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### THREE RINGS TELL HISTORY OF ANCIENT INDIAN RUINS

(By Science Service) ✓

Tucson, Arizona. May .- Giant trees of the southwestern plateaus are a time link between the civilization of today and the ages when prehistoric Indians erected stone and timber temples in the canyons of what is now Arizona and New Mexico, Dr. A. E. Douglass of the University of Arizona here has discovered. He has found that the beams used in the construction of these ancient houses contain the same annual rings of growth that are present in trees that are now alive and growing on the Colorado plateau, and he is making these records of nature bring to life long buried historic facts about the ruins.

"In the dry regions of the southwest, pine trees are strongly affected by climatic conditions, putting on larger rings when the rainfall is abundant and forming very thin rings when the season is dry," Dr. Douglass explains. "These characteristics may be found in practically all the trees in the forests on the Colorado plateau in Northern Arizona and New Mexico, and it is possible to identify the same rings in nearly all the trees."

In the hundreds of tree trunks which the Indians used in constructing the great building at Aztec, New Mexico, he has found it easy to trace identical rings, and by assigning a number to certain ones a simple counting of the rings to the outside gave the relative dates at which all the different timbers were cut.

By this method he has ascertained that the great building of 450 rooms at Aztec took only about ten years to build, and that the structure was begun at the east end and finished at the west; that in one case of three stories they must have been built in immediate succession.

Still more interesting was the discovery that the tree rings in the timbers in the great ruin of Pueblo Bonito in Chaco Canyon, fifty miles south of Aztec, not only show that they were cut within a very few years of each other, but also show that they were cut from forty to forty-five years before the timbers at Aztec. This gives then, the actual number of years between the construction of two great Pueblo buildings, and opens up the way for a definite chronology of the various ruins of the Southwest.

The trees that were cut down ages ago by the Indians and that now share equally with the living trees of today in the honor of being the most authentic pages of earliest history, were transported many miles to the building sites. The Indians used their trunks as beams to make the ceilings for their larger rooms. Across these beams they laid small straight poles and on the poles they placed brush and a thick earthen floor. Some of the ruins contain four or five hundred rooms.

CONGRESS TO CONSIDER METRIC  
WEIGHTS AND MEASURES SYSTEM

(By Science Service)

Washington, May .- Extensive public hearings will be held shortly on the metric legislation now in Congress, it has been announced. The various reasons for and against the adoption of the metric system of weights and measures to replace the English system now in use in ordinary trade and commerce will be heard and considered by the House Committee on Coinage, Weights and Measures.

The metric system is used in all parts of the world, and in many cases has replaced less logical systems of weights and measures. France; Germany, and other foreign countries have adopted the decimal systems. Japan has just enacted a law providing for the change of its weights and measures to the metric system within twenty years. The use of the metric system has been legal in the United States for many years, and because of its simplicity has been used in the sciences extensively. During the war metric weights and measures were used in trade and industry to a larger extent than ever before in this country.

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PROF. EINSTEIN  
LECTURES AT PRINCETON

(By Science Service)

Princeton, N.J. May .- Prof. Albert Einstein, propounder of the theory of relativity, is delivering a series of lectures here at Princeton University. Noted physicists from all parts of the country are attending these addresses at which he is explaining his theories that have attracted the attention of the scientific and lay worlds. The series of five addresses two popular and three scientific which he is delivering in German began on Monday (May 9).

Prof. Einstein has just returned from lecturing at the University of Chicago.

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ARCHITECTS HOLD  
ANNUAL CONVENTION

(By Science Service)

For use Thursday, May 12.

Washington, May 11. - How to plan towns and what kind of high buildings should be permitted on narrow streets are among the questions that were discussed at the fifty-fourth annual convention of the American Institute of Architects that opened here today.

Over three hundred delegates from the 46 chapters that are located in all parts of the country are attending, and a feature of the meeting is an exhibition of architectural drawings of small houses which have been designed by representative members in nearly every state of the Union. The relations of architecture to education were discussed at a conference held this evening.

Tomorrow there will be a session devoted to the building industry, and in the evening the Department of Public Works and its effect on the architecture of government buildings will be discussed. Herbert Hoover, Secretary of Commerce will be one of the speakers.

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MADAME CURIE, DISCOVERER OF RADIUM

By Dr. Harvey W. Wiley,

Pure Food Expert, and Former Chief of the Bureau of Chemistry, of the Department of Agriculture.

(Editors: It is suggested that this graphic account of Madame Curie and her wonderful discovery of radium that Dr. Wiley has written for Science Service be held for use when telegraphic dispatches state that Madame Curie has arrived in this country from France. She sailed on the Olympic on Wednesday May 4 and will arrive in New York this week.)

