PHYSICS

Change in Atomic Material By Tube System in Reactor

➤ "CHANGE" IS the order when Brookhaven scientists use a pneumatic tube system to insert and withdraw a material into the big atomic reactor at Upton, N. Y., for neutron bombardment.

Like the familiar change-making system used in department stores, this gadget is one of the hitherto secret facts about the interior of the atomic "furnace" that has just been declassified. The Brookhaven reactor is not used for weapons manufacture, but is used for research and the manufacture of radioisotopes, which is the purpose of the pneumatic system.

Science News Letter, March 8, 1952

INVENTION

Transmitting Sound Through Ocean Receives Patent

➤ "SOFAR"—a method of transmitting sound thousands of miles through ocean water—has now been patented. Its inventor, Dr. Maurice Ewing, Woods Hole, Mass., who developed the method during the war, has assigned the patent, number 2,587,301, to the U. S. Navy.

Dr. Ewing discovered, while he was working on submarine detection methods, that there is a "sound channel" below the surface of the ocean, down about 4,200 feet, through which sound will travel great distances without much dissipation.

Consequently, if a depth bomb or other explosive device were set off at this depth, receiving stations thousands of miles away could hear the sound. By triangulation, two or more of these stations can pinpoint the location of the explosion to within a mile or so.

Explosives have been designed to be part of the equipment of lifeboats and rafts on ships and planes. Stations have been set up at various points around the Pacific Ocean.

Science News Letter, March 8, 1952

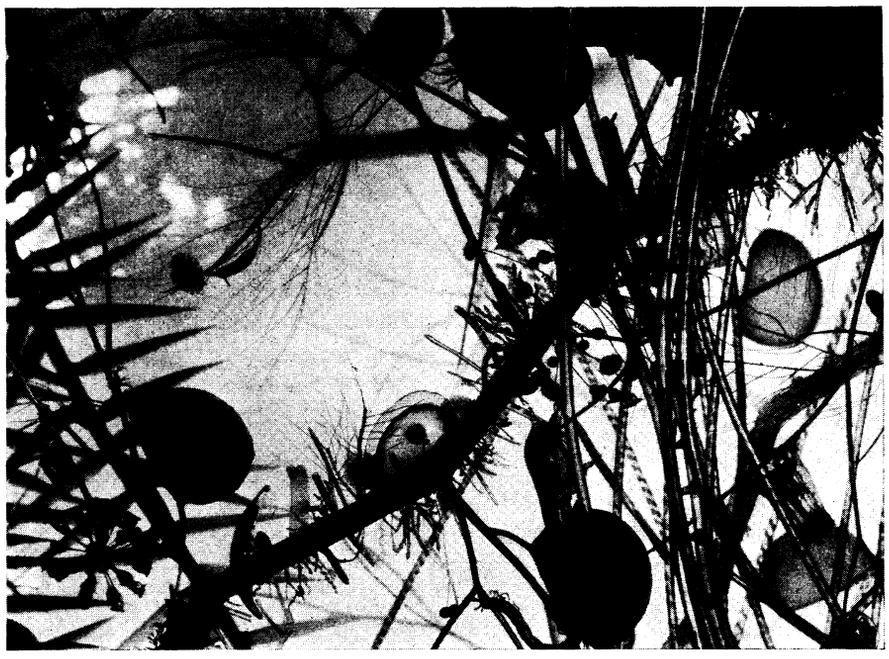
PSYCHOLOGY

Sudden Snake Jump Makes Monkeys Neurotic

➤ MONKEYS, WHEN a snake jumps at them during dinner, become neurotic, even if the snake is only a rubber one, Dr. Jules H. Massermann of Northwestern University, Evanston, Ill., reported at a New York Academy of Sciences conference on neuroses.

The monkey runs shrieking away from the food, not even stopping to examine the snake. After repetitions of this experience, the monkeys become tense and anxious, forget what they have learned, are jumpy and may even refuse food, thus showing symptoms of neurosis in humans.

Science News Letter, March 8, 1952



LIFE IN A WATER DROPLET—Model of life found in one drop of water from a fresh water pond in New England, magnified one hundred diameters or one million times. This underwater world display has just been placed on exhibit at the American Museum of Natural History in New York.

CHEMISTRY

Morphine Synthesized

Man's long struggle to synthesize the alkaloid chemicals found in plants is capped by the complete synthesis of the pain-easing drug, morphine.

➤ THE COMPLETE synthesis of morphine, pain-easing drug of the opium poppy, has been accomplished by Dr. Marshall Gates of the University of Rochester, N. Y. Announcement of this feat, in which a Swiss girl, Gilg Pschudi, assisted, will reach fellow chemists through a forthcoming issue of JOURNAL OF THE AMERICAN CHEMICAL SOCIETY.

The achievement, in the words of one chemist, marks "the last great mountain peak to be surmounted" in man's long struggle to synthesize the alkaloid chemicals found in plants. Only exception, now, is strychnine and no one is believed too interested in synthesizing this drug. Among other alkaloids found in plants are caffeine, nicotine and quinine.

Synthesis of morphine does not mean a cheap source of the chemical, for drug addicts or legitimate users. Synthetic morphine could not be made for $1,000 a gram, which is about one-thirtieth of an ounce or about 20 grains. On the legitimate market, one grain of morphine extracted from the poppy plant source costs about five cents and would sell at retail to the patient for about 10 cents, though usually it is dispensed in quarter or half grain doses.

The process by which Dr. Gates and Miss Pschudi succeeded in synthesizing the drug is extremely complicated, requiring some 20 to 30 steps. Probably only 10 or a dozen chemists in this country could follow it. Dr. Gates has been working on the problem for more than 10 years. Swiss and German chemists are hard at work on the problem, also.

Some of the intermediate chemicals used in the synthesis were made in the 1930's by Dr. L. F. Small of the National Institutes of Health. Dr. Small at that time was trying to make a synthetic chemical that would duplicate morphine's pain-relieving effect without addiction properties. He did not realize that some of the chemicals he made would later facilitate the synthesis of morphine itself.

The synthesis is a tremendous scientific achievement, but is not expected to have any practical follow-up. The reason is that there are now better chemicals which are easier to make for use instead of morphine.

Science News Letter, March 8, 1952