

PUBLIC HEALTH

Typhoid Fever Increase Due To Low Sanitary Funds

TYPHOID fever is increasing all over the nation. More typhoid fever cases have been reported to the U. S. Public Health Service in the last four weeks than were reported at corresponding times in the last four years. Health officials think it may be due to certain laxity in sanitary procedures as a result of decreased state and municipal appropriations for such purposes.

For the week ending August 13, there were 1,243 cases reported. For the week ending August 6, there were 1,119 cases, while during the corresponding period last year there were only 996. July 30 of this year there were 1,091 cases, and 908 in 1931. July 23 there were 1,294 cases, as against 751 the preceding year. Health officials think the peak may have been reached on August 13, although the case reports are expected to run rather high between now and September 15. The peak of the usual seasonal increase in the disease occurs between the middle of August and the middle of September. Either the peak has been reached earlier than usual this year or the number of cases will go still higher.

Typhoid fever is now one of the preventable diseases. It was originally brought under control by sanitary measures, such as proper sewage disposal, purification of water supplies, pasteurization of milk, and supervision, as far as possible, of typhoid carriers. One attack of typhoid fever makes a person immune to subsequent infection, and this immunity may now be given by a course of inoculations with killed typhoid germs. The United States Public Health Service, however, warns that this individual immunization cannot take the place of organized sanitary control and prevention.

Science News Letter, August 27, 1932

ASTRONOMY

Eclipse Shadow Bands Successfully Photographed

SHADOW BANDS were photographed in at least two instances during the total solar eclipse of Jan. 24, 1925. This note corrects a statement that they have never been photographed (*SNL, July 30, '32, XX, p. 72*). Prof. W. L. Eikenberry of State Teachers College, Trenton, N. J., calls

attention to his report (*Science, LXI, p. 566, May 29, 1925*) of a photograph made by Glenn Lowry, Stroudsburg, Pa., photographer. Prof. Harlan T. Stetson, in *Scientific Monthly, XXI, p. 664, Dec., 1925*, describes shadow band photographs made by a Harvard College Observatory expedition. Prof. W. H. Pickering of Harvard nearly fifty years ago produced artificial shadow bands using a search light. An Italian expedition photographed the bands of another eclipse.

On the map of eclipse path (*SNL, July 30, '32, p. 69*) read 1 min. 38 sec. instead of 1 min. 30 sec. for the period of totality at 3.30 P. M.

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CHEMISTRY

Spoilage of Frying Fat Due to Water in Food

WHEN the baker finds that the fat in which he has been frying his doughnuts begins to give an objectionable taste to the food, it is not alone because of the high temperature at which he has been keeping the fat. He must also blame the water present in the doughnuts.

This conclusion was reached by F. R. Porter, H. Michaelis, and F. G. Shay, of the Edison General Electric Appliance Co., who have studied this cause of loss to the baker.

When the equipment used by bakers and chefs was smaller, this breaking down of fat, which necessitates throwing it away, was not so important because in the usual gas-heated fry kettle only about 10 to 15 kilograms or about five dollars' worth was discarded weekly. Now, however, modern equipment holds 130 to 180 kilograms and the waste is consequently considerable.

The chemists who studied the problem made experiments both in the laboratory and in a bakery under actual bakery conditions. They found that high temperature alone would not produce much breakdown of the fat. The breaking down involved the formation of acid and was the direct result of a reaction with water while hot. Besides the acid, glycerol is formed, and this in turn changes into water and acrolein, which burns the eyes and is most unpleasant to smell and taste.

The amount of acid present in the fat is a good index to whether it will give the objectionable taste to the food; the disagreeable flavor appears at about 4.4 per cent. acid.

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IN SCIENCE

SEISMOLOGY

Quake In Interior China May Prove Major Disaster

THOUSANDS of lives may have been lost in an earthquake which occurred at about noon on Sunday, August 14, (Chinese time) in the interior of China; although news of the disaster may be delayed weeks and months in being reported to the outside world.

An earthquake shock of at least moderate severity was registered on seismographs throughout the world at 11:39 1/2 p. m., Eastern Standard Time, Saturday night. Through data wired to Science Service and interpreted by the U. S. Coast and Geodetic Survey, it was found that the center of the disturbance was located in the Yunnan province of the Chinese interior at approximately 27 degrees north latitude and 103 degrees east longitude.

This is an earthquake region and there are many inhabitants. It is a part of China known for its sliding mountains and it is probable that many lives were lost.

It is south of the Kansu region of China, in which destructive earthquakes occurred in 1920 and 1927. The 1920 quake caused 500,000 deaths. The 1927 quake was flashed to the world as a probable major disaster by Science Service's earthquake reporting service two months before the news from the locality reached telegraph lines.

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RADIO-ASTRONOMY

Radio Compasses to Detect Eclipse Effect on Broadcasts

RADIO compass observations to determine changes in the direction of radio broadcasting signals before, during and after the total eclipse of the sun, August 31, will be made by Dr. Ernest Merritt, head of the department of physics at Cornell University. His expedition will be located at Whitefield, N. H., and several radio compasses will be trained on broadcasting stations with and without the path of the moon's shadow.

