

MEDICINE

Substitute for Morphine Found After Long Search

New Substance Can Now be Made Under Government License for Further Trials on Patients

AFTER years of painstaking research, scientists have produced a new derivative of morphine in the course of experiments directed toward the discovery of a non-addicting form of morphine.

Dihydrodesoxymorphine-D is the name of the new drug. It was made by Dr. Lyndon F. Small, University of Virginia research chemist. It is ten times as effective as morphine in relieving pain.

Given as a substitute for morphine to persons addicted to the latter drug, the new product satisfied the cravings of the addicts and relieved the painful abstinence symptoms that follow withdrawal of morphine. This indicated that it also might be habit-forming.

Tests with monkeys and other animals indicate that these animals develop tolerance to the new drug as they do to morphine. It is not certain, however, that experiments on monkeys are a correct index of the new drug's addiction or habit-forming property for man.

Final Test

The final test of this point is now about to be made. Patients suffering from severe cancer and advanced tuberculosis are sure to become addicted to morphine, because that is the only drug which will control their pain and cough. A group of such patients will soon be given the new drug instead of morphine to relieve their suffering. If they fail to develop addiction to the new drug, dihydrodesoxymorphine-D will be hailed as the long-sought, safe substitute for morphine, and possibly as an aid in the prevention of narcotic drug addiction. If it can be used in the case of persons already addicted to narcotic drugs, it might aid in their "cure."

Since Dr. Small can produce only a limited amount of the new morphine in his laboratory, he has patented his discovery and given the patent rights to the Secretary of the Treasury. The

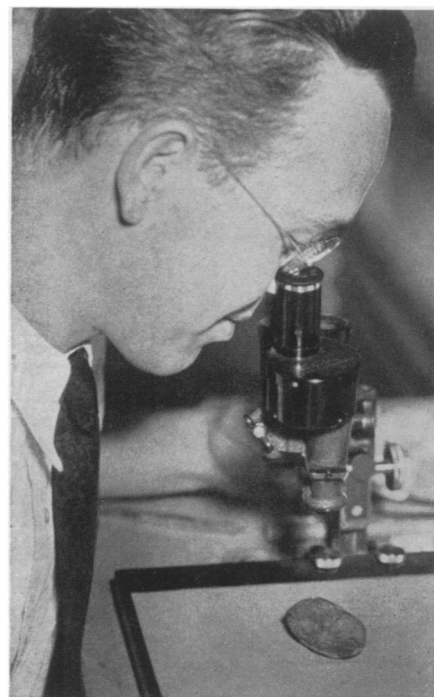
Commissioner of Narcotics is now able to license manufacturing firms to produce enough of the new drug to complete the clinical trials.

The discovery of dihydrodesoxymorphine-D was the result of a concerted attack on narcotic drug addiction by several groups of scientists working under the guidance of the National Research Council. Cooperating with the National Research Council's committee have been the U. S. Public Health Service, the Narcotic Bureau of the U. S. Treasury, the University of Michigan and the University of Virginia. Members of the National Research Council drug addiction committee are:

The Committee

Dr. William Charles White, National Institute of Health, U. S. Public Health Service, chairman; H. J. Anslinger, U. S. Commissioner of Narcotics; Prof. Charles W. Edmunds, University of Michigan; Dr. Ludvig Hektoen, Director, McCormick Institute for Infectious Diseases; Prof. C. S. Hudson, U. S. Public Health Service; Prof. Reid Hunt, Harvard University; Dr. Frederick B. LaForge, Bureau of Chemistry and Soils, U. S. Department of Agriculture; Prof. Torald Sollmann, Western Reserve University; Dr. Walter L. Treadway, U. S. Public Health Service; Prof. Carl Voegtlin, National Institute of Health, U. S. Public Health Service; and Prof. Francis G. Blake, Yale University, chairman of division of medical sciences, National Research Council.

At the University of Virginia a research laboratory was established under Dr. Small's direction for chemical analysis and synthesis of alkaloid substances related to or similar to morphine. Because few American chemists had worked on alkaloid chemistry in the past 25 years, it was necessary at the start of the work to import chemists from Europe for Dr. Small's laboratory. Dr. Small himself spent two years in narcotic research in Europe. The "imported" chemists who have



EARTH'S OLDEST EGG

The proudest product of the Chinese delicatessen industry would rate as extra strictly fresh alongside the 225,000,000-year-old fossil under the microscope of Dr. Llewellyn Price, Harvard Museum paleontologist who discovered it in the Permian Red Beds of Texas.

worked with him are Dr. Erich Mosetting and Dr. Alfred Burger.

At the University of Michigan another research laboratory was established under the direction of Prof. C. W. Edmunds and Dr. Nathan B. Eddy, for biological testing of the narcotics and their substitutes.

All clinical work is being done under the direction of Dr. Walter Treadway, chief of the division of mental hygiene, U. S. Public Health Service.

Funds for the work are being provided by the Rockefeller Foundation.