The visit of Madame Curie, the most eminent living chemist of today, excites great interest not only among the chemists of the country, but among scientific people in general, and also the public. Extensive arrangements are making to receive this distinguished personage properly. She is certain to receive abundant evidences of appreciation of her work and her personality, by the American people. This will be shown not only socially, but officially in all the cities which she will honor with her presence. The scientific element of our people are not slow to recognize the opportunity to pay the proper homage to her. The chemists of the country particularly should be active in this matter and somewhere, I think preferably in the National Capital, the chemists of the United States should, as a representative body, recognize her distinguished services to our science.

Madame Curie has performed a miracle, She has led us into the hall of nature's great mystery, barred so many ages from the profanation of human view. Not Dickens, nor yet Victor Hugo, could ever have projected radium into fiction. Even they could not create a new element endowed with such subtle character and animated by such an unimaginable soul. Even Carroll with all his brilliant imagination, as expressed by the experiences of Alice in Wonderland, could have created nothing so wonderful. The writers of fiction only gather up the disiecta membra of facts and string them together into an attractive, yet ungainly form.

One of the forms which has been taken in regard to the reception of Madame Curie is in the organization of a plan to give to her when she comes to this country, a gram of radium.

The rejuvenated Poland is much in the public eye. One of the greatest musicians has abandoned his profession and served for a time as Premier of that great patriotic country. Poland, for 150 years, has been suppressed as a nation. Poland has produced great patriots, great musicians and great poets, but Poland has produced nothing so great as this little woman, Marie Sklodowska. Anatole France once said, in praising his native country: "France has two geniuses - Rodin and Madame Curie". This, of course, was written before the great war and before Clemenceau and Foch. It was fortunate that in her marriage Madame Curie became an adopted French woman.

She was the daughter of a professor in a high school of Warsaw and was born on November 7, 1867. She was left as the head of the house, as far as women were concerned, by the early death of her mother. In the environment in which young Marie lived, she was taught to hate the Russian autocracy, and became a revolutionist. Owing to the complications of her revolutionary surroundings she decided to leave Poland. It was while this young girl was engaged in the Sorbonne washing bottles and cleaning laboratories that she met her future husband Pierre Curie, a promising chemical pupil of Prof. Lippmann of the Sorbonne. In 1895 they were married. They both were poor insofar as

this world's goods are concerned, but they were rich in sympathy and in ambition and richer still in mental insight and activity. It was not until 3 years after her marriage that she took her degree in mathematics and physical sciences.

In experimenting with minerals of different kinds to see if any of them had any properties of emitting the x-rays discovered shortly before this time by Rontgen, Madame Curie noticed that pitchblende had a wonderful power of affecting a gold leaf electroscope in a partly exhausted tube. As most of the uranium which the pitchblende contained had been extracted and yet the remaining portion was far more active in developing the leaves of gold than it was before, Madame Curie came to the conclusion that there was something in pitchblende capable of emitting rays other than uranium. Her husband joined her in the subsequent investigations to see if this unknown substance could be identified. The delicacy and ingenuity of the experiments carried on by these two investigators rank as among the leading achievements of chemical science. They succeeded in separating a salt which by reason of the facility with which it emitted rays was called radium. The fact that this was an entirely new element was also disclosed by the spectrum which it gave being different from any other known substance.

This discovery is entirely antagonistic to some of the established theories of chemical science, among them the conviction that it was not possible to transmute one kind of a body into another. It was also soon discovered that there were various types of emanations given off from radium and one of these types was found to be helium, another element of wonderful properties. These discoveries of the Curies were later confirmed by the classical researches of Sir William Ramsay and Prof. Soddy.

This pioneer work on radium consumed four years of her life, from 1898 to 1902. The result of these four years of discovery formed the subject of her thesis for the degree of Doctor of Science.

Soon after Madame Curie and her husband obtained immortality in the chemical world their married life was suddenly terminated by her husband's accidental death. In crossing the Rue Dauphine in Paris he was run over by a public carriage and instantly killed. For a time this tragedy interrupted her work, but soon she began it again and has continued it ever since.

One would think from the great publicity which radium has attained that everything was already known about it. In point of fact, the door has been only opened a little bit which leads further into this great mystery of physical science. What with the discovery of radium and the promulgation of the Einstein theory of gravity, it seems that the constants of nature are probably the most variable bodies in the world.

WHICH HUMAN ORGAN WILL  
GIVE WAY FIRST?

(By Science Service)

Dr. Oliver Wendell Holmes in his poem on the Deacon's one-horse shay described a vehicle in which the strength of every part was so proportioned to the strain that the whole collapse together in the end. But the human body is not so evenly constructed and certain organs, especially the lungs, heart and kidneys, are apt to show signs of weakness before the others and hence are responsible for a large proportion of the fatalities. But which is the dangerous point depends upon the age. Professor Raymond Pearl of Johns Hopkins University in collaboration with Chairman Howell has completed the most extensive analysis of the causes of death that has yet been undertaken and reported the results before the National Academy of Sciences at its recent meeting.

They find that the danger zone during the first year of a child's life is the alimentary canal. Nearly 70% of the male infants and over 40 per cent of the female infants dying under one year of age are victims to some disease of the digestive system.

