MEDICINE

Abandoned Drug Is Antidote For Sleeping Powder Poison

Overdoses of Veronal and Luminal Are Counteracted By Powder From "Fish Berries" of East India

AN ANTIDOTE for otherwise fatal poisoning from overdoses of commonly used luminal, veronal and related sleeping powders has been found in picrotoxin, a drug formerly much in vogue but little used in recent years.

Two human cases in which the new treatment proved its worth and animal experiments leading to its use were reported by Drs. T. Koppanyi, J. M. Dille and C. R. Linegar, Georgetown University Medical School, to the American Association for the Advancement of Science.

Physicians will soon be able to use this new treatment in rescuing from death those who inadvertently or with suicidal intent take large doses of the barbiturate sleeping powders.

The patients on whom the new antidote was first used were both elderly persons, a man and a woman, patients of Georgetown physicians, Drs. Wm. S. Murphy and Connolly. The woman had taken luminal, the man amytal, both in very large doses, and both patients were absolutely paralyzed from the overdose of sleeping powder. The woman responded very favorably to picrotoxin, Dr. Koppanyi reported. She came out of collapse, began to move, eat, drink and even to talk, though not coherently. Unfortunately, she died of lung infections which had set in before the picrotoxin treatment had been started. Blood tests, however, showed that the amount of luminal in her body was progressively decreasing in relation to the improvement in symptoms noted following the picrotoxin treatment.

Man Seen Early

The man was fortunately seen very soon after he had taken the overdose of amytal. Picrotoxin treatment was started immediately and continued for two days. The patient progressively improved and after a final fairly large dose of picrotoxin suddenly showed what Dr. Koppanyi calls the "awakening effect of picrotoxin," began to move about, asked rational questions and from then on made an uneventful and complete recovery.

Picrotoxin, the substance which promises to save victims of overdoses of modern sleeping powders, is not suitable for treating all cases of poisoning due to narcotics, Dr. Koppanyi warned. In morphine poisoning, for example, picrotoxin produces no "awakening effect" and tends to make the condition of the subject worse. Before starting this treatment, the physician should find out whether the poisoning is due to sleeping powders like veronal or amytal, Dr. Koppanyi advised. This may be learned either from the history of the case or by performing the Koppanyi test for these compounds.

Picrotoxin is a bitter-tasting, white crystalline powder found in the famed fish berries of East India, where it got its name from the fact that the natives used it to poison fish. It is a powerful stimulant and formerly was an official drug in the U. S. and British Pharmacopoeias. In former times it was almost without exception put to the wrong use, Dr. Koppanyi explained, being used then to treat epilepsy and St. Vitus' dance, conditions characterized by convulsions which picrotoxin itself has a tendency to produce. It was therefore taken out of the pharmacopoeias and discarded as a useless remedy.

Wisconsin Research

Merit for rescuing it from oblivion and suggesting its new use as an antidote for a certain type of poisoning belongs to Dr. A. L. Tatum and associates of the University of Wisconsin, Dr. Koppanyi declared. These investigators first showed that picrotoxin shortened the recovery time of animals poisoned by the veronal group of sleeping powders.

Dr. Koppanyi and associates showed among other things that very large doses of picrotoxin may be necessary to counteract the effect of the veronal-amytal type of sleeping powder. In very severe poisonings it is necessary to give one animal a dose of picrotoxin large enough to cause convulsions in 300 normal animals. Yet the poisoned animals are so depressed by the sleeping powder that they hardly show any twitches under these terrific doses of picrotoxin. This shows not only that picrotoxin is an effective antidote but that it is safe to use in these cases.

Even more dramatic than its life-saving effect is the "awakening effect" of picrotoxin, Dr. Koppanyi said. At the meeting, he showed moving pictures of animals to demonstrate this. These animals were poisoned not by very large doses of the sleeping podwers, but had had enough to produce deep sleep and unconsciousness. They were lying perfectly helpless on the floor. When moderate doses of picrotoxin were injected, they suddenly awoke and began to move about in lively fashion.

Tests also showed that picrotoxin in some cases actually increases the rate at which amytal and similar sleeping powders are destroyed in the body.

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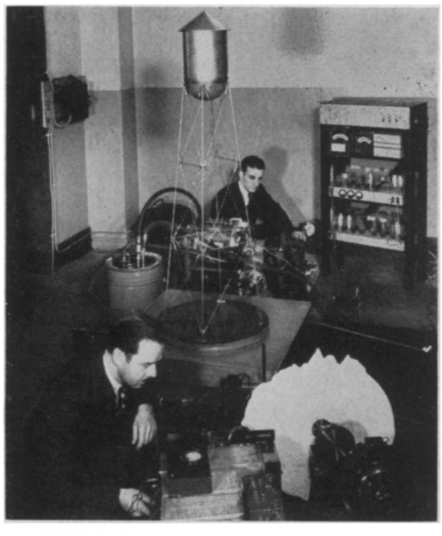
SEISMOLOGY

Earthquakes Reproduced With "Electric Eye"

ENGINEERS now have a new weapon with which to combat one of their most powerful enemies—the earthquake. A machine devised at the



DUPLICATES EARTHQUAKES

This machine makes it possible for the first time to duplicate in the laboratory the motions of destructive quakes directly from seismograph records. In the foreground Arthur C. Ruge, research associate, who designed the machine, is adjusting the optical system and electrical "thinking" device, which has an electric eye that follows the wavy outline of the shadowgraph of an earthquake record. The white shadowgraph shown here is a seismograph record of the Long Beach, Calif., quake of 1933.

