which no multiplication by division takes place. Then the one cell splits into two cells and in ten or fifteen minutes each of the two split and so on multiplying rapidly until the growth is about eight hours old, when reproduction begins to slacken considerably until in twenty-four hours there is little, if any, further division.

The cells from two to eight hours old, he points out, are dividing so rapidly that all of them must necessarily be young. When the cells at this stage are tested with heat, cold, and chemicals in comparison with the bacteria twenty-four hours or more old, among which there are comparatively few new individuals, a great difference

is found.

The young bacterial cells of both bacterium coli and proteus vulgaris which were tested proved far more sensitive to the hazards of their environment than the oldsters. "It appears probable," says Dr. Sherman, "that in the struggle for existence among these minute creatures there occurs a normal 'infant mortality' such as exists in the human race."

Within the two hour development before the cell starts dividing there is still locked a great mystery. During that time, the older the newly transplanted old cell becomes the younger it gets. It goes through a sort of rejuvenation and actually accomplishes in its new environment that for which Ponce de Leon braved the seas and swamps and that which modern surgeons are trying to do by transplanting glands into old men.

RADIO NEWS OF THE WEEK

RADIO LEAGUE PRIZE FOR
 SUPER-REGENERATION OPERATION

Hartford, Conn. In order to stimulate extensive experimentation with the new Armstrong system of super-regeneration which is holding the interest of the amateurs, the American Radio Relay League, through its official organ, QST, has offered a prize for the best article on a practical working super-regenerative circuit. Reports of trials of the new system in amateur circles have been disappointing but it is hoped that someone will be able to supply a circuit of a modification of this new system that will prove beyond a doubt its superiority over former regenerative systems.

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RADIO MANUFACTURERS
 ORGANIZE CHAMBER

Washington. - Radio manufacturers meeting here have formally organized a National Radio Chamber of Commerce that will promote cooperation in this relatively new field. They hope to bring about a standardization of practice and of basic material that will rapidly promote the science of radio. Although some of the largest manufacturers of radio apparatus are not yet included in the organization, the present members predict an expansion in the future.

RADIOPHONE USED TO TEACH RADIO CODE

Hartford, Conn. Novice radiophone listeners have been given a chance to learn the Morse International Code through a combination of spark code and telephone broadcasting being sent out from IAW, the radio station of H. P. Maxim, president of the American Radio Relay League. There seems to be a growing interest in code and amateur work among the novices.

The method used by Mr. Maxim is novel; a 10 watt radiophone is used to explain the code and the formation of the characters and these are illustrated by sending out with a spark set the actual dots and dashes. In this way, the student becomes accustomed to learning the code by the oral rather than the visual method and finds it very much easier to become proficient. So many letters of approval have been received that the league is seriously considering a nation wide agitation for the adoption of a similar service, either from the stations of members or other interests who would be willing to undertake this work.

AGRICULTURAL NEWS OF THE WEEK

MEASURE GROWTH RATE OF CHOICE CHICKEN PARTS

Lincoln, Nebr.,

Specialists dealing with subnormal

conditions in children will have a scientific basis for their work if the experiments which Prof. H. B. Latimer of the University of Nebraska is conducting on white Leghorn chickens can be used to advantage in studying human beings. He has made autopsies of 94 chickens at ages all the way from time of hatching to 300 days old and of 6 mature chickens, taking the weights of the various parts of the body at each age and comparing them. The next experiments will be to feed chickens on special foods for a time before killing them and then to observe the effect on each organ. It is not known whether these foods would have the same effect on human beings, but this will at least be a starting point for observing the effects of special foods on subnormal conditions in humans.

Poultrymen are interested because this is the first bit of scientific research in regard to the growth of the organs and parts of chickens. Observations show that 60 days is the most economical age to sell cockerels.

(A Chat on Science)

MIND-CLEANING TIME

By Dr. Edwin E. Slosson

Housecleaning time, when every article of furniture from cellar to garret is handled and dusted, occurs traditionally each spring. An annual purification of the spiritual nature, when we overhaul and furbish up our morals, is set by all the churches. We are urged to subject ourselves to periodic physician examinations.

