SCIENCE NEWS

ARTIFICIAL FAT FOR DIABETES

Science Service

THE invention of a new form of artificial fat that can be digested by diabetic patients was announced on August 3 by Dr. Max Kahn at a meeting of the medical staff of the Beth Israel Hospital, New York.

At that hospital feeding with the new fat has given relief in thirty cases of acidosis due to diabetes. One man was carried into the hospital for the purpose of having his leg amputated since it was attacked with gangrene. But after the artificial fat had been added to his diet the acidosis was stopped, the sores healed up and four weeks later the man walked out of the hospital on his own two legs.

Dr. Kahn, who has charge of biological chemistry in the College of Physicians and Surgeons of Columbia University and of diseases of metabolism at the Beth Israel Hospital, has been working for a year and a half to make a fat that would not break down into acid products as do natural fats in cases of diabetes. From recent researches in the chemistry of nutrition he came to the conclusion that a fat with an odd number of carbon atoms would serve the purpose. But such a fat could not be found in nature so it had to be made to order.

The investigations to simplify the method of manufacture and the carrying through of the design of the plant apparatus and installation of equipment have been conducted by Professor Ralph H. McKee, professor of chemical engineering, Columbia University, in his private laboratory, and required the services of two assistants for six months. It was through this investigation that the process has been simplified so that instead of material costing $300 or even $100 a pound, it can now be made in a factory and sold for $8 a pound, and probably this cost will decrease still more once production is well under way. A pound will last a patient from a week to three weeks.

A manufacturing plant has been built in Long Island City, and last week 200 pounds of the new product was turned out. It has been named "intarvin," meaning "intermediate fat," because the molecule contains 17 carbon atoms and is therefore intermediate in composition between the ordinary fats carrying 16 and 18 carbon atoms.

Intarvin is a white crumby substance, tasting something like tallow, but is not so soft. It is either eaten straight or mixed with a little tasteless mineral oil or made up into a mayonnaise or shaken up with buttermilk or baked in gluten bread. The diabetic patients find the new fat quite eatable and it satisfies the craving for fat common in the disease.

It is a curious coincidence that within the year 1922 two remedies, insulin and intarvin, have been invented for diabetes, which, though one of the most common and serious of diseases, has hitherto baffled medical skill. Insulin, which was discovered by Dr. F. G. Banting, of Toronto University, is an extract of animal pancreas which when injected into the veins restores temporarily the power to assimilate sugar. Intarvin is a synthetic fat which is assimilable by diabetics in whom natural fats produce an excess of acid. Neither insulin nor intarvin is regarded at present as a permanent cure for diabetes, but both restore temporarily the digestive powers, the former for sugars, the latter for fats, but each increases somewhat the ability to handle the other type of food.

GLUCOKININ AS A SUBSTITUTE FOR INSULIN

Science Service

DISCOVERY of "glucokinin," derived from plants and appearing to have the properties of insulin, is described by J. J. Willaman, associate professor of biochemistry in the University of Minnesota, in a statement made public by the American Chemical Society.

Recent discoveries in this field establish one more profound relationship between plants and animals, says Professor Willaman, who reports successful use of glucokinin on diabetic dogs and rabbits. Clinical tests as yet have not been made on human beings.

Things are changing fast in the diabetic world, continues Professor Willaman. It was just a year ago that a group of scientists at the University of Toronto announced that they had prepared an extract of pancreas which, when injected into dogs, would cause a lowering of the sugar content of the blood.

Since then the extract has been used successfully in the case of human diabetes at several clinics, and has been manufactured commercially. Now the announcement is made that the active principle has been demonstrated in plant tissue, including lettuce, bean leaves and the onion.

Dr. J. B. Collip, formerly one of the Toronto University group who first made insulin, and now at the University of Alberta, conceived the idea that, since injection of "insulin" enables the animal to burn sugar and store up glycogen, those plants and lower animals which contain glycogen might also contain this active principle.

Glycogen is "animal starch," and is abundant in clams, oysters, yeast and mushrooms. He tried clam tissue, and had no trouble whatever in preparing an extract which helped rabbits and dogs to burn sugar. Yeast, however, proved a stumbling block. He tried over twenty different methods before he found one that would produce an active extract. After that he could prepare very active materials at will.

Next he tried green leaves of lettuce and wheat, and then the bulb of an onion. In all cases he demonstrated the presence of a substance which apparently had all the properties of "insulin." He doesn't give it the latter name, however, but prefers to call it "glucokinin."

LIGHT TESTS TO DETECT CULTIVATED PEARLS

Science Service

DR. FRED E. WRIGHT, of the Geophysical Laboratory of the Carnegie Institution of Washington, has thrown light, literally, on natural pearls and cultivated pearls, and now they can be told apart.