Massachusetts Institute of Technology, and described before the meeting of the Seismological Society of America by Arthur C. Ruge of the Institute staff, makes it possible for them to reproduce at will, on a small scale, all the wracking movements of any earthquake that has been recorded on a seismograph. Models of buildings, set on this machine, are given a chance to display points of strength and weakness, and the engineers can turn the knowledge they thus obtain to account in perfecting the resistance of their structures to the thrusts and pulls of an unruly earth.

Machines constructed for this purpose in the past have not been able to follow the actual movements of an earthquake at all accurately, due largely to imperfect control mechanisms. Mr. Ruge's device consists essentially of an electro-magnetic control over a valve, that in turn determines the rate and amplitude of motion of an oil-driven piston moving the shaking table. The current that operates the control is increased and diminished by a photo-electric cell, or "electric eye," in response to a controlling cam cut out of paper, in the exact shape of the earthquake's record curves. A spot of light constantly "watches" the irregular edge of the cam.

Since each historic earthquake has its own characteristic shape and record, any earthquake can be called back at will and made to dance again in the Institute laboratory, simply by cutting out a shadowgraph of its record.

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BACTERIOLOGY

Find New Form of TB "Germ" In Breeding Experiments

ARTIFICIAL breeding experiments with the tuberculosis "germ" which resulted in the discovery of a new form of this bacillus and shed fresh light on the disease were reported to the Society of American Bacteriologists by Drs. Ralph R. Mellon, Philip J. Almaden and Ruth D. Richardson of the Western Pennsylvania Hospital's Institute of Pathology, Pittsburgh. Dr. Mellon is also director of the medical research affiliate of the Mellon Institute, which sponsored this work.

The new organism produces in experimental animals a kind of reaction not produced by conventional forms of the tubercle bacillus. This kind of reaction is known technically as non-caseating, meaning that the tissue is not killed en masse by the infection. Since this tissue-killing is one characteristic of the disease, its absence has made diagnosis difficult and uncertain in some cases, Dr. Mellon explained.

"Preliminary studies already conducted in suitable patients have illuminated these uncertainties for the first time," he said, "and to an extent that gives promise of still wider application of this knowledge."

Another of the unique and important characteristics of the new bacillus is the fact that it is either non-pathogenic or produces a benign form of the disease in highly susceptible animals. This suggests that in part, at least, resistance to tuberculosis may be acquired by people as a result of infection with the newly-discovered organism rather than from repeated infection with small amounts of the usual disease-producing form, as has been previously supposed.

The breeding of this new tuberculosis "germ" may aid diagnosis of the disease in still another way, it appears from the report of the Pittsburgh investigators. This new organism can produce a tuberculin that is different from the tuberculin produced by the human, bovine or avian bacillus. Tuberculin is a chemical product of the tuberculosis "germ" specific for this organism and used for diagnosis of the disease.

"It becomes distinctly possible that patients reacting to the new type of tuberculin still have a form of tuberculosis not detectable perhaps with the old type," Dr. Mellon said.

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PHYSIOLOGY

Turnips Found Effective As "Carrier" for Iodine

WE MAY all soon be eating turnips as a means of getting goiter-preventing iodine into our systems, just as we now eat spinach for the vitamins it contains. Or if we live in the South, we may combine the two benefits in a dish of turnip greens.

At the meeting of the American Association for the Advancement of Science, Dr. Warren B. Mack told of experiments with many kinds of vegetables, to see which would make best use of iodine applied with fertilizer to the soil. He found turnips to be most efficient, increasing their iodine content more than a hundred-fold when plenty of that necessary element was available in the soil.

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CHEMISTRY

Chemistry Aids Farmers In Many Varied Fields

CHEMISTS are the farmer's allies in a long series of activities, many of which would hardly be guessed at by the uninitiated, Dr. Henry G. Knight, chief of the bureau of chemistry and soils, U. S. Department of Agriculture, indicated in his annual report.

Chemical research for the improvement of fertilizers, and for the better understanding of legume-crops' fixation of nitrogen from the air, chemical work toward the improvement of poison sprays to kill off insect pests and fungus diseases—these are obvious points of contact between chemical science and agriculture. But even more numerous, Dr. Knight's report shows, are chemistry's good offices in finding new uses for agricultural products, and in improving old ones. Alpha cellulose from cornstalks, gas for lighting and heating from barnyard wastes, industrial solvents from by-products of corn processing, are only a few of the possibilities on which research is actively in progress at the present time. An investigation into the color of apples turned up a piece of basic information that may be of use in the seemingly remote field of corn breeding. Studies of enzymes have application in such dollars-and-cents matters as tanning of hides and storage of eggs.

The list is long, and might be longer, Dr. Knight emphasizes, if we only had more basic chemical knowledge to apply to immediate problems. For this reason he stresses the need not only for applied chemistry but for fundamental research in "pure" chemistry—which is never far from application, once its results come into the clear.

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About 98 per cent. of the cashew nuts sold in this country come from India.