Yet it is quite as important to keep our minds in good condition as our houses, our consciences or our bodies. Error is as contagious as disease. A false belief may make more trouble in the world than a wrong intention.

Vacation is a good time to overhaul your brain from the frontal lobe to the cerebellum. Review your axioms, revise your postulates, and reconsider the unexpressed minor premises of your habitual forms of logic. All your reasoning, however correct; all your knowledge, however great, may be vitiated by some fundamental fallacy, carelessly adopted and uncritically retained. Get a lamp and peer into all the dark corners of your mind. No doubt, you keep the halls and reception rooms that are exposed in conversation to your friends in fairly decent and creditable order. But how would you like to let them look into your cerebral garret and subliminal cellar, where the toys of childhood and the prejudices you inherited from your ancestors mold and rot?

Hunt out and destroy with great care every old rag of superstition, for these are liable at any time to start that spontaneous combustion of ideas we call fanaticism against which there is no insurance. The bigger the brain the more dangerous such things are, for they have the more fuel. A little decaying superstition in the mind of a great man has been known to conflagrate a nation.

Errors breed errors. They multiply like microbes, especially through neglect. A single false belief may infect all the sound facts you pile in on top of it. Better an empty room than a rubbish heap. In the words of our American philosopher, Josh

Billings, "it is better not to know so many things than to know so many things that are not so."

Go systematically through your intellectual equipment and see wherein it is deficient. Add annuals to your mental cyclopedia. Pick up each one of the sciences where you left off at school and bring it down to date. Look over the fields of art and literature to see what you have missed or misconceived. Don't let your sociology get too far behind the age. See that your philosophy and psychology bear the same date as the calendar. Examine your religious creed in the light of modern knowledge to see if it needs revision. Take down the atlas and consider how long it has been since you heard from each country. Visit the planets in turn. Take another view of ancient history through the telescope provided by modern scholarship.

This inspection of one's stock of ideas is necessary because they do not keep as if they were in cold storage. They do not remain unchanged when stored away and neglected. There is a lot of thinking going on in our brains that we do not know anything about. Ideas are apt to sprout or spoil, like potatoes in a cellar. Facts will ferment from yeasty thoughts until they intoxicate the brain. Falsehoods generate ptomaines, poisoning the mind and producing inexplicable disease and death. You can not be too careful. Clean out your mind at least once a year.

HIGH COST OF DYING PROMOTES CREMATION

New York. - Urging cremation as a more sanitary and economical method of disposal of bodies, Dr. S. Adolphus Knopf has compiled statistics from fifty prominent sanitarians, ethical and religious teachers, to show that funeral and burial expenses are too high, that there is possibly danger of infection from interred bodies, and that ground in congested districts could better be used for public parks than grave-yards.

Most of the clergyman answering the questionnaire claimed that there is no reason, scriptural or ethical, against cremation. The only objection that can be raised, according to Dr. Knopf, is that the burning of a body may destroy evidences of poisoning or foul play. This could be overcome by requiring rigid examinations of the body under certain conditions for the cause of death.

NEWS OF THE STARSMOST MASSIVE DOUBLE STARS DISCOVERED

By Isabel M. Lewis
of the U.S. Naval Observatory

The discovery of a pair of exceptionally massive stars by Dr. J. S. Plaskett, director of the Dominion Astrophysical Observatory at Victoria, B. C., may have an important bearing on existing theories regarding the constitution and development of the stars since it shows that the masses, as well as the diameters, of the stars may be much greater than was formerly believed possible.

Upon examining the spectrum of a faint, sixth magnitude star in the constellation of Monoceros just to the east of Orion that had been photographed by means of the spectroscope attached to the 72-inch reflector, Dr. Plaskett observed that this star was made up of two stars nearly equal in brightness in close and rapid revolution about a common center of gravity. Additional photographs of the spectrum of this double star were taken at short intervals and measurements of the displacements of the spectral lines showed that the stars were revolving about their common center of gravity in the extremely short period of fourteen and a half days with the remarkably high velocities of 128 miles and 154 miles per second respectively, and at a distance of 55,000,000 miles from each other.

