MEDICINE

Man-Made ACTH Soon

➤ THE day when ACTH, powerful anti-arthritis hormone of the pituitary gland, can by synthesized may be closer than anyone now realizes.

Dr. C. H. Li, University of California researcher who first isolated the hormone before its value in arthritis was known, now takes this optimitic view.

"I have a feeling now that we will be able to synthesize it," he said.

The "feeling," he explained, is like the feeling he has had before when he was working on the isolation of pituitary gland hormones. After a period of discouragement when the work seemed almost to stand still, he got a feeling that finally he was on the right road to his goal. Success in the isolation soon followed.

Now he has reported to the JOURNAL OF THE AMERICAN CHEMICAL SOCIETY (July) that he has found a way to triple the potency of ACTH. This, in effect, triples the supply, since the same quantity of the more potent material will do three times the work of the former material.

The method consists simply in boiling ACTH in an acid solution. The potency of a powerful peptide fraction of ACTH can also be tripled by the same acid boiling treatment. This peptide fraction of ACTH has been given to four arthritis patients with the same beneficial results as are obtained by ACTH itself.

FSH, another pituitary gland hormone, can now also be broken down into peptide fractions, Dr. Li reports. This hormone holds the key to fertility in both male and female. It is known as the follicle stimulating hormone, or FSH, because in the female it stimulates the growth of the ovarian follicles, making ovulation possible. In the male it may stimulate the tubules which produce sperm for fertilizing the ova.

Obtaining biologically active fractions of FSH may lead to synthesis of this pituitary hormone also. At present, the sole supply is from slaughtered livestock. Amounts available of the pure hormone are so small that adequate animal experimentation has not even been possible.

Science News Letter, July 22, 1950

AGRICULTURE

Weeds Fight 2,4-D

➤ WEEDS are fighting back. Just as super-strains of the pesky housefly have been found which can laugh at once-deadly DDT, now a grassy weed in Louisiana sugar cane is reported developing resistance against one of man's newest, most potent weed-killers—2,4-D.

The discovery was made by Leo Hebert, plant scientist at the Department of Agriculture's sugar crops laboratory at Houma, La. It was revealed in a regular work progress report to Washington.

The weed with growing immunity to 2,4-D is called Johnson grass. When sugar cane fields were first treated with the chemical, nearly all of the Johnson grass was killed. From the few surviving plants, however, the government sugar scientist saved seeds.

This year his suspicions were confirmed. Second-generation seedlings, offspring of the hardy plants which survived the first dose of 2,4-D, were found to be twice as resistant to the weedkiller as plants of the previous generation.

Johnson grass is really not a weed. It was introduced into the South as a forage crop for livestock more than a century ago. Since then it has spread widely, however. Growing profusely in sugar cane and cotton fields, it has become a top-ranking plant pest. The government considers it the No. 1 enemy of sugar cane today.

The plant specialists found that a relatively low dose of 2,4-D, applied early in the spring before the weed had pushed through the soil, reduced the emergence of Johnson grass seedlings by as much as 95%. Other pests, such as alligator weed and tie vine, were equally well controlled.

But when similar treatments were given to second-generation Johnson grass, twice as many seedlings pushed up through the soil as the year before. They were apparently resistant to the chemical.

Department of Agriculture officials say the study of Johnson grass will be continued to see if the resistance grows. They seemed to think it would.

It now appears that chemical weed control is another field in which science must always look for something new, just as it has had to do in the fight on house fly strains showing resistance to DDT, said the glum official announcement of the Johnson grass discovery.

Science News Letter, July 22, 1950

PHYSICS

Artificial Meteors from Bazooka-Like Experiment

➤ ARTIFICIAL meteors have been created and photographed in the laboratory at the Carnegie Institute of Technology, Pittsburgh. The metal jets formed have velocities comparable to real meteors (which come into the earth at about 11 miles per second speeds), Dr. E. M. Pugh reported to the American Physical Society in Washington.

As the slugs rip through the air, the head end becomes incandescent from friction, and the metal vapor trails coming from the tip are clearly seen in the photographs.

A refinement of the war-time bazooka charge was the source of the laboratory shooting stars. To make them, an explosive is hollowed out making a conical recess. Fitted tightly into this is an accurately machined metal cone. Accuracy here is essential to get a clean jet that can be photographed, Dr. Pugh emphasized. Other attempts to photograph the jets had been prevented by a shroud of misdirected particles surrounding the main jet which were due to inaccurate alignment.

Super-high-speed camera techniques are a must for such photographs, and some of these details were revealed by Dr. Pugh's collaborators R. Heine-Geldern, Simon Foner, and E. C. Mutschler. The light source is a wire exploding under an overload of electrical current, giving single flashes of 500,000,000 candle power. An ordinary mechanical shutter, good to a thousandth of a second, is far too slow to stop meteors in their tracks. The electrical Kerr cell technique, with operating voltages of 25 kilovolts, was found necessary to give the shutter speed of one millionth second.

Besides meteors, the collaborators, who were working under a contract with the office of the Army's Chief of Ordnance, studied such things as the way an explosive explodes, what happens when two explosives go off simultaneously near each other, and how shock waves travel through metals.

Science News Letter, July 22, 1950

PHYSICS

Color Photos Made Quickly

➤ COLOR photographs, better for war-time camouflage detection, are made in quick time and as easily as black-and-white prints by a process developed in Dayton, Ohio, at Wright-Patterson Air Force Base.

With the new method the time required for processing color film is reduced from 90 to 20 minutes, and the printing time from 90 to 15 minutes. The time saving is of particular importance from a military standpoint.

Basis of the new method is a pre-hardener which permits the processing to be done at 80 degrees Fahrenheit instead of the 68 to 70 degrees used ordinarily. The hardener prevents the emulsion from becoming too soft at the higher temperature. All ordinary standard chemicals previously used in Air Force color processing kits have been altered to meet the new requirements.

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