PHYSICS

Fusion Power Still Secret

Only a small fraction of the work being done on taming the hydrogen bomb reactions for production of peaceful power is now being discussed.

➤ BOTH the Russians and the Americans are telling only a tiny fraction of what they know about taming the hydrogen bomb's awesome power for peaceful purposes.

Scientists in both countries have lifted the secrecy curtain slightly, enough to show it seems to be only a question of time, brains and many dollars to wrest power from fusion reactions.

What these thermonuclear reactions are, the amount of energy they release and how they keep the heaven's stars blazing have been known for a long time.

However, reports made at the American Nuclear Society meeting in Washington revealed for the first time at one gathering the logical steps needed to make a going thermonuclear reactor.

The problem of achieving a controlled thermonuclear reaction is one of heating and confinement. It is necessary to heat a suitable nuclear fuel to temperatures of a hundred million degrees or more, then to confine it at that temperature long enough for fusion to take place, with the resulting energy release being larger than the losses. This excess energy would then be harnessed as useful power.

Although scientists cannot now guess at the cost of fusion power, they see no reason why it would not be competitive with power obtained by tapping conventional sources or from the fissioning of such heavy elements as uranium or plutonium.

Achieving power from fusion would give a truly permanent solution to mankind's expanding need for energy sources. Among the several light elements that could be used as fuel, the deuterium in the world's oceans alone woud sustain an energy production rate 1,000 times the world's present capacity for more than a billion years.

Finding out how to make a thermonuclear power plant is one of the great scientific challenges of the century. Tapping fusion energy offers hope for improving the health and living standards of most of the world's people.

Ingenious suggestions have been made for possible devices to control and extract useful energy from fusion reactions.

The study of these devices and the physics of their application is the reason for the Atomic Energy Commission's Project Sherwood, under the direction of Amasa S. Bishop. This research program is under the direction of a committee consisting of Dr. Edward Teller of the University of California, Dr. James L. Tuck of the Los Alamos Scientific Laboratory, Dr. Lyman Spitzer Jr. of Princeton University Observatory, and Dr. William Brobeck of the University of California Radiation Laboratory.

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PHYSIOLOGY

Heart Action After Death

➤ HEART ACTION has been seen in animals up to 18 days after death, researchers at the University of Belgrade, Yugoslavia, report here in *Nature* (Dec. 8).

Their studies were made on hearts taken from experimental rats that were cooled to between 55 and 60 degrees Fahrenheit before death.

The hearts were kept at 42 to 48 degrees Fahrenheit except for a few moments each day when they were rewarmed to 100 to 104 degrees Fahrenheit and observed for any signs of activity.

This daily rewarming technique preserved contractions of the ventricle or pumping section of the heart for several days, J. Giaja and J. Radulovic of the University's Institut de Physiologie de la Faculte des Sciences found.

They also found rhythmic movements near the openings of the great veins feeding the hearts for as long as 18 days after death.

Earlier studies have shown that, in rats cooled to the point where heart activity is frozen to a halt, the action can be completely restored approximately one hour after breathing and circulation stop, the investigators report.

The scientists point out there is no true re-establishment of heart functions after this time. They say only that there are a few signs of activity of the heart muscle.

Science News Letter, December 22, 1956

ORNITHOLOGY

Be Sure to Report Yellow Band on Goose

➤ SEVERAL HUNDRED BRANT, a comparatively little known species of sea goose, were decorated with yellow plastic neck bands when they were trapped last summer on Southampton Island, Northwest Territories, Canada.

Cornell University, Ithaca, N. Y., and the Canadian Wildlife Service sponsored the expedition to study a colony of American brant on their tundra nesting grounds. Several hundred of the 1,500 brant, which were trapped and banded with U. S. Fish and Wildlife Service leg bands, were given the yellow bands to assist in ready observation and rapid identification.

Thomas W. Barry of Cornell's conservation department has requested that persons seeing brant between now and next spring notify him of the date and location where the neck-banded or other brant are observed, the number of birds with neck bands, and the total number of brant in the flock.

The information is sought as part of an over-all study to learn more about the life habits and movements of this comparatively little known species of sea goose. The American brant breeds in remote Arctic areas and winters principally on the Atlantic Coast from New Jersey south.

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TECHNOLOGY

Manpower Lack Slows Missiles Production

➤ THE SPEED with which guided missiles can be designed is limited by the shortage of top scientists and engineers, the American Institute of the Aeronautical Sciences meeting in Toronto was told by Dr. Simon Ramo, executive vice-president of the Ramo-Wooldridge Corporation, Los Angeles.

Technical difficulties alone do not limit progress, he said. Numerous desirable technical feats never accomplished could be done promptly so far as the laws of science are concerned, he said, but the problem of making arrangements will for some years remain sufficiently difficult to control temporarily the rate of advance.

A guided missile system takes practical engineering knowledge and experience, the ability to organize a complex operation, and the ability to make arrangements with people, government and industry, he explained. People who have qualifications for this work, he has found, are decidedly limited in number.

Science News Letter, December 22, 1956

PHYSICS

Produce First Ice Cubes Made With Heavy Water

➤ ICE CUBES of heavy water, often mentioned as an important ingredient for thermonuclear experiments, have been produced for the first time, the Southwide Chemical Conference meeting in Memphis, Tenn., was told.

Heavy water is oxygen combined with deuterium, or heavy hydrogen, instead of normal hydrogen and is very useful in atomic piles. By freezing the heavy water, deuterium is found to be more concentrated than in unfrozen water.

The "heavy ice" was obtained by violent agitation during a period of slow freezing, Drs. Hilton A. Smith, University of Tennessee, and John C. Posey of Union Carbide and Carbon Chemical Company reported.

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