A simple computation based upon deductions from the universal law of gravitation showed that the combined mass of this system must be at least 139 times that of the sun which is about four times that of the highest limit previously found for the mass of the stars. From measurements of the absolute displacements of the spectral lines of the two stars from the normal positions it was found that the mass of the brighter star is at least 76 times and of the fainter star at least 53 times that of the sun. If the unknown inclination of the plane of revolution of the two stars to the line of sight is high, the masses of the stars would be considerably greater than the values given which are lower limits for the masses of these stars.

A study of the spectral lines of this star-system showed that it belongs to the class of Orion stars which are the most massive and hottest of all stars. A knowledge of the characteristic of stars of this class led Dr. Plaskett to conclude that the densities of these two stars are about one-hundredth of that of the sun and that they radiate unit for unit of surface area forty times as much light as the sun.

When the mass and density of a star is known its volume can be found since volume equals mass divided by density. Knowing the volume, the diameter, surface area and luminosity of the star compared to that of the sun can be found. It was found thus that the larger of these two suns has a diameter of 17,000,000 miles and is 15,000 times more luminous than the sun, while the smaller of the two has a diameter of 15,000,000 miles and is 12,000 times more luminous than the sun. The combined system, then, is 27,000 times more luminous than the sun. From the simple relationship existing between true and apparent brightness the distance of these two suns from the earth is found to be ten thousand light-years or six hundred and thirty million times the distance from the earth to the sun.

In actual size or bulk the two members of this system are greatly surpassed by either of the red giants Antares or Betelgeuse which have diameters respectively 502 and 318 times that of the sun. The densities of the red giants are so extremely low, however, that they probably contain a smaller quantity of matter or are less massive, that is, than these smaller, hotter and denser stars, though nothing is known definitely regarding the mass of the red giant stars.

ARCTICS BEING WORN
BY ADVENTUROUS SEX

Washington. Whether modern girls are becoming more adventurous or Alaska more tame, statistics recently published by the Eugenics Research Association indicate that our northern territory is becoming less a nomadic land of single cussedness and settling down more to starting the home fires burning. There has been a continually approaching balance in the number of males to 100 females. In the total population this ratio has moved as follows: In 1900, 258.9, in 1910, 247.9, in 1920, 168.5.

"Industrially, eugenically, and socially, the great need of the territory is settlers who move into the region with their families," says the report. "Perhaps the distribution of age groups with sex-ratios indicates approaching stabilization of population. In 1920 the sex-ratios by age groups were; 40 and more years of age, 304.5 males to 100 females; 20 to 39 years of age, 171.1 males to 100 females; under 20 years of age 100.7 males to 100 females."

PICNICING CHIGGER
HAS DARK PAST

Washington. Why is a chigger? The ankle-scratching vacationist may ask himself the question, but according to Dr. H. E. Ewing, of the Smithsonian Institution, not only is there no answer but where it goes in the fall and winter and what forms it passes through and just how long it operates in the summer are mysteries which no entomological Sherlock Holmes has ever been able to solve.

Like most folks with a bad reputation, Dr. Ewing points out, the chigger sometimes gets blamed for ^{that} which it is not responsible. Fleas, other insects, and nettling plants cause many of the so-called chigger bites while food and hot weather may produce hives which is often mistaken for the work of the dweller in the blackberry patch.

Popular opinion also credits this mite with burrowing into the human body, or climbing through the holes in the skin. Dr. Ewing says, however, that this is wrong. As small as the chigger is, about two thousandths of an inch, it is not so small as the skin pore and the microscope has shown that it does not dig in but merely attaches itself to the skin by means of its mouth parts.

It is easier for it to attach itself to tender skin and for that reason women and children appear to suffer more from the attacks than men. Nobody is immune, however, and the difference in injury to members of the same picnic party is largely a question of difference in clothing, especially about the feet and ankles. Wrapped leggings furnish almost complete protection against this pest which works from the ground up and seldom gets above the belt.

Kerosene, oil of citronella, ammonia, cooking soda, and camphor are said to be good pallatives, as is alcohol. An alcohol rub hardens the skin making it difficult for the chigger to attach itself and kills the little pest in from one to three minutes.

