THE SCIENCE NEWS-LETTER

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EDITED BY WATSON DAVIS

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RELATIVITY THEORY FALLS IF EXPERIMENTS TRUE, SAYS EINSTEIN

The Einstein theory of relativity must fall or at least require radical modification, if the experiments performed at Mt. Wilson, California, by Prof. Dayton C. Miller, of Cleveland, are correct, is the opinion of Prof. Albert Einstein himself, expressed in a communication from him to Science Service.

"If Dr. Miller's results should be confirmed, " he says, " then the special relativity theory, and with it the general theory in its present form, falls. Experiment is the supreme judge. Only the equivalence of inertia and weight remain, which would lead to an essentially different theory."

The Mt. Wilson experiments were intended to show the motion of the earth through the ether in space by which light and other radiations are supposed to be transmitted. When originally performed by Prof. A. A. Michelson, now at the University of Chicago, and when repeated by Prof. Miller at Cleveland, no appreciable result was obtained. When Prof. Miller repeated it at Mr. Wilson, which is about a mile high, he obtained a marked effect, which seems to vary with the altitude.

According to Dr. Ludwik Silberstein, of the Eastman Kodak Company's Research Laboratory at Rochester, this indicated that the ether was dragged around by the earth at low altitudes, but drifted by at higher ones. According to Prof. A. S. Eddington, of Cambridge University, England, such an effect would produce a difference in the position of stars as observed from sea level and mountain observatories, and no such difference has ever been observed. Dr. Silberstein answered this objection by the statement that the ether undergoes a peculiar kind of deformation, but Prof. Einstein does not agree with him.

"I cannot share Dr. Silberstein's conception in case the experiments are correct, " says the Berlin savant. "He means that with a theory of a deformible but fixed ether the known,phenomena can be explained. This, however, is not so. A theory such as that is absolutely inconsistent with the positively proven astronomical aberrations. No theory exists, outside of the theory of relativity and the similar Lorentz theory, which, except for the Miller experiment, explains all the known phenomena up to date.

"Under these circumstances nothing remains but to await more complete publication of Miller's results. Then it is to be hoped that a correct decision will develop."

SCIENTISTS LAUNCH DRIVE FOR SCOPES SCHOLARSHIP

The scientists who went to Dayton to aid the counsel for John T. Scopes in defending the freedom of teaching and the facts of evolution are sponsoring the raising of a scholarship fund that will enable Mr. Scopes to continue his education at some graduate school of his own choosing.

"It is Mr. Scopes' desire to undertake graduate work in some branch of natural science," says a statement announcing the plans. " At present, however, he is without a teaching position or other means of obtaining the necessary money. Although he has been offered numerous lucrative lecture and stage engagements which would net him many thousands of dollars, he has refused them, wishing to avoid even the appearance of self-exploitation. Impressed with Mr. Scopes' intellectual qualities and modesty, and believing that he is entitled to some substantial recognition for the trying experiences that he has undergone in the service of science, and of liberty of thought and speech generally, the scientists who were associated with the defense have organized a committee to raise a scholarship fund of $5,000 to enable Mr.Scopes to undertake graduate work at an institution of higher learning of his own choosing during the next few years."

Dr. Maynard M. Metcalf of Oberlin College and Johns Hopkins University, the first scientist to testify in Mr. Scopes' behalf, has consented to act as chairman of the scholarship fund committee; Dr. Kirtley F. Mather, of Harvard Geological Museum, Cambridge , Mass., is vice-[illegible]chairman ; and Watson Davis, managing editor of Science Service, Washington, D. C., will act as secretary-treasurer

Other scientists who came to Dayton to testify for the defense included: Prof. William A. Kepner, University of Virginia; Dr. Jacob G. Lipman, director, Agricultural Experiment Station, New Brunswick, N.J.; Dr. Charles H. Judd, University of Chicago; Dr. Fay-Cooper Cole, University of Chicago; Wilbur A.Nelson, Tennessee state geologist; Dr. Winterton C. Curtis, University of Missouri, Dr. W. M. Goldsmith, Southwestern University; Dr. H. H. Newman, University of Chicago; Dr. Frank Thone, Science Service.

