

PHARMACOLOGY—CHEMISTRY

Drug May Save Hearts

► ANTI-DIABETES drugs taken by mouth are under investigation for protecting diabetics against heart trouble, it was reported at the American Chemical Society meeting in Chicago.

Oral anti-diabetes drugs decreased cholesterol synthesis in rat liver, Dr. Hugh J. McDonald of Loyola University, Chicago, said. High levels of cholesterol in the blood are believed by some to be responsible for the development of atherosclerosis, he explained.

It cannot be definitely established that the oral anti-diabetes drugs lower the levels of blood cholesterol in diabetics and protect them from atherosclerosis without extensive clinical studies, Dr. McDonald cautioned. The findings with the rat liver tissue are only preliminary, he said.

The anti-diabetes drugs cannot be used against atherosclerosis in non-diabetics, in spite of the extreme importance of this medical problem, because the drugs cause a drastic lowering of blood sugar levels. It is quite possible, however, he added, that the findings will point the way to the development of drugs that would be effective against atherosclerosis without affecting blood sugar levels. Such drugs might be used in non-diabetic patients.

The effects on cholesterol synthesis of oral agents now available to the public have not previously been reported. In fact it had even been suspected that the drugs might be helping the patient's diabetic condition, but at the same time exposing him to the bad effects of increased blood cholesterol levels, Dr. McDonald said.

Market names of the drugs being tested are orinase, debinase and DBI.

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Plant Tissue Culture

► THE FIRST tissue culture ever to be obtained from plant pollen provides valuable information on tissue formation and growth, it was announced at the American Chemical Society meeting in Chicago.

The pollen is from the Maidenhair tree, or *Ginkgo biloba*.

Requirements for plant growth can be more easily studied in this isolated homogeneous culture, Dr. Walter R. Tulecke, Boyce Thompson Institute, Yonkers, N. Y., said and will lead to a better understanding of how plant cells use their food supply.

It has been discovered, for instance, that the tissue uses the important amino acid, arginine, essential to all living cells, in a different way than animal cells. It was also found that sugar is rapidly utilized by the tissue, that citric acid predominates among the acids present, and that the tissue stores nutrient solution in which it is growing by secreting amino acids into it.

Knowing the medium and tissue composition during rapid tissue growth will also permit "a more rational approach to controlled growth," Dr. Tulecke said.

At the present time no metabolic products of the tissue are of commercial value, but similar methods applied to other tissues from higher plants might lead to the synthesis of compounds of some value, Dr. Tulecke concluded.

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Organisms Eat Waste

► DRUG-EATING organisms are solving a serious disposal problem, scientists were told at the American Chemical Society meeting in Chicago.

The disposal of the liquid process wastes from the manufacture of antibiotics such as penicillin has created a major problem since World War II, Dr. Ross E. McKinney of the University of Kansas said. The wastes are 20 to 40 times as concentrated as domestic sewage.

A new method has now been developed using microorganisms that can eliminate the wastes in a single stage process, Dr. McKinney reported. This is the first biological waste treatment process to be designed from the microbiological viewpoint, he said.

Previous methods using microorganisms, called activated sludge methods, did not have oxygen transfer equipment that could meet the oxygen demand in the aeration tank. The new process distributes the organic wastes over the entire aeration tank so that there is no high oxygen demand rate as in conventional activated sludge.

"Mathematical equations have been developed which permit accurate design of the complete mixing activated sludge systems. These equations permit the engineer to know what results to expect before the plant is put into operation and to evaluate operation problems which may arise," Dr. McKinney concluded.

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New Anesthetic

► AN ANESTHETIC which does not cause unstable heart rhythm or sharp drop in blood pressure was announced at the American Chemical Society meeting in Chicago.

The anesthetic, methoxyflurane, reduces the need for post-operative narcotics and minimizes possibilities of over-dosage, Dr. Eric R. Larsen, Dow Chemical Company, said. It is compatible with nearly all drugs commonly used in surgery and can be applied with conventional anesthesia apparatus without modifications or special attachments.

First prepared in Great Britain in 1940, methoxyflurane remained a laboratory curiosity because of the impurities which made it unstable. A method recently developed to remove the impurities provides a compound with a shelf life of several years, Dr. Larsen reported.

The physiological action of methoxyflurane is similar to diethyl ether, a commonly

used anesthetic, but unlike ether it does not form explosive peroxides on long exposure to oxygen, hence the unusual stability, Dr. Larsen explained. It is also considerably more stable to light than chloroform and halothane.

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Meat Flavor to Order

► SAWDUST can taste like steak when chemists put the flavor in it, the American Chemical Society meeting was told in Chicago.

The flavor in meat is caused by simple chemical compounds that can be reproduced and placed in foods before cooking to produce a mouth-watering meat flavor at will, Dr. Wendell A. Landmann of the American Meat Institute Foundation, Chicago, reported.

Meat has been separated into water-soluble materials, fat and water-insoluble materials, Dr. Landmann explained. After heating these fractions, the scientist found the meat flavor and aroma only in the water-soluble material.

Further separation of this material showed that the fundamental meat flavor could be produced from two compounds, inosinic acid and a protein that contained sugar. These compounds in themselves have no odor, but when these are mixed and heated with fat or water, the odor and taste of broiled or boiled meat is obtained, he said.

"The housewife will be able to tailor meat flavor to suit individual tastes of her family and she can be sure of uniform flavor quality when she purchases a steak," Dr. Landmann said. Applications to space-feeding and to the synthetic foods for future populations are also being explored, he concluded.

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BIOLOGY

Algae Could Provide Oxygen for Spaceman

► MINUTE PLANT LIFE that form the common green scum found on the surface of stagnant ponds and in river beds, *Chlorella* algae, assisted by the sun, may provide the future man in space with the oxygen essential to maintain life.

A new gas exchange device operating on the principle of photosynthesis was designed and demonstrated by Lt. Col. John B. Fulton of the U.S. Air Force Arctic Aero-medical Laboratory, Fairbanks, Alaska.

The algae using the energy of the sun convert the carbon dioxide exhaled by the astronaut into oxygen which is breathed in and exhaled again as carbon dioxide, the process being repeated indefinitely.

One of the major problems still to be solved for survival in space is the continuous supply of oxygen and this photosynthetic gas exchanger, which differs from other models in employing direct sunlight, is an important advance and will most probably be used in future space flights.

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