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INFANTILE PARALYSIS

CLUES for predicting where infantile paralysis outbreaks are likely to occur in the summer are pointed out by Dr. C. C. Dauer, epidemiologist of the Health Department of the District of Columbia. Dr. Dauer suggests in a report in the current issue of Public Health Reports, issued by the U. S. Public Health Service, that the clues point to a possible outbreak of the disease in Virginia this coming summer.

The epidemics may not always come off as predicted. The clues which foretell the possibility are found in the number of infantile paralysis cases occurring in a given locality in the late fall and early winter. Dr. Dauer finds from examining epidemic records as far back as the big 1916 infantile paralysis epidemic, when 27,363 cases were reported from 27 states, that when there are a relatively large number of cases in a community at such a season, that community and surrounding area is likely to have a severe outbreak the following summer.

Although no preventive of infantile paralysis has yet been discovered, Dr. Dauer suggests that the possibility of predicting where summer epidemics may come will give investigators a chance to test any preventive measures that may be devised and to carry on valuable preliminary studies on the epidemiology and immunology of the disease. The records show, he says, that "several counties in eastern Kentucky and western West Virginia which had a high incidence in the fall of 1939 appear to have been the focus from which the infection spread to the surrounding area in the summer of 1940. Likewise, the small group of counties in Iowa which reported poliomyelitis in larger numbers than usual in the fall and winter of 1939–1940, appear to have been the center from which the epidemic in that area may have spread the following summer. Several counties in northern Wisconsin reported a number of cases late in the fall of 1939 and a considerable number in January and February of 1940. In the summer of 1940 the disease began to appear first in the area comprising these counties and in the counties of the upper peninsula of Michigan immediately after. Such occurrences as described above are not unusual since several similar instances are to be found in the past decade."

As to this coming summer, Dr. Dauer points out that: "In the state of Virginia poliomyelitis cases were reported in larger numbers than usual during the months of November and December of 1940. Most of these late cases were reported from counties in the southwestern part of the state. It will be interesting to see if this instance of occurrence of the disease in this locality in the late fall will be the forerunner of a more wide-spread outbreak in Virginia and the surrounding area in the summer of 1941."—JANE STAFFORD.

THE DIAGNOSIS OF CANCER

HOPE that a new chemical instrument, the polarograph, might be of value for the diagnosis of cancer has faded, according to a paper presented at the meeting in Cleveland of the Electrochemical Society. The report on the instrument, which gives a rapid and accurate test for tiny amounts of chemicals, was made by Drs. T. Klatt, H. P. Rusch, A. Dirksen and V. W. Meloche, of the department of medicine and the department of chemistry of the University of Wisconsin.

The instrument was invented by Professor J. Heyrovsky, of the University of Prague. It has been used in Europe for several years, but only recently has come into use in this country. Describing the instrument at the recent meeting of the American Chemical Society, Dr. Alois Langer, of the Westinghouse Research Laboratories, who had worked with Professor Heyrovsky, explained that it is capable of measuring chemicals in billionths of ounces, by recording tiny electric currents passing through the solutions being tested. With it problems can be solved in minutes that would require hours by the older methods.

The use of the polarograph is to measure small amounts of copper in a solution as other chemicals are gradually added to remove portions of the copper. Essential parts of the apparatus are a reservoir of mercury, a small storage battery and various electric meters. The mercury is fed through a tiny glass nozzle, in tiny droplets no larger than the head of a pin, into the solution being tested.

"When electric voltage from the battery is applied to the solution," said Dr. Langer, "a chemical change takes place on the surface of the mercury drop that is about to leave the nozzle. A new drop is formed every few seconds to maintain a clean surface for the chemical action. To measure the amount of copper in the solution, we set the electric voltage at the specified amount for that substance, as we would tune in a radio to a certain station. Then we read a dial which tells the amount of electric current passing through the solution, thus indicating the amount of copper it contains."

It was explained that a solution that contains many substances may be analyzed by "tuning in" the voltages which correspond with the various substances and reading the electric currents. Earlier studies had seemed to hold out the prospect that the polarograph might be valuable in cancer diagnosis. However, studies on blood sera from cancerous rats, mice and human beings gave discordant and overlapping results, leading to the conclusion that the device "can not be used as a specific test for cancer, especially in the presence of other diseases. As a test to distinguish between an advanced carcinoma and a normal the polarographic method is entirely sensitive and accurate, but as an aid to differentiate between other diseases and cancer, between early stages and normalcy, and between the malignant and the benign, and this is where the need lies, one can not help but conclude that the polarograph is quite limited."

In other fields, according to Dr. Langer, the instrument has great possibilities in simplifying the work. He suggested that after further study, it might be used to measure hormones and other body fluids and vitamins in such foods as orange juice and milk.

THE VIRUS OF INFLUENZA

THE disease-causing unit of the virus of influenza is only an eighth or perhaps a tenth the size previously believed, although that was much too small to be seen with powerful microscopes.

