NEW HAZARD

This is what happened when the first explosion occurred in a soybean industrial plant.

MEDICINE

Germinated Barley Yields Diabetes Remedy Like Insulin

A SUBSTANCE akin to insulin, which may prove useful not only in diabetes but also in helping to gain weight, has been obtained from germinated barley by two French scientists, Drs. E. Donard and H. Labbé of the Faculty of Medicine of Paris.

Insulinoide of germinated barley — I. G. B. for short — is the name Dr. Labbé gives the substance in his report. (*Canadian Medical Association Journal*, Feb.)

Valuable as insulin is, Dr. Labbé points out, it has certain disadvantages and can only be used under the careful guidance of a physician. For this reason, almost as soon as insulin had been discovered scientists tried to find whether certain vegetable cells, like those of the animal pancreas, had the power to secrete substances with properties like those of insulin but which would at the same time be "less dangerous to apply and easier to manipulate."

One of the first to work on this problem was Prof. J. B. Collip of McGill University, Montreal, who discovered a "glucokinine hormone" in vegetable tissues. Other investigators tried the effects of various plant extracts, among them whortleberry tea and bean pod extract.

The barley insulinoide prepared by Drs. Donard and Labbé has been tried on animals and human patients by themselves and by colleagues at the Hospital Saint-Louis of Paris. In diabetes the preparation reduces the high sugar content of the blood and relieves other symptoms, Dr. Labbé reports. Its use, he states, seems to be absolutely justified for fattening cures for underweight people.

"Of course," he adds, "only long experience will tell if, while being much less dangerous to handle than insulin, insulinoides and particularly the I.G.B. will produce gently and continuously the desired effects on the recovery of the general nutrition."

CHEMICAL ENGINEERING

Soybean Explosions New Industrial Hazard

THE SOYBEAN is repeatedly in the limelight these days.

What with the United States growing a bumper crop of the Asiatic beans, and farmers and industrial companies launching out into new projects to make the most of them, the soybean situation is, as the market journals might say, "lively."

But with new opportunities, appears a new hazard: soybean plant explosions.

Last October 7, without warning, came the first explosion in a soybean industrial plant. Eleven men died, 45 were injured, when a Chicago processing plant handling 4,000 bushels of soybeans a day was badly wrecked. So violent was the explosion that approximately 500 homes and business houses were damaged by flying debris and by the shock.

Within the same month, a rural soybean unit in Illinois suffered a similar disaster. This soybean oil extraction plant had been installed to enable farmers of the community to utilize their soybean crop to better advantage. A swift, disastrous chain of events—fire, ignited solvent vapors, explosion—left two men dead and two injured.

Before this second explosion occurred, chemical engineers of the Bureau of Chemistry and Soils of the U. S. Department of Agriculture had already gone into action. Dr. David J. Price, the department's chief investigator of these problems, and his assistant, Hylton R. Brown, inspected the ruins, and gave their verdict:

Caused by Hexane

Both disasters, judging by the ruins, started when hexane vapors became ignited. Hexane is a flammable liquid used as a solvent in extracting the soybean oil. In the industrial plant an accumulation of the explosive hexane gas was ignited by a minor dust explosion near a flaking roll in the bean preparation room. In the rural unit the heavy hexane vapors settling in the extraction room apparently were carried over through an open door to the fire in a nearby boiler room and were ignited in the fire box.

Dr. Price believes in preventive treatment for such disasters. He is busy now warning farmers and manufacturers in the soybean industry to follow the safety codes for protecting against other explosive dusts. (*Turn to Next Page*)

Dr. Price also urges that non-flammable solvents be sought, to replace liquids such as hexane, the vapors of which ignite easily. If flammable stuff must be used, then he advises some instrument must be evolved to ring an alarm or speed up fans when vapors begin to escape in dangerous concentrations.

"We don't want to discourage the installation of plants for soybean processing," says Dr. Price. "We do want to urge 'safety first.'

