

PHYSICS

First Fusion Power Data

Atomic Energy Commission's 20th semiannual report tells first details on United States program to use fusion reaction for peaceful purposes.

► FIRST DETAILS of American controlled thermonuclear research (atomic power from the H-bomb reaction) are revealed in the 20th semiannual report of the Atomic Energy Commission.

Among the facts made public are:

1. Any thermonuclear power unit gives promise of being extremely safe, since the amount of fuel within the machine at operating temperatures would be very small. There would be no dangerous fission debris as with uranium or plutonium (A-bomb material).

2. Deuterium or double-weight hydrogen if "fused" into heavier elements would constitute a source of energy virtually without limit since it occurs in great abundance in sea water.

3. Temperatures of 100,000,000 degrees Centigrade or higher (equivalent to those in interior of sun) would be needed to fuse and ionize under control the deuterium.

4. The big problem is to create the electric or magnetic field that will insulate the walls of the reaction chamber from such extremely high temperatures at the center of the container. Any material known would vaporize instantly at such temperatures.

5. A controlled thermonuclear reactor burning helium 3 might eventually be developed that would produce no neutrons at all and would need no neutron shielding, necessary in large amount for the hydrogen isotope fusion reactor. But the helium fusion furnace is even more remote than the hydrogen fusion reactor because the temperatures needed would be much greater.

6. Thermonuclear research being conducted at three major and two minor sites in the United States is "on a very long-term basis" but the report says "it is probable that success will be achieved eventually."

Although power from the H-bomb reaction has been discussed for many years, it became known definitely at the Geneva atomic conference last August that the major atomic powers were working on the problem.

A Russian scientist, Igor Kurchatov, talking at Harwell, England, on April 26, declassified Soviet thermonuclear research even beyond some details set forth in the present AEC report.

The three major AEC thermonuclear research sites are at Los Alamos, N. Mex., Livermore, Calif., and Princeton, N. J., while smaller projects are under way at New York University and Oak Ridge, Tenn.

The AEC also reported that recent experiments at Oak Ridge on the states of atomic ionization produced by radioactive

decay have shown that the ionization can be much more extensive than heretofore realized.

Science News Letter, August 11, 1956

MEDICINE

Try Citrus Chemicals For RH Blood Trouble

► CHEMICALS from citrus fruit peel and pulps have been tried with some success to overcome Rh blood trouble in mothers and babies.

Results of the trial are reported by Dr. Warren M. Jacobs of Baylor University College of Medicine, Houston, Tex., in *Surgery, Gynecology and Obstetrics*.

Six mothers known to have developed antibodies or become immunized against the Rh blood factor were given the citrus chemical compound starting before the 14th week of pregnancy.

The idea was to prevent the "cross-over" of Rh antibodies in the mother's blood to her unborn child. It is the Rh antibodies that destroy the red blood cells of the Rh positive blood in the baby, often resulting in the infant's death.

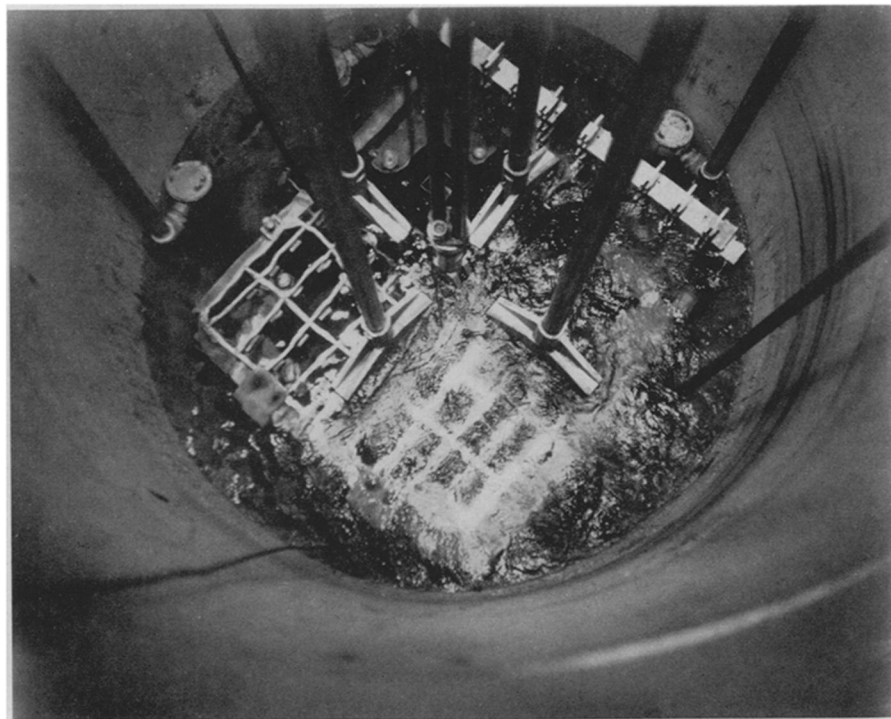
The "most dramatic results" came in three cases of women who had previously given birth to erythroblastotic babies, that is, babies affected by the Rh antibodies. These women showed no increase in number of Rh antibodies through pregnancy and gave birth to babies who were completely unaffected.

In the other three women, there was only a slight rise in Rh antibodies during pregnancy and the babies were healthier and less affected than the previous babies of the same mothers. They were, however, given exchange blood transfusions as an added precaution. Exchange transfusion, in which all the baby's blood is removed and replaced with fresh blood is generally done to save lives of babies of Rh negative mothers.

The citrus medicine Dr. Jacobs used is a water soluble bioflavonoid compound called C.V.P.

The compound cannot be considered a "cure-all" on the basis of these cases, Dr. Jacobs warns. He considers it worth further trial, however. He has now given it to 20 mothers altogether with equally good results, although his report covers only the first six.

Science News Letter, August 11, 1956



REACTOR CORE—Prior to fuel loading, the reactor tank of SPERT I is filled with water, which serves both as a coolant and moderator. Note tops of four blade-type shim rods and upper grid assembly that holds fuel elements in place, raised for loading at left, in hold-down position at right. SPERT I is operated at the National Reactor Testing Station for the Atomic Energy Commission by Phillips Petroleum Company for tests under transient conditions.