PHYSICS

Fusion Control Advances

Three methods of approaching the problem of thermonuclear control are currently being tried by American scientists. "Considerable progress" is reported by AEC Chairman.

➤ THE "CONSIDERABLE progress" toward controlling H-bomb reactions for peaceful power reported by Chairman Lewis L. Strauss of the Atomic Energy Commission is believed the production of the desired neutrons from thermonuclear reactions.

Mr. Strauss said U. S. and British scientists would announce their results simultaneously within a few weeks in technical journals.

It is expected the announcement will be that scientists in laboratories on both sides of the Atlantic have managed to produce neutrons resulting from thermonuclear reactions.

It is known that it is not particularly difficult to produce neutrons, the neutral cores of hydrogen atoms also important in the fission reaction of atomic bombs. It is extremely difficult, however, to produce neutrons as a result of thermonuclear reactions, duplicating in the laboratory the stellar reactions of the sun and other stars. The desired neutrons can be spotted by their energy, 2,430,000 electron volts. The unwanted neutrons have energies either above or below this level.

Elaborate experiments are required to determine the neutrons' energies.

The problem of controlling thermonuclear reactions consists of finding a method of reaching temperatures of a hundred million degrees, then confining the hot gas for a sufficiently long time. In the American program, Mr. Strauss said, three methods of approach to this problem are being tried.

The British are trying only one, which duplicates one U. S. approach, producing a "friendly rivalry," in which scientists in one country, then in the other, seesaw for the lead.

Although details of the approaches are shrouded in secrecy, many scientists believe the most promising containment method is to make use of the so-called "pinch effect." Using this effect, the extremely hot gas is made to contract in a strong magnetic field, thus containing itself so it does not touch any walls. No material container known could withstand the tremendously high temperatures needed for thermonuclear reactions.

Science News Letter, January 18, 1958

PSYCHIATRY

Tie Hypnosis and Insanity

➤ TWO OF the most puzzling mental phenomena known to modern psychiatry, hypnosis and the mental illness schizophrenia, are linked together by a new theory that both are the result of suggestion.

Dr. Peter D. King, Warren State Hospital, North Warren, Pa., believes the symptoms of schizophrenia, regardless of the "specific cause," are formed by the same basic mechanisms seen when normal people are hypnotized.

Schizophrenics have a tendency to withdraw from personal contacts. This tendency is often conscious and voluntary and is similar to a hypnotized subject's tendency to cooperate with the hypnotist by sitting comfortably and relaxing.

Under hypnosis, a person's "critical faculty" is overwhelmed by the hypnotist's suggestions. Similarly, in schizophrenia the critical faculty is overwhelmed by unconscious forces within the patient.

Other symptoms of schizophrenia, such as thought distortion, disturbances of sensation and perception, disorientation, and impulsive acts, can also be found during hypnosis.

Like the schizophrenic, a hypnotized subject seems to turn his attention inward and becomes much less spontaneous than he was. Even catalepsy, a condition in which the schizophrenic will remain in any position he is placed, can be induced in normal persons by hypnosis.

From these and other similarities, Dr. King believes that schizophrenia is a "suggestive phenomenon" analogous to hypnosis. It results from the unconscious and perhaps conscious conflicts and forces present that "continuously influence the critical faculty, or ego, until it is partly or completely subdued. The result is the picture which we commonly call schizophrenia."

His theory appears in the current *Journal of Nervous and Mental Disease* (July-Sept., 1957).

Science News Letter, January 18, 1958

MEDICINE

New Class of Anti-Cancer Chemicals for Animals

➤ SUCCESSFUL USE of a new class of anti-cancer chemicals in animals is reported by Drs. William Regelson and James F. Holland, Roswell Park Memorial Institute, Buffalo, N.Y., in *Nature* (Jan. 4).

The chemicals are all relatives of heparin, the powerful anticoagulant substance in the body that keeps blood clots from forming.

Heparin has been known for many years to inhibit the cell division that is necessary for growth. But its use as an anti-cancer agent has not been possible because the high dosage needed would probably cause dangerous changes in normal blood clotting ability, the researchers reported.

In the search for possible heparin substitutes, several compounds called polyethylene sulphonates were studied in humans. Their toxic effects included baldness and fingernail alteration which suggested that they, too, might be inhibiting normal, rapidly-growing skin cells.

So the heparin-like chemicals were then tested in cancer-bearing mice, and found to slow the growth of seven different types of cancers. The effective dose levels were low enough to prevent the fatal loss of all blood-clotting ability.

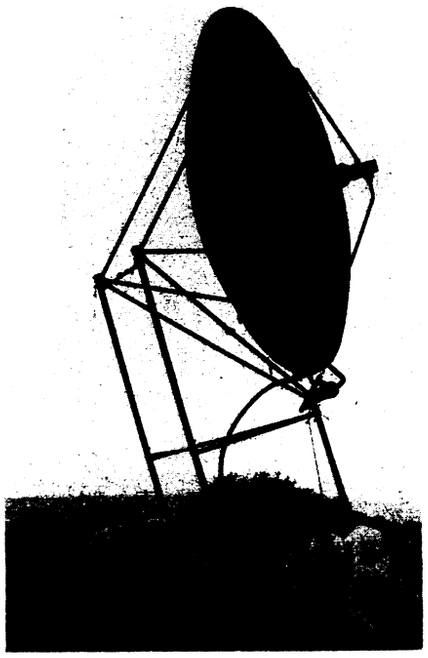
The anti-cancer effect could be had without encountering any of the anticoagulant properties of the chemicals.

The higher dose levels were even more effective against the cancers, but the occurrence of internal hemorrhages made them too dangerous.

Studies are now underway to see if the chemicals could be combined with other drugs known to reverse the blood thinning effect of heparin. This would allow higher and more damaging doses to be used on the cancers.

The research was supported in part by a grant from the National Cancer Institute, Bethesda, Md.

Science News Letter, January 18, 1958



PORTABLE ANTENNA—This air-inflated antenna, part of the Collins UHF transhorizon terminal developed for the U. S. Army Signal Corps, may be easily erected or dismantled. Disassembled, the complete structure can be stored in a space approximately three feet by two feet by seven and a half feet.