The diameter of each disease-causing unit of influenza virus is 10 millimicrons or less, Dr. Leslie A. Chambers and Dr. Werner Henle, of the University of Pennsylvania School of Medicine, conclude from measurements reported at the meeting in Chicago of the Federation of American Societies for Experimental Biology.

A millimicron is a millionth part of a millimeter, which in turn is only three hundredths of an inch long.

Since it was not possible to see such tiny particles, they were measured in various indirect ways by using powerful centrifuges that separate particles of known size from still smaller ones, studying the speed with which particles move through a liquid and checking the calculated measurements with the electron-microscope. Although this instrument will show particles as small as 20 millimicrons in diameter, it did not show the influenza virus particles. The eight or ten times larger particles which had been thought previously to be the individual units of the flu virus are now believed to be normal components of body cells which carry the tiny virus particles.

Not only influenza virus but a virus used to make smallpox vaccine and another virus commonly found in the brains of mice are also much smaller than previously supposed and are probably carried on the larger particles which were believed to be the virus particles themselves. This was discovered by Dr. Jaques Bourdillon, also of the University of Pennsylvania, in studies of the rate at which viruses moved through a solution. The smaller particles believed to be the real viruses move more rapidly, he found, than the larger, carrier particles.

TRAINING FOR PSYCHOLOGISTS

AN urgent appeal for intensified professional training for future psychologists able to deal with problems outside the schoolroom was presented to his colleagues by Dr. Walter S. Hunter, of Brown University, speaking on April 17 as president of the Eastern Psychological Association, which met at Brooklyn College on April 18 and 19.

Pressing social problems demand both scientific ability and general experience and wisdom, he said. "If a psychologist were given the problem of devising the best form of illumination for night driving which would at the same time favor the driver and handicap an airplane observer the solution could only come from a careful study of the application of scientific knowledge to the particular conditions specified. If, on the other hand, the task were one of raising the general level of group morale, wisdom and experience would count for as much as scientific knowledge."

With the increased demand for social service, professional training should be made more rigorous, not relaxed. Students of psychology should intensify their study of other sciences so that later they can work with physicists, chemists, or biologists on problems which involve these fields. Specialization, as in medicine and engineering, should come only after a mastery of the fundamentals of the science. Interneships for psychologists who have their doctor's degree, like those for medical doctors, should be provided. Such opportunities for supervised practice of psychology are important for those who intend to work outside of research and teaching.

Dr. Hunter pointed out that "There is a crying need for the establishment by a few of the larger universities of professional schools for psychology where men and women can be trained for non-academic work in industry, child clinics and mental hospitals." Undergraduate students in psychology at the better universities are already receiving broad scientific training. Examination of students beginning their work for advanced degrees showed that those training in psychology have a better balanced undergraduate training than either physicists or chemists. For instance they know more about biology than any other group except the biologists themselves.

ORIGIN OF "LO-HAN"

"LO-HAN," a widely used Chinese drug of hitherto mysterious origin, has finally been traced to its origin, and has proved to be a new plant species, and given a name of its own, by Dr. Walter T. Swingle, of the U. S. Department of Agriculture.

The drug, widely used in China and in Chinese communities in this country as a household remedy for colds, sore throat and minor digestive upsets, is a kind of gourd, cured by heating over a slow fire. Its pulp, intensely sweet, is used in making a kind of sweet soup, not palatable to most Occidentals. The fruits command a high price—about 20 cents apiece in Chinatown stores in this country.

An expedition sponsored by the National Geographic Society finally traced the lo-han to its lair. It is not grown by Chinese, but by a primitive people known as the Miao, in the rainy mountainous interior province of Kwangsi.

The lo-han fruits are produced by vines, of which only the ones bearing female flowers are cultivated. The Miao, primitive though they are, have learned how to hand-pollinate the female flowers with male flowers gathered wild in the woods. They sell about a thousand tons of the fruits annually to Chinese merchants, for transport to the coast cities and for shipment abroad. The flowers are described as an inch and a half or more in diameter, with yellow corollas. The fruits, when fresh, are greenish yellow or dull reddish brown, ranging from hen's-egg to goose-egg size.

The plant has been identified as a member of a large genus that ranges throughout the Old-World warm lands, known as *Momordica*. Dr. Swingle has named the new species *Momordica Grosvenori*, in honor of Dr. Gilbert Grosvenor, president of the National Geographic Society, who, he states, "for many years has encouraged liberally the geographic and botanical exploration of China." The new name and a technical description are published in the *Journal* of the Arnold Arboretum of Harvard University.

THE MEXICAN EARTHQUAKE

THE earthquake in the City of Colima, in Mexico, on April 15 was first noticed in the United States by interference with the testing of electrical apparatus by Dr. Frank Wenner and his aides, which the National Bureau of Standards was doing for the Army Signal Corps.

About 2:20, the delicately balanced mirrors on three large galvanometers began to swing abnormally, and kept it up for more than an hour. Dr. Wenner knew that a violent earthquake was going on somewhere, and judged from the behavior of his instruments that it might be in Mexico. Not until hours later did belated wire reports bring confirmation.