Readers of the Science News Letter who wish to assist in the recognition of Mr. Scopes' services to the cause of independence in scientific teaching are invited to contribute according to their ability, using the appended blank.

Frank Thone, Treasurer,
The John T. Scopes, Scholarship Fund,
B and 21st Streets,
Washington, D. C.

Enclosed is my check (or draft) for $....., which please accept as my contribution to the John T. Scopes Scholarship Fund.

(NAME) .....

(STREET).....

(CITY) .....

NEW SYPHILIS CURE FOUND IN FRANCE

What may be a sensational new cure for syphilis was unfolded before the French Academy of Sciences by Dr. Roux, the director of the Pasteur Institute, when he related the experiments conducted by M. Lavatte, one of his assistants at the Institute.

M. Lavatte has discovered a new chemical substance which he calls acetylozyamynaphenylynate; it is composed in part of arsenic and bismuth, in the respective percentages of 15 and 45.

When injected into the muscles of infected rabbits, this proved to have astonishing curative properties, small injections resulting in the symptoms of the disease disappearing within forty-eight hours, apart from sores, which took from four to five days to heal completely.

Two medical men, Drs. Fournier and Schwartz, tried this treatment on human patients. They selected thirty cases, in varying stages of the disease, which they treated with intramuscular injections of two cubic centimeters of the substance with the twenty-five letter name.

One curious feature observed was the utter absence of any discomfort, of any painful reactions during the whole course of twelve of these injections. The therapeutic effects were startling, the main symptoms disappearing within a few hours after the first injection and the sore healing with great rapidity. The Bordet-Wasserman test, on being applied at the end of the series to each subject, gave in every single case a negative reaction.

Dr. Roux added the remarkable fact that in every case, the treatment appeared to have a tonic effect on the general health of the patients.

FOODS BEST SOURCE OF VITAMINS, SAYS CHEMIST

Vitamins should be picked in the garden or bought at the market and not at the drugstore, is the advice given by Dr. D. Breese Jones, chief of the Protein Investigation Laboratory of the United States Bureau of Chemistry in a publication which summarizes present day knowledge of the subject. Many if not most of the commercial vitamin preparations now on the drug shelves are worthless, he said.

The mysterious, potent food accessories called vitamins are absolutely necessary to life, health and happiness in all its phases, and yet they provide neither theenergy with which the body does work nor the material from which flesh and bone are built, he states. They have been likened to the spark plug in the motor car, an accessory without which a whole tank full of gasoline would not turn a wheel. Low forms of life like plants make their own vitamins, but the higher forms like man and animal get them ready made in plant foods. Sometimes they are made over into animal foods such as butter and cod liver oil, the cow getting her vitamins in the meadow and the cod his from the sea algae.

Five vitamins now answer the roll call, but new ones are only awaiting discovery, scientists believe, and with each new discovery man's power over his own body increases. Research has well defined the powers of the known accessories and a number of such bodily processes as growth, reproduction and skeleton building have shown themselves to be mere functions of these vitamins.

Vitamin A is essential to growth and is therefore especially important to children and young animals. B is necessary at all stages of life, and without it the body is subject to such afflictions as beriberi. C prevents scurvy, D is the spark plug that enables the lime and phosphorus in food to join in the bone making process of the body and prevent rickets, the commonest nutritional disease among children in the temperate zone and which, authorities claim, effectsthree fourths of all infants in the great cities.

The youngest vitamin, E, controls reproduction. Animals fed on food that lacks this factor may grow to apparent health, but can never have young as long as the diet remains the same. Both the male and the female remain sterile. But as soon as this facor is added to the food the animals reproduce normally. Overdoses however do not increase fertility beyond normal.