In the next period of life which lasts till the 55th year the lungs and other parts of the respiratory system are the weak point. The mortality due to diseases of the organs of respiration amounts to over 50 per cent in infancy and decreases gradually to about 23 per cent at the age of 55.

After that age the heart and the circulatory system are most apt to show weakness and to cause death in an increasing proportion of cases.

The lesson of it may be summed up as: In infancy take care of the digestion; in maturity look out for the lungs; in old age watch the heart.

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## THE CACTUS FAMILY

(By Science Service)

The Carnegie Institution of Washington is publishing four large and richly illustrated volumes that will give descriptions and pictures of all the plants of the cactus family. This work represents the results of many years of investigation carried out in cooperation by the New York Botanical Garden, the United States Department of Agriculture and the United States National Museum.

It is particularly fitting that this exhaustive study should be undertaken by American botanists since the cactuses are peculiar to America. They have, however, been introduced into many parts of the old world and in places appear to be perfectly natural in their surroundings and seem to be a part of the native vegetation. In fact, they so easily become established that several species which were introduced into China after the discovery of America have been described as native to that country. Along the Riviera and in Spain a number of species have spread over the hills and waste places and have become quite an annoyance. In Australia several species have not only occupied the waste places, but have infested the best wheat lands of the country. Some of the Australian states have spent thousands of dollars in attempting to eradicate these pests and have even sent scientific commissions to America and Europe to obtain information as to methods for eradicating them, perhaps by natural enemies.

The species of cacti are distributed throughout the Americas, extending from southern Canada to the straits of Magellan, from Ocean to Ocean and from sea level to a height of about 14,000 feet. They are, however, most abundant in the southwestern United States, on the table lands of Mexico and in all the semi-arid regions of South America. While these plants often form the most dominant feature of the landscape in semi-arid regions, they are also represented in the humid regions, especially those of eastern South America.

The cacti are not of great economic value, considering the size of the family, but some of them do furnish valuable food products. Thousands of bushels of various kinds of these fruits are sold in the fruit markets on the table-lands of Mexico. In Sicily very fine fruits of prickly pears are grown and shipped to all parts of the world. About San Luis Potosi, Mexico, especially, large quantities of one of the cactus fruits are gathered and dried from which a kind of dry jam called *casa de tuna* is made. The Indians in the southwest gather the fruit of the giant cactus, known as *sahuara*, which they dry and preserve for their winter supplies. Other Indians in Lower California make from one of the cactus fruits a kind of beer which they greatly relish. In parts of southern Texas other species furnish a small sweetish fruit known as the strawberry cactus fruit. Another plant in central Mexico produces a great abundance of small berries called *garanbullos* which are gathered in great quantities by the Indians and used very much as we use raisins.

Some of the species have considerable value as forage plants and the United States Department of Agriculture has carried on a large series of growing and feeding experiments. The result of these studies shows that the chief value of the cactus for forage is as an emergency ration. Farmers, by careful feeding of their cattle on these plants can bring their stock through a severe drough in the deserts of Texas.

The amount of atmospheric nitrogen overlying a single square mile of the earth's surface is about 20,000,000 tons. If this could be made available for the use of mankind it would supply all the needs of agriculture and industry throughout the world for half a century.

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A heavy surf along oceanic shores causes vibrations in the earth that are registered by seismographs hundreds of miles inland.

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The gigantic stringybarks of Australia, various species of Eucalyptus, are the tallest trees in the world, far exceeding in height the famous "big trees" of California. They attain heights of from 400 to 500 feet.

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The "life-giving ozone" that figures in advertisements of health resorts is wholly mythical. The amount of natural ozone occurring anywhere near the earth's surface is so excessively minute as to be of no hygienic importance. In the upper atmosphere, many miles above the earth, this substance is relatively abundant.

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There are water-holes in some of the deserts of Western Australia that are dry by day but yield an abundant supply of water at night. Apparently the supply is regulated by changes in the shape of adjacent rocks, which expand during the hot days and contract after sundown.

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A mountain near Durango, Mexico, called the Cerro Mercado, is practically a solid mass of iron ore, 400 feet high, a mile and a half long, and from a third to half a mile wide. The ore is 60 to 75 per cent iron. It is estimated that there is fully 500 million tons of the ore above the surface of the plain, besides vast deposits beneath.

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Black opals are usually the result of artificial coloration, but true black opals have been mined extensively in a small district at the head of the River Darling in northern New South Wales.

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A superstitious belief prevails in Bolivia that there is some connection between mountain sickness and the presence of large mineral deposits in the mountains.

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The name "frost-fish" is applied on the South Island of New Zealand to fish of a deep-sea species (*Lepidopus caunatus*) often found lying dead on the shore during and after severe cold weather. It is a long ribbon-like fish of delicious flavor, and is eagerly sought for food.

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A new star blazed forth in the constellation Perseus in 1901. Measurements of its parallax indicate that its light takes 350 years to reach us. Hence the collision or other celestial catastrophe that caused its sudden appearance did not occur in 1901, but about 1551.

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