SHIFT GEARS EARLY AND SAVE GASOLINE

Washington. "In ascending a hill don't wait until the last second to shift to a lower gear. If you do, you will not only lose speed and overtax your engine but you will also consume more gasoline." This is the warning to motorists issued by the Bureau of Public Roads and based on tests conducted by Prof. T. R. Agg of Iowa State College working with the Bureau under the auspices of the National Research Council.

The common practice of waiting to shift gears on hills until the car has almost come to a stop is one of the principal causes of waste of gasoline, they say. In discovering the economy of the early shift, vehicles were used which were equipped with an ingenious device which makes a continuous record of the gasoline consumed as the vehicle moves over the road and another which makes a simultaneous record of the speed at every instant. Suitable sections of road were selected for the tests and the exact grades of these sections were determined. The specially equipped vehicles, both trucks and automobiles, were then driven over the various sections taking the record of the gasoline consumption and speed with the two instruments described. Several trips were made over each section, and the rate of fuel consumption and speed for each trip was obtained.

HAS CURE FOR BACK-ACHE OF BAIT-DIGGING WESTERNER

New York. - Many fisherman in the west are unnecessarily blistering their hands and straining their backs digging fish worms, according to B.P. Holland, vice-president of the American Game Protective Association, who tells how they may get this sort of bait with much less exertion. "Several years ago upon coming east to live," he says, "I was told that the only way to secure fish worms was to take a flash-light and go out at night and pick them off the lawn. Very carefully and wisely I looked at this method as another form of snipe hunting and made vows that no wise birds would take me out and leave me holding the sack." Claiming that there are many anglers in the west who still have the same viewpoint, he says that where the lawn grass has been cut closely and well watered it is an easy matter to pick up half a can full of good big worms in an hour, but it takes skill to catch them. You cannot pick them up like you do when you turn over a shovel full of earth. Each worm has a good grip on the hole he has just crawled out of, and when he sees you coming for him he can snap back in with about the alacrity of a fully stretched rubber band. Get your flash-light and go out and try it. ---

REVEALS STORM'S SECRET
OF RAIN DISTRIBUTION

Worcester, Mass. - Where does the local storm start? This question which has been lurking in the backhall of most folks' minds since childhood is answered by Prof. Charles F. Brooks, professor of meteorology of Clark University, here.

Says Prof. Brooks: "Local thunderstorms tend to originate most often where large volumes of moist air are readily warmed and forced upward; that is, over broad expanses of meadow-land or river flats, over cities, hills, and mountains.

"Within a homogeneous area, however, the wetting of strips by local showers temporarily makes the dry strips the loci of thunderstorm formation. At College Station, Texas, during a rainy week in the latter part of August, this phenomenon was noted very clearly and local forecasts of thunderstorm rains were successfully based on the widths and position of strips wet by thunderstorms on the preceding day.

"Daily rainfall statistics for stations within a homogeneous region for a period of local showers show marked differences in totals for any day. But," he says, "less important differences are noted for the period taken as a whole. Any area that escapes rain on the first day or two, heats more readily than the surrounding wet areas, and so becomes the center of greater expansion and inflow from the surroundings and in consequence is wet by the resulting shower.

"Or even if the shower produced by the local rising air is carried to other fields before discharging, any approaching shower will develop most strongly over the dry area and therefore drench it more than those previously wet.

"Before a local thunderstorm can form, however, there must be large local upward streams of air, violent convection and abundant condensation of moisture. This makes the forecasting of storms a very complicated matter."

EDITORIALSEARCHES INTO THE PAST

Archeological digging near Mexico City by American and Mexican scientists has unearthed a pyramid believed to be older than any other man-made monument on this continent. Thousands of years ago it was inundated by lava; years before that pre-historic Americans began climbing upward to civilization. Early population on this continent began its progress fully as early as that of the Mediterranean, these scientists believe.

In Asia there is an expedition searching for early traces of man which they hope will antedate *Pithecanthropus erectus*, the ape man. Nebraska was recently searched for the bones of the possessor of a single tooth, believed to be the remnant of an intermediary between man and ape. The sites of ancient races in all parts of the world are continually giving up their secrets.