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E FIELDS

METEOROLOGY-ASTRONOMY

Weather During Eclipse Recorded At Many Points

EXTENSIVE observations of the weather during the total solar eclipse of August 31 are planned by Dr. Charles F. Brooks, director of the Blue Hill Observatory of Harvard University. About twelve stations within the path of the shadow will be occupied, including one on the summit of Mt. Washington, 6,288 feet high.

Sensitive barographs to measure pressure of the atmosphere, thermographs to measure temperature, hygographs to measure humidity, and anemographs to measure wind velocities and directions will be in automatic operation during eclipse and for several hours before and after eclipse.

A total solar eclipse has been described as a kind of laboratory experiment in which are eliminated practically all influences upon the atmosphere except that of a fall in temperature.

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PHYSICS

New Isotopes Predicted With Neutrons as "Bricks"

COBALT of atomic weight 57, manganese of atomic weight 53, and vanadium of atomic weight 49 are predicted by Dr. James H. Bartlett, Jr., young American physicist and fellow of the National Research Council, through the use of a new theory of atomic structure in which neutrons and protons only are used as building blocks of the nucleus.

The normal atomic weights of cobalt, manganese and vanadium of the sorts now known are 59, 55, and 51 respectively. Atoms of different weight but having identical chemical behavior are known as isotopes.

Dr. Bartlett, whose home is in Quincy, Mass., announced his research in a letter to *Nature*.

The neutron was identified as an entity only a few months ago. It is a close combination of an electron and a proton. Older theories of atomic struc-

ture considered the hearts of atoms as built of protons and free electrons but the discovery of the neutron has led to the theory that electrons occur within the nucleus only as parts of neutrons. Starting with a helium nucleus and adding alternately a neutron and a proton, Dr. Bartlett obtains all the elements in the chemical table up to oxygen of atomic weight 16, namely, lithium 6 and 7, beryllium 8 and 9, boron 10 and 11, carbon 12 and 13, and nitrogen 14 and 15. Beyond oxygen, owing to a change in the arrangement of the "bricks" within the inner shell (two neutrons being more stable in the central field than a neutron and a proton) the order of addition becomes: neutron, neutron, proton, proton, and repeat. This gives oxygen 17 and 18, fluorine 19, neon 20, 21 and 22, sodium 23, magnesium 24, 25, 26, etc.

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GENETICS

New Tomato Variety Started From Tumor

POSSIBILITIES of new varieties of plants being originated from tumorous growths purposely induced are held out by results of an experiment reported in *Science* by Dr. Dontcho Kostoff of the Leningrad Academy of Sciences and Dr. James Kendall of New York City College.

Experimenters had noticed abnormalities in the internal structures of cells in plant tumors caused by the microorganism *Bacterium tumefaciens*. They were of a kind that often goes with the production of new varieties.

Drs. Kostoff and Kendall therefore deliberately set about producing tumorous tomato plants by injecting the bacteria into the stems. When the tumors developed, they cut the stems off just above them, to induce the formation of new sprouts. Some of these sprouts arose from the tumors, and part of them displayed the cellular abnormalities they sought for. By cutting off these tumor-formed sprouts and rooting them in soil, they were able to obtain independently-growing plants entirely of tumorous origin.

The new plants do not differ greatly from the parent stock. They resemble it closely in stems and leaves, but the flowers are a little larger. However, the experiment is regarded as significant because it points the way toward a new method of inducing the development of new plant varieties.

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CHEMISTRY

Nearly All of Coal Changed Into Oils and Solubles

TWO University of Washington chemists, Prof. W. L. Beuschlein and Dr. C. C. Wright, do not fear a shortage of gasoline and oil when the world supply of petroleum is exhausted, for they have found that as much as 80 to 90 per cent. of coal can be converted into oil and other soluble products.

In Germany, where coal is more plentiful than petroleum, gasoline is already made from the solid fuel by the hydrogenation process. The present low cost of petroleum in this country makes the application of such a process here seem remote.

Prof. Beuschlein and Dr. Wright used different coals from Alabama, West Virginia, Kentucky, Illinois, Pennsylvania, Utah and Washington. The best coals gave the highest yields of oil, but even with the inferior lignites, or brown coals, about one-third of the coal was converted into soluble products.

Their work, which was made possible by a grant of the National Research Council, is chiefly of value now in the classification of coals.

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EUGENICS

Italian Melting-Pot Works; Men Are Becoming Taller

SIGNOR MUSSOLINI may never be able to review whole brigades of six-foot grenadiers, such as used to delight the military eye of the father of Frederick the Great; nevertheless the troops who salute him today are taller than those who fought for Italian liberation in the seventies. The increasing height of Italian men during the past half-century was one of the points brought out in a statistical study presented at the meeting of the Third International Congress of Eugenics in New York, by Prof. Marcello Boldrini of the Catholic University of Milan. Italians are not only becoming taller, but the height of the male population is becoming more uniform.

Prof. Boldrini ascribed this result partly to the complete blending of the three diverse racial stocks that constituted the original population of Italy, partly to better economic conditions in the country during the recent past.

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