

CHEMISTRY

New Anti-Bacterial

Chlorellin, substance akin to penicillin in its action, discovered in a lowly green water plant. Still far from mass production and practical medical use.

► THE PENICILLIN family of germ-discouraging compounds secreted by the lowlier representatives of the plant kingdom has a new member named chlorellin, which is unique in that it is the first of the group to be found in a green plant able to manufacture its own food out of natural raw materials. All previously discovered compounds, including penicillin, are made by molds, soil bacteria, and other plants that have to be supplied with ready-made foods in the form of glucose solutions or the like.

This point promises to be of extremely great significance if it is found practicable to use chlorellin for medical purposes. All the producing plants need is water, a few assorted mineral salts, and a supply of carbon dioxide bubbled through the tanks in which they grow.

Announcement of chlorellin's advent is made in *Science* (April 28), by a group of twelve scientists who have been at work on the problem for a year and a half.

The producing organism is a very common one-celled fresh-water alga known as *Chlorella*; whence the compound's name. The investigating scientists used cultures of two species of this lowly plant, *Chlorella vulgaris* and *Chlorella pyrenoidosa*. After growing masses of the cells in five-gallon tanks, they filtered off the plants and treated the water chemically to extract whatever compound might have been left in it. In its crude-extract condition, chlorellin

is a brown stuff, sometimes tacky and gummy, sometimes hard and brittle.

Tried out in solution on test cultures of several kinds of bacteria, chlorellin produced effects very much like those of penicillin, checking the growth of such organisms as streptococcus and staphylococcus. The researchers even suggest that chlorellin may actually kill the germs, whereas the utmost that has ever been claimed for penicillin and related compounds is that they are bacteriostatic; that is, that they check growth and weaken the germs, making it possible for other agencies (usually the white blood corpuscles) to finish them off.

The investigators make it plain that chlorellin is still far from the point of large-scale production and practical use in medicine. The extracts thus far obtained are crude, and the concentration in the plants' growth water is thin and uneven. A great deal of additional research is still needed, they emphasize.

The communication in *Science* is signed by Robertson Pratt, T. C. Daniels, John J. Eiler, J. B. Gunnison, W. D. Kumler, John F. Oneto and Louis A. Strait, all of the University of California's college of pharmacy, and by H. A. Spoehr, G. J. Hardin, H. W. Milner, J. H. C. Smith and H. H. Strain, of the Carnegie Institution of Washington's division of plant biology, with laboratories at Stanford University.

Science News Letter, May 6, 1944

MEDICINE

For High Blood Pressure

Vitamin K will be tried as possible remedy for humans. Proves effective, in rather large doses, in experiments on rats.

► VITAMIN K, the anti-bleeding vitamin, will be tried as a possible remedy for high blood pressure, it appears from a report by Dr. Henry Schwarz and Dr. William M. Ziegler, of the Philadelphia Institute for Medical Research,

Philadelphia General Hospital, to the Society for Experimental Biology and Medicine.

The trials follow success in use of the vitamin to reduce experimentally induced high blood pressure in rats. In these



SPARK BARRAGE—This welder is using an oxy-acetylene torch to work on one of the big steam lines for Westinghouse roving Power Trains, which will be used to restore electric service in cities reconquered from the Axis by United Nations armies. Each eight-car train is capable of generating 5,000 kilowatts.

animals the systolic blood pressure fell the first day after injection of the vitamin from about 170 to 140 and continued to go down under the vitamin treatment to a low of 120. The figures are the average for nine experiments. The animals were given a vitamin injection daily. When the vitamin was stopped, blood pressures immediately rose, the average figure reaching a high of 180.

Rather large doses of vitamin K had to be given the rats to achieve these effects, the scientists report, pointing out that in any trial of the vitamin treatment on humans much larger doses may have to be given than those used for treatment of vitamin K deficiency. The next step will be to determine how much vitamin K must be given to reduce blood pressure in humans and whether that amount can safely be given.