The earthquake may have set off the reported eruption of Colima volcano, in the opinion of Dr. Emanuel G. Zies, volcanologist of the Carnegie Institution of Washington. This volcano is the westernmost of a string of such peaks that mark a high ridge running in an approximately east-west line across Mexico, and joining the coastal range at this point. It is one of the most active mountain-forming regions according to Dr. Zies, so that stimulation of an eruption by an earthquake might well occur. Ordinarily earthquakes and volcanic eruptions have little to do with each other, despite a wide-spread impression to the contrary.

The epicenter of the earthquake was about 75 miles southeast of the City of Colima, was reported by the U. S. Coast and Geodetic Survey, after a study of data wired and radioed to Science Service by a number of observatories ranging from Ottawa to Manila. The spot of greatest disturbance was provisionally fixed as in latitude 18.5 degrees north, longitude 102.9 degrees west. This is in an isolated mountainous region in the state of Michoacan. The exact time of origin was 2:09.8 P.M., E.S.T.

Observatories reporting were those of the University of Alaska at College, Alaska; the University of Hawaii at Honolulu; Manila Observatory, Manila, P. I.; the Dominion Observatory, Ottawa; Pennsylvania State College; Georgetown University, Washington, D. C.; the Franklin Institute in Philadelphia; the University of Michigan at Ann Arbor, and the stations of the U. S. Coast and Geodetic Survey at Tucson, Ariz., and Ukiah, Calif.

"PINE OATS" FOR CATTLE

FINLAND'S forests are being called on to make good the country's present shortage in cattle feed, in the production of an emergency ration known as "pine oats." The product is claimed to be quite successful.

"Pine oats" is made by a modification of the ordinary process for producing soda paper pulp. The wood is chipped into small pieces, which are cooked in a pressure kettle with a soda solution. The cooking is kept up longer, and at higher pressure and temperature, than is the case with ordinary paper pulp. The longer it is cooked, the more digestible is the final product. After cooking, the pulp is watered down to the consistency of thin gruel, washed free of sand and twigs, and spread on screen trays to be drained of water and dried in an oven. Then it is chopped into fine bits, about the size of oat grains, and stored until needed.

Cattle fed on an experimental diet consisting exclusively of "pine oats" got along all right, but gave little milk. For regular feeding, a cow is given a daily ration of 6½ pounds of "pine oats," 6½ pounds of hay and a third of a pound of mineral salts. Current production of the new feed is 500 tons a day.

Finnish chemical engineers are also undertaking the large-scale production of sugar from wood. This sugar is not quite as sweet as beet sugar, but is said to be quite satisfactory in making preserves, jams and similar products. Two wood-sugar factories are now under construction.

ITEMS

THE American Institute of Nutrition was requested at its meeing in Chicago to plan a diet for the Belgian people consisting of inexpensive foods which could be sent to them to counteract malnutrition. That anti-rickets vitamin D, morale vitamin B_1, vitamin A and bone-building calcium were scarce in the Belgian diet even before the German invasion, was reported by Dr. Lucien Brouha, now at the Harvard University Fatigue Laboratory. The Belgian pre-war diet was also overloaded with carbohydrates, it was found in a survey made at the request of the Ministry of Public Health of Belgium in the fall of 1939 by the National Council of Nutrition, of which Dr. Brouha was a member.

A NOVEL type of steam locomotive, with two small cylinders in a V-type mounting to turn each drive wheel instead of the two single big cylinders on each side coupled to all the drive wheels with a connecting-rod, has just been granted U. S. patent 2,237,728. Thus, an engine with four drive wheels would have eight cylinders on a side, two above each wheel. In effect, each pair of wheels connected by its axle constitutes a separate, four-cylinder engine. The inventor is a German, Ulrich Barske, of Kassel-Harleshausen, who has assigned his patent rights to the firm of Henschel und Sohn, of Kassel.

INTENSIVE vitamin therapy used on patients suffering from polyneuritis caused by alcoholism does not allow the patient to leave the hospital any sooner than treatment with the routine hospital diet that contains adequate but not excessive vitamins, according to a study of eighteen years of experience by Dr. Madelaine R. Brown, of the Boston City Hospital, who reported the results to the *Journal* of the American Medical Association. Alcoholics suffering from the painful disease did not seem to be able to utilize more vitamins than are adequate in the case of a healthy person.

THE death rate from lockjaw (tetanus) was cut to half of the accepted 50 per cent. or higher mortality rate cited in medical literature in a series of a hundred cases reported in the *Journal* of the American Medical Association by the late Dr. Hyman I. Vener and Dr. Albert G. Bower, of Los Angeles. Not considering 12 patients who died within the first 24 hours of hospitalization, the net mortality rate was 19.3 per cent. Antitoxin and methenamine were used in the treatment. The reduction in mortality rate occurred wholly among men patients, the rate for women remaining approximately 50 per cent.