CLAIMS MAN REACHED AMERICA DURING GLACIAL PERIOD

Asiatics in their long trek to the Americas reached Oregon during the ice age at least 25 thousand years ago, according to Dr. Edwin T. Hodge, professor of geology at the University of Oregon. These early migrants found the climate of that time equally hospitable and perhaps even more pleasant than that of the present tim The glaciers which occupied the crest of the Cascade Range were not due to low temperature, to change in direction of wind, nor to increased moisture content of the winds which then blew. These glaciers were due to mountains which then stood one thousand feet or more higher than they do today and as a result they robbed from the moist, warm westerly winds their moisture and their warmth.

The early presence of primitive explorers in Oregon during this period of warm, humid climate is shown by the discovery of fossils of a race of men who were antecedent to the Indians which the white man found here thousands of years later. These early men lived in the Willamette Valley in a "happy hunting ground" where mammoth, mastadon, giant sloth, camel and horse gave abundant animal food, where the river waters were stocked with fish, and where they roved among the sequoia, walnut, oak, and willow forests.

Previous studies of the Pleistocene, or Ice Age, of British Columbia, Washington, and Oregon have brought out two statements regarding the climate of that time.

They state that" the temperature gradually grew colder and finally culminated in the development of glaciers" and that a great sound occupying the Willamette Valley was developed at the close. This latter statement, if true, would likewise indicate a colder climate. The presence of a large body of water, in contrast to an equivalent land surface, reflects most of the light energy received, its latent heat is high and evaporation from whatever cause results in cooling.

As a result of studies extended over the past eight years, Dr. Hodge has arrived at conclusions which materially differ from those hitherto published regarding geological events of the Pleistocene period of Oregon and Washington.

The number of unemployed in England on June 22 was 1,299,700 , which is an increase of 286,000 over the previous year.

INVENTOR PERFECTS DEVICE TO ELIMINATE PHONOGRAPHS

A man sitting in an office in Berlin, Capetown, or Pekin may soon be able to dictate a letter which will be heard and taken down instantly by a stenographer in an office in New York.

This is one of the startling results of an invention perfected in the laboratory of the Berlin Telegraphie Gesellschaft, Ltd. , after secret experiments based on the researches of the Danish inventor Waldemar Poulsen. Briefly stated, the invention consists of a means of recording and storing sounds on steel. The inventor, Dr. Kurt Stille, has been eighteen years at work on this question.

The sounds are recorded on a steel wire by electromagnetic means, so that the wire bears no surface markings of any kind and can at will be "emptied" of its sound contents in readiness to receive others. The wire, which can be of any length desired, so that it may "take" the longest speeches or musical scores, can be connected with any telegraphic cable, which conveys the sounds farther.

It is predicted that within a short time every newspaper correspondent in the world will be able to dictate his articles direct to his office. New music or operas or plays or statesmen's speeches will be heard simultaneously in all parts of the world without the rasping, noisy interference which at present interferes with purity of sound by wireless transmission.

One of the incidental effects, it is said, will be to drive the phonograph out of business. Even in the most perfect phonograph models, there is always a faint scratching sound as the needle travels over the vulcanite plate, which is completely eliminated by this new process.

In the machine turned out by Dr. Stille, the very thin steel wire revolves on two spools, deriving its current from a small electro-magnet ; the sounds are conveyed by variations of the current. Pressing a button which induces another current "empties" the wire of its sound contents, which otherwise may be repeated at will and endure indefinitely.

The inventor describes the root principle of the invention in the following words: "We will suppose you want todictate a letter. The sounds you utter are conveyed by means of a microphone and send waves through an electric current. This current flows through a small electro-magnet. The magnetic force becomes alternately weakened or strengthened according to what one might call the 'rythm' of the electric current, which is of course based on the sound vibrations caused by the voice. This rythmical magnetized electric current is communicated to the steel wire as it gradually winds out of one sp ool onto the other. When you cease speaking, your words are recorded in invisible magnetic writing on the wire. To empty the wire of this writing is a very simple matter; one simply reverses the process and re-transforms the magnetic waves into ordinary sound-waves."

Instead of being "emptied" for further use, the charged wire, may be disconnected and stored up, when it will, on being reconnected, repeat its sound contents as often as it desired. The life of such a sound wire, unlike that of a phonograph plate, is limitless.