The idea of using vitamin K as a high blood pressure remedy came from work reported by several other groups of scientists. It all hinges on the fact that vitamin K is the kind of chemical compound known as a quinone. This work showed that the high blood pressure resulting from inadequate blood supply to the kidneys might be due to a defect in breaking down amino acids.

This leads to an accumulation of substances called pressure amines which do

not accumulate under normal conditions when the tissues are supplied with oxygen via the blood stream. Normally such amines are rapidly destroyed by an enzyme, amino oxidase. They may also be inactivated by certain quinones which previous experiments suggested may have blood-pressure reducing qualities in rats with high pressures. The blood pressure lowering material found in the body and liver oils of fish is also believed to be a quinone.

With this background, the Philadelphia scientists decided to try another quinone, vitamin K, in rats with high

blood pressure resulting from insufficient blood supply to the kidneys.

Vitamin K is widely distributed in nature, among its richest sources being green leaves of different kinds, such as spinach and cabbage among food plants. A number of synthetic chemicals with vitamin K activity have been prepared and are available commercially. The anti-bleeding action of the vitamin is due to its part in the formation of prothrombin, first in a chain of substances essential for the clotting of blood when it is shed.

Science News Letter, May 6, 1944

Mr. Geisse does not believe that the development of the private airplane and its power plant will follow the pattern of gradual refinement of present designs. Nor does he feel that all the new developments will come from well-equipped and staffed laboratories.

"I expect," Mr. Geisse said, "that in the future as in the past much of the real development of the personal plane will be brought about by individuals with unorthodox ideas who have the stamina to stick to their ideas through hell and high water until they have proved that they were right."

Science News Letter, May 6, 1944

DENTISTRY

Chill Jaw To Kill Pain

Refrigeration may take the place of currently used drugs as a local pain-killer in dentistry. Proves effective in 15 out of 22 cases tried.

► REFRIGERATION of the jaw may replace currently used drugs as a local pain-killer in dentistry, it appears from trials reported by Lt. Comdr. J. S. Restarski, of the U. S. Naval Medical Research Center, Bethesda, Md. (*Journal, American Dental Association, May*)

Sixteen sailors and WAVES volunteered for the experiments, in which 22 cavities were filled under local refrigeration at the near-freezing temperature of one or two degrees Centigrade. Preliminary studies with animals had demonstrated that no damage to tissues of the jaw occurred as a result of such chilling. In 15 instances, complete anesthesia or loss of sensation was obtained, while in seven a mild degree of pain was experienced.

To prevent pain caused by abrupt temperature changes, a means of gradually lowering the temperature was devised. Room-temperature refrigerant, placed in the circuit between the refrigerating unit and the metal gum applicators, was replaced by degrees with cold refrigerant as a centrifugal pump circulated the solution.

Only those cases in which pain on drilling recurred after refrigeration was discontinued were included in the study, in order to be sure the pain would have been present if the area had not been chilled.

"These preliminary findings are very encouraging," Dr. Restarski declares, "but trials on a large number of patients of all ages are needed to determine the effectiveness, limitations and

practicability of this type of local anesthesia in dentistry."

The suggestion for using refrigeration as a local anesthesia in dental work came from George Chaydeane, an air-conditioning engineer. He and Comdr. A. P. Black, of the Navy Medical Corps, conducted the initial studies in 1937 and Comdr. Black suggested the further investigation reported.

Science News Letter, May 6, 1944

AERONAUTICS

2-Cycle Engine Suggested For Private Airplanes

► NO AIRPLANE engine suitable for the post-war private market is now available, declared J. H. Geisse of the U. S. Civil Aeronautics Administration at the National Light Aircraft meeting of the Institute of Aeronautical Sciences in Detroit. It is necessary that either engine design be so simplified that engines can be produced cheaply in relatively small quantities or they must be produced in quantities exceeding any probable demand for personal airplane use, he said.

Research work is needed in the development of a suitable power plant and, he emphasized, it should certainly include work on two-cycle engines because of their simplicity. It would be a boon to private flying, he added, if such research developed an engine that would have increased power without greater fuel consumption.

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