

MEDICINE—PHYSIOLOGY

New Morphine Substitutes May Aid Addiction Control

Biologists Meeting in Baltimore Discuss Cancer Treatments, Birth Control, Insulin Against Alcohol, Remedy for Burns

TWO NEW possible substitutes for morphine which may prove able to free man from the poppy's curse, drug addiction, were announced by Dr. Nathan B. Eddy of the University of Michigan at the recent Baltimore meeting of the Federation of American Societies for Experimental Biology.

The new substances are: 1. methyl-dihydromorphinone, a substance derived from morphine; and 2. a synthetic chemical made from carbazole, a coal tar product.

The promising substance derived from morphine, methyl-dihydromorphinone, has been given to relieve pain in place of morphine, to between 800 and 900 patients at hospitals of the Massachusetts State Department of Health, hospitals of the U. S. Public Health Service and at clinics in Ann Arbor. Because the conditions from which these patients suffer vary so greatly, it is difficult to arrive at an exact knowledge of the new drug's value.

Encouraging from the standpoint of the fight on drug addiction is the report that it is not necessary to increase the dose of this new drug. The same amount continues to relieve pain after many doses have been given as was effective in the first dose.

Still Somewhat Toxic

The synthetic drug derived from carbazole controls pain as well as codeine does, but it is rather toxic. The chemists think they can remove the part of the synthetic drug that produces these toxic or poison symptoms without reducing its pain relieving property. This drug has not yet been tried on man, so no one knows yet whether or not it is habit-forming.

The work Dr. Eddy described is part of a nine-year fight against drug addiction waged by armies of chemists, pharmacologists and other scientists under the auspices of the National Research Council. Their aim has been to find the perfect non-habit-forming substitute for morphine. A summary of the

accomplishments and efforts of these years will shortly be published by the U. S. Public Health Service, which is one of the organizations taking part in the work. The method of this research has been to study the chemical constituents of morphine, to learn if possible which ones could relieve pain, which ones were poisonous and which ones were habit-forming, and then to remove the undesirable ones from morphine or change them so as to make them inactive, or else to make a completely new drug out of the desirable chemical constituents.

Cyclotron Against Cancer

Artificial radioactivity may replace the surgeon's knife and other methods of treating cancers of the thyroid gland and simple goiters due to overgrowth of the tissue of that gland in the neck. This future application of one of latest triumphs of modern physics appears in research reported by Drs. Saul Hertz and Arthur Roberts of Harvard Medical School.

Application of artificial radioactivity to the conquest of cancer is one of the aims of the atom-smashing experiments being conducted by physicists on a wide front. One of the difficulties with the use of radium and X-rays is that of getting the cancer-destroying rays into the cancerous tissue without harming other healthy tissues. Radium needles, million-volt X-ray machines and elaborate ray-screening methods have been developed in the hope of overcoming this difficulty. Since some chemicals have the knack of making their way to certain parts or tissues of the body and depositing there, the physicists hope that by giving these radioactivity, they may have a way of getting the cancer-destroying rays right into the tissues where they are needed. The research of the Harvard medical scientists is one of the first forecasts that the physicists' aim will be accomplished.

Iodine is one of the substances that can be made radioactive by the cyclotron,

giant atom-smashing apparatus. When this radioactive iodine is injected into a vein, almost all of it makes its way into the thyroid gland. This was discovered by injections of radioactive iodine into the veins of rabbits and presumably would be true in the case of humans as well.

Radioactive iodine in the thyroid gland should act like radium needles or seeds, giving off beta rays that can destroy cancer and check overgrowth of other cells. When greater supplies of radioactive iodine can be made, it should be possible to use this potent material in treating human patients.

Birth Control Improvement

A discovery which brings birth control by the "safe period" or rhythm method an important step nearer to being universally practicable appears in research reported by Drs. Fred D'Amour, Dorothy Funk and Helen Liverman of the University of Denver.

The research also promises a means of overcoming sterility in some cases and thus enabling many women to fulfill their dream of motherhood.

The "safe period" or period of infertility could be determined for each individual woman by a test described by the Denver scientists. This means that the chief drawback to successful birth control by this method can be overcome.

The test, originally devised by Dr. R. G. Gustavson of the University of Denver, is now being used for research in a number of hospitals throughout the country. It depends on the fact that at the time when the egg bursts from its follicle the amount of one of the female sex hormones excreted from the woman's body is at its highest for the month. This is the time when fertilization can take place.