The manufacture of glass was started in Pittsburgh in 1797 and now it furnishes the United States with over half its window glass, a third of the plate glass and one eighth of its bottles.

NEW SUN CLOCK TELLS TIME ON DIAL

A new form of sun-dial that tells time to within thirty seconds on an ordinary clock face, has been received by F. Hope-Jones, chairman of the British Horological Institute, London, from the inventor, Prof. W. E. Cooke, government astronomer of Sydney, Australia, and is described by Mr. Hope-Jones in the magazine "Nature".

It consists of a ring which can move on pivots placed in a north and south plane, the position of the gnomon of the usual sun-dial. On one side of the ring is a small hole which, when the sun is shining , and the instrument is in use, casts a small spot of light on a figure 8 curve on the opposite side. This curve is marked with the date for various times of the year, and allows for the "equation of time" or the amount that the sun is ahead or behind its average position. To use it, the ring is turned until the spot of light is on the proper part of the curve, and the hands, which are geared to it, then indicate the correct time.

RADIOACTIVITY SEEN AS CAUSE OF EARTHQUAKES

The recent severe earthquakes felt in California and Montana, and the mountain slide in Wyoming have aroused interest in the theory of Prof. J. Joly, English geologist, on radioactivity as the possible cause of quakes. It is a well known fact that throughout the entire earth's crust minute quantities of radioactive elements exist, mainly thorium and uranium, which are constantly producing heat by breaking down at a rate quite independent of the pressure and temperature found in the outer parts of the earth. The granites which are in the outer layer of the earth's crist contain approximately three times as much of these radioactive elements as the basaltic layer which is deeper, and this latter is twice as rich as the denser and more basic layer of peridotites.

Continents are essentially composed of granite embedded in a sub-stratum of basaltic composition. This has a lower melting point than the granite, and increases in volume about ten per cent at its melting temperature. And since the basaltic layer is self-heating due to its radioactivity, Prof. Joly states that it lacks only the latent heat of fusion to become fluid, and further, that at the present rate of disintegration it must again become fluid in about thirty million years. When this expansion has reached its greatest point the surface crust is correspondingly raised and increased in area about 650,000 square miles. The surface tension becomes so great that continents and ocean floors are split apart. Tidal action starts a slow westerly drift of the still solid continents and the superheated substratum which originally lay beneath a continent now comes to lie beneath the ocean floor which melts away from below until the increasingly rapid loss of heat from the ocean checks and finally ends the process.

The reverse action now begins. Crystallization in the liquid basaltic layer takes place, the vastly increased land area contracts and settles down into the solidifying substratum and the margins of the continents especially are marked by intense compression, producing immense depressions and upheavals. This in brief is the cycle whereby the excessive heat due to radioactivity is accumulated and lost, during which succeeding cycles the ancient Eurasian ranges and the fairly recent Himalayas and Pacific ranges have been thrown up during the different geologic epochs. That such a cycle is nearing completion in the Pacific region is known, due to current observations on the steady sinking of the ocean floor and

the regularity of the temblors most of which are so slight as to be recorded only by the seismograph, but which occur regularly every ten or fifteen minutes.

When asked for his opinion of this idea of the origin of earthquakes, Commander N. H. Heck, chief of the Division of Terrestrial Magnetism and Seismology of the U. S. Coast & Geodetic Survey, stated:

"It is, of course, only one of the hypotheses that have been advanced to explain earthquakes. I do not feel that we are yet in a position to place a great amount of weight in any of them, that is, as to the actual cause of the earthquake. We know pretty well how an earthquake occurs, but it is not yet certain which of the several hypotheses that have been advanced best accounts for the stresses which cause the earthquake.

"It is quite possible that a number of different elements, such as the processes of erosion and deposition, the radioactivity , as mentioned, and other causes within the earth work together to produce the stress, while the trigger forces that set off the earthquake may come either from within or from without the earth."

MORE MEN SUICIDES THAN WOMEN

"Suicide, in the wage-earning group of American and Canadian populations, is approximately two and one half times as frequent among men as among women", says the Statistical Bulletin of the Metropolitan Life Insurance Company, based on a study of 16,000,000 industrial policyholders.