With the failure of history recorded on paper, parchment, papyrus, baked bricks, carved rocks, or in the legends of men, the archeologist takes up the task of the historian. And before the man-made layers peter out, the paleontologist, the scientific reader of the writings of nature, inaugurates his work of deciphering the world's dark past. The skeletal remains of the animals and lower forms of life of past eras and the tumbled layers of the earth enable him to read the record of the rocks.

Astronomers assume the burden of extending the knowledge of the past when earthly scientists must stop. They study the evolution of other suns, they can chart the maneuverings of additional universes. ~~The light of~~ The human race is but a tick on the clock of the heavens. Dr. Plaskett, Canadian astronomer, discovers twin suns more massive than any star yet found. But his up-to-the-minute observations are necessarily 10,000 years old. When the light of the Plaskett twin suns left them for our earth, the early human race was in its cradle and was still working and playing with stone instead of metal.

DO YOU KNOW THAT -

Recent experiments indicate that the pulse beat can be modified by the mere taste of certain foods, drugs, beverages, and condiments.

There is a startling resemblance between the shape of the skull of our little horned toad and the fossil skull of the gigantic extinct reptile *Styracosaurus*.

Railroad mileage in the United States has increased from 53,000 miles in 1870 to almost 253,000 miles.

Some insects can distinguish between colors. Blue is said to be the favorite color of the honeybee, while ants prefer violet.

DO YOU KNOW THAT -

Where the percentage of negro population is highest, the cancer death rate is lowest.

A process for seasoning wood which gives results in 20 days which would naturally take several years is said to have been invented in France and consists of subjecting the wood to the action of a current of air containing ozone.

A fossil of a dogwood flower was recently discovered in rocks which show that it bloomed at a time when the great dinosaurs still roamed the earth.

The United States produces only 0.43 per cent of the world's fuel briquets; the industry being developed chiefly in countries where a large part of the available coal is of low grade and unsuitable for use in the raw state.

DO YOU KNOW THAT -

It is reported that Great Britain's passenger carrying aircraft will shortly be required to provide aerial life preservers, in the form of parachutes, for each passenger.

Light, travelling with the speed of a radio signal, comes the 43,000,000 miles from Mars in less than four minutes; but Antares, the largest star seen by the naked eye, is so far away that its light which is now reaching us left it 350 years ago.

Candelilla wax obtained from a Mexican weed is the main ingredient in shoe polishes used on brown and tan shoes.

Among certain ants, the ant-hills fall into decay and degenerate females are produced when the parasites from which the ants obtain their intoxicants become very numerous.

No. 70

DO YOU KNOW THAT -

Alginate acid obtained from sea weed promises to become an important commercial product for use in the preparation of waterproof fabrics.

Weather data is being sent by wireless to English agricultural fair grounds, where it is exhibited on a large chart with a forecaster in attendance to explain how deductions of local interest can be drawn.

Bronze castings were made by the Egyptians 2,000 years before Christ.

Complaints that many birds had been killed by oil waste, caused the Northern Pacific R.R. to install an oil recovery plant at Las Vegas, Nevada, which it is said will not only eliminate the menace to water fowl but prove a source of revenue to the company.

DO YOU KNOW THAT -

You breathe out enough carbon every hour, in the form of carbonic acid gas, to make a diamond worth over \$75,000,

Scientists are working to reduce the weight of the British army rifle from 8 pounds 10½ ounces to 6 pounds.

Where it is impracticable to use oil on lakes, ponds, and slow moving streams, stocking the waters with minnows and other fish which feed upon the larvae is an effective means of destroying mosquitoes.

Tucum fiber, combed from the leaflets of Paraguayan palms, is used for the flaxen curls of "Made in Germany" dolls.

DO YOU KNOW THAT -

Siam is holding a lottery to raise money for the development of her Air Service.

Mt. Everest is only about 29,000 feet high, but the sea off Ladrone Islands is 31,620 feet deep.

When the approaching thunderstorm is within hearing, its distance away, in miles, is very nearly the number of seconds between the lightning flash and its subsequent thunder divided by five.

Thirty years ago the general death rate of New York State was over twenty for every 1,000 persons, while last year it was only twelve or a gain of eight lives saved to every thousand persons.

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