There are now three kinds of genuine pearls. Most valuable are the "natural" or "normal" pearls found by divers the world over. "Blisters" or baroque pearls, not nearly so beautiful or expensive as the "natural" article, have been for years produced simply by inserting a foreign body in the producing oyster. But recently a Japanese, Dr. K. Mikimoto, succeeded in developing a patented method for inducing pearl oysters to grow pearls which are spherical in shape and similar in external appearance to fine "natural" pearls. Mikimoto's cultivated pearls are now on the market, and pearl merchants and jewelers have had difficulty in distinguishing them from the natural article.

His process is to remove a pearl oyster from its shell, cut a patch off its outer, shell-secreting mantle large enough to enclose, as a sac tied at the neck, a bead of mother-of-pearl or even an inferior pearl. This bead is imbedded in another live oyster, which, after proper treatment of the wound, is returned to its native habitat where in the course of a few years a coating of pearl may be deposited around the inserted bead.

Dr. Wright's methods for detecting the presence of such a bead of mother-of-pearl depends on the fact that the layers of the natural pearl and the mother-of-pearl nucleus reflect light differently. One method of finding the cultivated pearl, he explained, is to stand with your back to the window, sun or other strong source of light, and hold the pearl so that it is illuminated by the light. When the pearl is rotated on a string, the characteristic sheen of the mother-of-pearl can be clearly seen shining out from inside the pearl when the pearl is in certain positions.

Another method of distinguishing the fine pearl from the cultivated one consists in placing it on a thin sheet of metal directly over a small hole drilled through the metal. The hole serves as an opening through which a beam of strong light passes. The only light that reaches the observer comes through the pearl and shows the shadow of any foreign nucleus which may be in the pearl.

When a small real pearl is used as the center of a larger cultivated pearl, this nucleus can be discovered by an examination of the hole drilled through the pearl for stringing it. A boundary between the nucleus and the outer pearl substance is seen with the aid of a tiny mirror and a microscope. The mirror is made by holding the end of a fine gold wire in a Bunsen flame for a time sufficient to melt down the tip and form a small bead, which presents a smooth and excellent reflecting surface. This wire with the tiny mirror on the end is inserted into the hole in the pearl which is illuminated by a strong light from the side and the reflections from the bead are observed through a low power microscope.

THE ORIGIN OF ANTHRACITE

Science Service

INVENTION of a method for the determination of the structure of anthracite coal and incidentally for the positive identification of coal seams has been announced by H. G. Turner, assistant professor of geology at Lehigh University. The method makes certain for the first time the vegetable origin of anthracite coal.

Although geologists have been fairly sure that hard coal was formed like soft coal from plants which grew in remote geologic ages there was no direct confirmation of their surmises until Professor Turner announced his invention. Soft coal had been sliced into minute sections thin enough for light to pass through and had been subjected to a microscopic examination which showed definitely its vegetable origin, but this method had been impossible for use with anthracite because no matter how thin it was cut it was still absolutely opaque.

Professor Turner found that by first giving the surface of the coal a fine polish, then drying it thoroughly at a temperature somewhat less than red heat, and then heating the polished surface in the flame of the blowpipe or Bunsen burner to a dull red heat for a few minutes it was possible to see through a microscope the structural details of the coal. The final heating burned away some of the coal, leaving a sort of skeletonized surface or etching. This was then observed through the microscope by a beam of light reflected from it, showing with great fidelity the structural details.

Photographs have been taken which show absolutely the vegetable origin of the coal. Some pieces resemble fragments of modern woods such as the maple or pine, while others show a pithy structure like bamboo or weeds, but unlike most of the trees of the present day. Spores of the great tree ferns of the far away days when the coal beds were being formed have also been found.

An interesting part of the discovery lies in the fact that in most of the samples there has been no deformation of the cell structure such as would be caused by great pressure. Geologists have thought that hard coal was formed by the heating of soft coal under pressure. Professor Turner's results do not confirm this theory in so far as pressure is concerned. There is evidence that the coal has been heated, but none that it has been compressed.

A practical application of Professor Turner's invention is expected to be in the new means for identification of different coal beds. Operators lease particular beds for mining, and it sometimes happens that through twisting, breaking or pushing up or down of strata, there is much doubt and confusion as to just which bed belongs to which company. Professor Turner has found that the coal from different beds has marked differences of structure, having been formed from plants which while of the same geologic epoch grew perhaps at intervals of thousands of years, during which the earlier beds were covered with deposits of rock. In case of doubt as to ownership all that will now be necessary will be to subject the coal to microscopic examination.