This ratio, it is stated, relates to all ages combined, but the proportion varies according to age. Between 15 and 20 suicide is more common among girls, but between 20 and 24, the men show the greater deathrate, about one and a half times as many men as women. Between 55 and 64, there are about five times as many men, and after 65 about seven times asmany.

Solid and liquid poisons are preferred by women up to 45 years, and after that gas inhalation; while among the males shooting is most generally used. It is also stated that among men there is a marked relation between the suicide rate and business condition, the greater number of deaths occurring after a dull period, but that among women there is no such relation.

SCIENTISTS COUNT BACTERIA ON "ROASTIN' EARS"

There is no getting away from bacteria, for there are at least 30,001 on each kernel of fresh corn, 30,000 ordinary ones that are easily killed, and one "thermophile", or heat resisting organism not afraid to boil, according to experiments conducted in a canning plant for the U. S. Bureau of Chemistry by Lawrence H. James, government bacteriologist.

Fresh hand husked corn has at least four times as many bacteria on it as maching husked, and these increase about fifteen times when the corn is cut and passed through sifting screens. However, after the corn was packed in brine and preheated to 185 degrees in the sterilization process, only one per cent of the ordinary bacteria remained alive and ten per cent of the more stubborn ones.

THE AUSTRALIAN CRAWL APPLIED TO MOTOR-BOATS

A motor-boat propeller which uses somewhat the same principle as the crawl stroke in swimming to drive the boat through the water is the latest invention reported from Vienna. The unusual apparatus is the work of an air pilot, Major Franz Blicharski, and is applicable not only to water craft, but also to aeroplanes and dirigibles.

The propellers consist of a pair of double fins mounted on a horizontal shaft in the same position as a screw propeller. They do not rotate, as in the type of screw propeller in common use; but rather oscillate, in somewhat the same manner as the fins of a fish, or better, suggestive of the kick-stroke of the racing crawl. The advantage claimed is that the oscillating type propellers give a greater surface pressure, per unit, than do the screw type, producing a "dynamic" instead of a "mechanic" propulsion. The oscillation is obtained by a gearing between the engine and the propellers.

This greater surface pressure from the propelling unit allows for a reduced expenditure of power from the engine, and hence a distinct saving of power and fuel, or a considerable increase in speed. The tests which have been made with a motor boat show that it can gain some five per cent. more speed with the same fuel consumption and power unit as used before the installation of the oscillating propellers, it is claimed. No tests have yet been made with aeroplanes, but a model has shown very hopeful results.

The twin propeller fins, set one after the other, oscillate in opposite directions, the fins assuming a certain angle in the water according to the speed at which they oscillate. To reverse the motion of the boat, the propeller fins can be turned on their longitudinal axes to opposite positions.

PARISIANS MEASURE HEAT OF HATS

During a recent heat wave in Paris, one newspaper called attention to an investi investigation held some years ago by a group of scientists to ascertain the best type of hat for summer wear. All experiments were made at a temperature of 97 degrees Fahrenheit. The sporting cap came out the loser, with a heat beneath it of 98.6 degrees; the derby was next hottest, registering 92 degrees; the felt hat showed only 86 degrees; and the stiff straw 79 degrees. But the panama wins, with a heat of only 77 degrees, and is recommended to the public for the greatest comfort. The odd part is that panamas are much rarer in Paris than in New York, though they can be had cheaper.

FRANCE TO SALVAGE FISH REFUSE

A project for making a new food product from the large quantities of fish refuse left daily at Boulogne-sur-Mer by great fishing fleets has been patented in France and rights have been obtained for the United States, according to a consular report. Heretofore this refuse was carted away by representatives of fertilizer manufacturers who obtained it without payment, but now a large canning and packing concern is interested in making an extract out of it resembling that of beef.