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PALEONTOLOGY

World's Most Ancient Egg Discovered in Texas

THE world's oldest fossil egg, approximately 225,000,000 years old, has been found in the Permian Red Beds, an exceedingly ancient geological formation of north central Texas, by the recently returned expedition from the Harvard University Museum of Comparative Zoology.

The egg, three inches long and rusty

in coloring, is more than twice the age of previously known specimens, the famed dinosaur eggs of the Gobi desert being about 100,000,000 years old and the oldest known to science previous to the present discovery.

It is one of the most primitive eggs ever laid on land. Prior to that time animal eggs had always been deposited in water, a feature retained from the fish ancestry of the amphibians. Unhatched, and preserved with but little distortion, the fossil gives an accurate conception of the egg's original shape and also of the character of the shell, which is slightly cracked in various places. A microscopic study of this shell is now under way to determine the structure of the limy covering.

May Be Ophiacodon

The egg cannot be definitely associated with any particular animal, but it is believed to be that of a large lizard-like animal known as *Ophiacodon*, a creature with an exceptionally large head and short limbs, measuring about six feet from snout to tip of tail. The partial skeleton of an animal of this kind was found near the egg.

Scientists have been searching in this region since 1878 for fossils but until the Harvard expedition not even a fragment of a fossil egg was discovered. The fossilization of such a delicate object and its preservation for such a long time must have required unusual circumstances.

A huge inland sea is believed to have existed during the Permian period, covering much of the states of Texas, Kansas and Oklahoma, with animals living along its shores. That these animals were present in great numbers is shown by the remains of thousands of fossils found in these "badland" patches of today.

Laid Near Water

The egg was probably laid close to the water and was quickly covered by the accumulating clays of the shore line, along with the bones of other animals carried in by the water, there to begin fossilization, it is believed.

Additional hundreds of feet of sediments eventually left the egg deep under ground. After lying there for a period of 225,000,000 years the fossils have now come to light through the gradual erosion of the overlying deposits. These ancient sea beaches are quite numerous regions of the Southwest, varying in color from vermilion to dark maroon and occasionally purple. The

deposit is mostly joint clay and sandstone with several thin layers of limestone.

What is probably one of the best fossil skulls of its kind ever found in this area, that of an *Eryops*, a salamander-like amphibian about eight feet long, was also brought back by the expedition, which was headed by Llewellyn Price and Theodore White, both of the Museum staff.

The skull is 26 inches long and 14 inches wide, and exceptionally well

preserved. The exact relationships of the skull bones to each other can be discerned, since the skull was not crushed by the weight of the overlying clay and sandstone. It will also be possible to determine the size of the brain and thus the nervous organization of the animal, as well as the creature's place in the fauna of its time.

The egg has already been placed on exhibition at Harvard and the fragments of the skull are being assembled for display in the museum.

Science News Letter, December 15, 1934

MEDICINE

Tuberculosis Test Material Isolated in Pure Crystals

Victory in Sixty Year Battle is Considered Great Advance in Medicine's Warfare Against White Plague

A GREAT advance in medicine's warfare on the great white plague, the obtaining of tuberculosis test material in pure crystals, has just been made by Dr. Florence Seibert of the Henry Phipps Institute, Philadelphia.

For 60 years scientists have been endeavoring to isolate in pure form this substance of the tuberculosis bacillus. It, like tuberculin, allows the making of a simple skin test to tell whether or not a person or animal has tuberculosis. The new purified substance will be of immediate application to human patients.

Scientists have known for 60 years that this substance was there in the TB "germ" and they have been using it in tuberculin tests on man and in vast programs of tuberculosis eradication in cattle to insure a safe milk supply. But it has never before been available in pure form.

The isolation of this new substance, called the purified protein derivative of the tubercle bacillus, may be likened to getting out of the pancreas pure crystalline insulin for treating diabetes. Using the old tuberculin would be like using a preparation of the whole pancreas to treat diabetes. The insulin would be there but so would many other substances. Old tuberculin contained the tuberculosis detective, but it also contained many other things.

To produce this important protein substance, tubercle bacilli were grown on an inorganic medium and by special

chemical methods the pure crystalline substance was isolated. Dr. Seibert has reported technical details of the isolation in the *American Review of Tuberculosis* (Dec.) Her work was done under the auspices of the medical research committee of the National Tuberculosis Association, largely supported by Christmas seal sales.

Science News Letter, December 15, 1934

PHYSICS—AERONAUTICS

Stratosphere Balloons Rising to 17 Miles

THE working of small unmanned stratosphere balloons sending back continuous reports by radio from altitudes of over 17 miles was described by Prof. J. M. Benade, distinguished Indian physicist from Forman Christian College at Lahore, India, to the American Physical Society.

Prof. Benade who is the "right-hand man" of Prof. Arthur H. Compton on the radio-balloon phases of cosmic ray research and inventor of the method reported to the Society with Dr. R. L. Doan of the University of Chicago.

The apparatus transmitting stratosphere temperature, pressure and cosmic ray intensity weighs only ten pounds, said Prof. Benade. Temperature and pressure data are transmitted by radio signals controlled by two magnetic vibrators, each of whose motion is de-