"There appears to be rapid advancement in methods for extracting oil from soybeans. And since soybeans can be used in so many processed products—from ice cream cones to rabbit feed, and from glue to plastics—the problem of explosions in soybean plants will obviously have to be met, not avoided."

Science News Letter, February 22, 1936

CHEMICAL ENGINEERING

Sandy Soil Turned Solid by Injection of Chemicals

TURNING porous sandy soil into solid rocklike material with the texture of medium hard sandstone is the latest technique by which European chemists are now strengthening subway tunnels, improving hazardous foundations of buildings, plugging leaks in the beds of streams of valuable mineral springs and restoring underwater dams.

The system, known as the Joosten process of soil solidification, consists of injecting into the soil two chemical solutions which combine to form a gel-like material.

The gel material has a high surface tension and acts to draw the sand particles closely together. Loads of 1,100 pounds to the square inch are successfully withstood by the artificially solidified sandy soil.

Applications of the new method are many. The Cathedral Church of Ribe in Jutland rested on closely packed chunks of rock lying on a bed of fine sand. In the course of years, and due in part to increasing nearby motor truck traffic, the foundations subsided and cracks appeared in the masonry.

Menace Removed

Underpinning the walls with girders was deemed inadequate. It was decided to widen the foundation by means of chemical solidification in the underlying sand layer. The operation was so successful that the menace to the cathedral structure no longer exists.

In connection with recent construction on London's subway system the method was also tried successfully. Injection pipes for the chemicals were driven through the planking used to line the finished part of the tunnel. A chemically solidified arch of smooth gravel was formed in the tunnel's roof. When it came time to cut away parts of the roof which projected into the tunnel profile, pneumatic chisels had to be used because of the strength of the material.

Moreover, the process has been used to plug leaks in a stream of valuable medicinal waters at Teplice-Sanov in Czecho-Slovakia near the Austrian border. The stream bed consisted of sand and silt lying on top of a sandstone layer. Cracks developed in the sandstone and the valuable waters were leaking away.

By putting down injection pipes the chemicals were turned into the sand and silt and brought about successful solidification.

Two Chemicals

The two solidifying chemicals are reported to be silicic acid, which is put into the sandy soil first, and an unnamed salt solution that immediately reacts with the silicic acid to form an insoluble colloidal silicic acid gel. For successful operation a careful study must be made of the soil type and use confined to sandy layers. The technique will not work for clay or mud.

The process of the solidification of sandy soil by the injection into it of two chemicals may find usefulness in the movement for improvement of the secondary, "farm-to-market" roads of the United States, officials of the Highway Research Board in Washington, D. C., indicated when they were told of the German experiments.

The methods of keeping roads in sandy soil from water erosion in wet weather and wind erosion in dry weather are ever-present problems. If research in America can confirm the claim that the sandy soil can be turned into a solid material like medium hard sandstone, the technique should be useful. The question of cost, now undetermined, would be a necessary consideration.

Science News Letter, February 22, 1936

GENERAL SCIENCE

New Buildings For Soviet Academy of Sciences

CONSTRUCTION of the new buildings of the U.S.S.R. Academy of Sciences will be started this year. A total of nearly 500 acres of land will be needed. Plans just announced indicate that the buildings will be erected on a huge scale.

Largest building and center of the group will be built on an area of 83 acres. Here will be located the Presidium of the Academy, and the departments of Social, Mathematical and Natural Sciences. Also included will be all museums and the Central Library.

Living quarters for the scientific workers will occupy 35 acres while a neighboring plot for the genetic and physical sciences will cover 67 acres.

The chemical, biological and the genetics institutes, the publishing house of the Academy and more staff dwellings will occupy an area of 270 acres.

Science News Letter, February 22, 1936

CHARLES MARTIN HALL

When he was only 22 years old, he discovered the process for making aluminum.