ALL INDUSTRIES HAZARDOUS SAYS COMMITTEE ON BLINDNESS

That there is hardly an industrial occupation in America which does not add each year to the steadily increasing number of the blind and near blind is the announcement made by the National Committee for the Prevention of Blindness, following an extensive study of eye hazards in industry.

Referring to the records of a single insurance company which in three and a half years settled claims involving 1049 cases of permanent disability resulting from eye injuries, the committee found that 82 eyes were lost in the presumably safe occupations of merchandising, farming, and textile manufacture.

"This is further proof," the committee reports, "that serious eye accidents are likely to occur wherever men, women, and children are employed. There is no such thing as a really non-hazardous occupation."

The report shows that the greatest number of serious eye injuries for the entire country occur in the metal manufacturing industries. But in Pennsylvania the coal mining industry ranks first as a cause of industrial blindness, and in Wisconsin hand tools are the greatest single cause of injuries to eyesight.

One large shipbuilding company had more than 4,300 eye cases treated in its dispensary in one year.

The committee recommends the keeping of detailed and accurate records of the nature, causes, and costs of eye injuries as the first step in any campaign for the prevention of eye accidents in an industrial plant or in an entire industry.

CEMENT KILNS USE HEAT FORMERLY WASTED

Tremendously hot gases, from cement kilns, formerly discharged into the air and wasted, are now utilized by manufacturers, and a saving of 775,000 tons of coal a year has resulted.

Discharge into the air of hot gases from powdered coal combustion in the kilns is a waste of heat which portland cement manufacturers have long sought to eliminate, but practical means of utilizing this lost energy has appeared only in the last decade.

Temperatures in the kilns range from 2500 to 3000 degrees, and the gases emerge, after heating the ingredients of cement to melting point, at about 1300 degrees Fahrenheit. Formerly this heat merely went up the chimney, but now some forty-three of the 140 American portland cement plantsuse this excess to make steam which in many cases supplies all the power needed in their mills.

One of the most popular articles of food of the delicatessen variety in the Philippine Islands is balut, half-hatched ducks' eggs, boiled in the shell.

Montana produces more high grade manganese ore, used in the manufacture of steel and other products, than all other states in the United States put together.

U. S. USES SALT MORE SPARINGLY

Did you use one hundred and twenty pounds of salt last year? If not, you did not get your share for according to the Bureau of Mines there were 6,803,115 short tons of this necessary substance used or sold by producers in the United States in 1924. Even then Americans used salt more sparingly for in the year before the allowance per person was about one hundred and twenty-seven pounds. Over a third of all this salt is in the form of brine and the rest is evaporated and rock salt. New York, Michigan, and Ohio produce nearly four-fifths of all the salt in the United States, and Kansas, Louisiana and California practically all the rest.

TABLOID BOOK REVIEW

METEORS, by CharlesP. Olivier, Ph. D., 276 pp., Baltimore, Williams & Wilkins Co., 1925, $6.00.

Despite the great advances in astronomy in recent years and the host of books dealing with the various branches of the science, meteoric astronomy has been strangely neglected. No general book has appeared on the subject since 1871, a fact which is all the more surprising when we consider that, as far as is known, meteors are the only objects from outside space that ever come into actual contact with the earth. The author of this work, which ably fills the gap, is one of the leading authorities on this subject, and the organizer and guiding spirit of the American Meteor Society, an organization of amateurs for the study of these celestial visitors. He writes with a style that commends itself alike to the astronomer and layman who is interested in knowing a little more of the universe around him.

OILDOM,ITS TREASURES AND TRAGEDIES, by Oscar H. Reinholt. National Publishing Co., Washington, $1.25.

Romance and cold facts of every angle of the oil business are graphically portrayed by simply worded explanations, pictures, diagrams, and tables of figures. The author states that his main purpose in writing the book was to "provide intelligent investors with means for their own protection against misadventure in oil".

A new ship of 6,300 tons, the first vessel built of the new material known as elastic limit steel, had been launched in England.

The latest kinks in the science of chicken picking have been introduced into a revised edition of a U. S. Department of Agriculture circular on "How To Pick Chickens".

A laboratory of glass technology has been established at the University of Pittsburgh.