Aid Toward Motherhood

The fact that there was such a period has long been known but heretofore there has been no way of determining this period exactly. As a result there have been many failures in attempts at birth control by the calendar method. The "safe period" fell in the same part of the monthly cycle for three-fourths of the women tested by the Denver scientists. The other one-fourth had different rhythms.

In the case of women who have been unable to have children, this test would show whether the sterility was due to failure of the pituitary gland to produce enough of the pi- (Turn to Page 237)

From Page 229

pituitary hormone that stimulates ovulation. This is the process by which the egg is released for fertilization. If pituitary failure is the cause of sterility, it might be possible to remedy it by treatment with the appropriate pituitary hormone.

A sulfur compound which made it possible for four mothers to nurse their babies, although they had been unable to do so for previous babies, was reported by Dr. Ray G. Dags of the University of Vermont.

Mother's milk is the very best food for new babies, baby specialists agree. No substitute is entirely satisfactory, although many have been tried. Many modern mothers, however, are not just unwilling but actually unable to nurse their babies. These facts explain why Dr. Dags' discovery of a substance that induces milk secretion in the mother is considered important.

The substance is cystine, the chief sulfur-containing compound of the protein molecule. It is one of the amino acids which are building stones for protein molecules and as such is an essential constituent of the diet.

Discovery that cystine is a stimulant to milk production was made on rats but the cases of the four mothers reported here today show its value for humans as well.

Clue to Intersexes

A clue to those queer causes of mixed sex in which one person seems to be part masculine and part feminine appears in research reported by Drs. R. R. Greene and M. W. Burrill of Northwestern University Medical School. There is even a hint of the possibility of producing boy babies at will, since that, in effect, is what occurred during this research on rats.

An excess of male sex hormones in the mother's body during the months before her child is born is the explanation for cases of mixed sex, if the Northwestern University scientists' findings on rats prove true for humans.

When large amounts of male sex hormones are given to pregnant rats, the offspring which would normally have been females are "permanently masculinized," Drs. Greene and Burrill reported. The degree of masculinization seems to depend on the amount of male hormones given and the length of time before birth of the offspring when treatment is started.

This treatment has produced 76 "very definitely intersexed rats." Examination

of these animals showed that though they started out to be females, their sex glands became definitely masculine.

If insulin, diabetes remedy, just were less expensive and could be taken by mouth, it would be a fine remedy or preventive for hang-overs. This appears from research reported by Drs. B. B. Clark and R. W. Morrissey of Albany, N. Y., Medical College.

Insulin, they found, increases the rate at which ethyl alcohol disappears from the blood of dogs by from 20 to 50 milligrams per cent. in 2 to 4 hours. Alkalinizing salts, such as sodium bicarbonate and sodium citrate, and glucose (sugar) have no effect on the rate at which alcohol disappears from the blood. (Blow to those who use alkaline hang-over remedies and those who pin their faith on a bed-time meal after a spree.)

Alcohol Oxidation Speeded

The combination of insulin, glucose, and an alkalinizing salt such as sodium bicarbonate, however, "produced the greatest decrease in blood alcohol, averaging 38 milligrams per cent.," the scientists reported. The animals given this combination "were in better condition" during the investigation and "appeared to recover completely sooner than those in other groups."

The burning of ethyl alcohol in the body, with its consequent disappearance, proceeds at a constant rate, the Albany scientists pointed out. It has been practically impossible to alter this rate by treatment. The reason why insulin speeds up the disappearance of alcohol from the blood is, they suggest, that insulin speeds the rate at which sugar and starch are burned and this acts like a catalyst or stimulant to the burning of alcohol.

A new chemical remedy for burns which may prove superior to the now widely used tannic acid treatment was reported by Drs. K. K. Jones, R. W. Vance and Quin De Marsh of North-

western University Medical School.

The chemical is sodium hexametaphosphate. A solution of it prevents infection of burns and other tissue that has lost its skin because of injury. This chemical combines with the fluid oozing from the skinned tissues to form a film that is moist, firm, flexible and that prevents the growth of bacteria or disease germs. Islets of living skin in the midst of the burned area are not injured by the chemical.

Underneath this film new, normal-appearing skin grows. Under the new skin is a layer of tissue full of blood vessels which the Northwestern scientists say is quite different from the undernourished tissue that regenerates when tannic acid treatment for burns is used.

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ENTOMOLOGY

Grasshopper Eggs Are Ready to Hatch Trouble

FARMERS' troubles in the West this summer are going to be little ones—billions of 'em. Most recent field surveys by Department of Agriculture workers indicate that the heavy stocks of grasshopper and Mormon cricket eggs in the soil have come through the winter in fine shape. Now they are getting ready to hatch into hungry mischief.

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