News of Science

Japan Reports Fusion

Physicists of Osaka University in Japan, directed by Minoru Okada, report that they have obtained a thermonuclear fusion reaction comparable to that announced recently by Great Britain and the United States [*Science* **127**, 275 (7 Feb. 1958)]. A discharge chamber was operated at 85,000 volts and about 1.1 million amperes; a fusion reaction is believed to have occurred for a millionth of a second. It is estimated that the experiment produced temperatures of 1 million degrees Centigrade. Okada told the press that the heat could well have been double that amount and that the experimental equipment should be able to produce 5 million degrees centigrade.

Yasuji Fushimi, chairman of the Atomic Energy Committee of the Japan Academy of Sciences, says that the apparatus used was "much smaller than the British Zeta and cost about one-tenth as much." He observed, however, that the number of neutrons emitted in the Japanese reaction, estimated at 5 million, "seemed to show a better result than Britain's Zeta apparatus." The British experiment produced 3 million neutrons per pulse.

Fushimi also said that Japan's work in thermonuclear fusion was "in the same stage as the Soviet Union was in the tests announced two years ago." In 1956 a Soviet scientist, Igor Kurchatov, told an audience in Britain that temperatures of about 1 million degrees centigrade had been obtained in experiments in which massive electric currents were discharged in short bursts through tubes containing gases such as heavy hydrogen.

National Water Shortage

The Population Reference Bureau warned in a report released on 3 February that "water shortages are now a national problem" and that the United States "might not have enough of this precious mineral to go around" in the not-too-distant future. Although the nation as a whole has increased development and conservation of its water resources in the past 10 years, "our steady population growth is placing heavier and heavier demands on supplies of this most basic natural resource."

The bureau says communities in 45 of the 48 states have been affected by lack of water at one time or another. Furthermore, in 1957, an estimated one in every four Americans felt the water shortage in some manner.

The hardest hit states are those in the Southwest. Paradoxically, this area has received a very large influx of persons from other states in recent years. Projections of the U.S. Census Bureau indicate that five of these states (Nevada, Arizona, California, New Mexico, and Utah) are expected to be among those showing the highest percentage of population increase between 1955 and 1970. Some of these localities may be forced to take steps to restrict the number of new residents, and more especially of new industries. To demonstrate the water shortage in various parts of the nation, the report cites the following cases.

In Dallas, Texas, last year, "water bars" did a lively business selling distilled water at 50 cents a gallon—more than the price of gasoline.

Last fall, the three large reservoirs that serve northeastern New Jersey industry and cities were down to about one-third of normal capacity.

Even in the humid parts of the nation, startling increases in water use have been noted, especially in Indiana and Massachusetts. In southern Indiana, some 100,000 gallons of water a day had to be trucked into rural areas, where farm wells went dry during the record drought in the summer of 1953. Since then, ground-water reserves have improved, but there are considerable areas suffering chronic summer shortages. With an estimated population increase of close to 20 percent for the northeastern United States by 1970, greater expenditures to meet water shortages are predicted there as in large sections of the Midwest. Robert L. Cook, director of the Population Reference Bureau, comments that "there should be vigorous appraisal of some of the economic and social factors behind current fertility trends and migration."

Industrial Engineering Research

The Research Information Committee of the American Institute of Industrial Engineers is starting to secure abstracts of research performed in the period 1 July 1952 to 1 July 1957. Sources from which information will be solicited are universities, industrial organizations, research institutions, and nonprofit organizations, including Government agencies and professional societies. The information-collecting program will provide a valuable service to industry and universities and especially to industrial engineers. Research abstracts are to be collected in the areas of work measurement, methods, plant engineering, human engineering, engineering economics, organization planning, industrial statistics, production control, data processing, operations research, and cost analysis.

The committee will appreciate all information on Industrial Engineering research, past and present, about which it might gather more specific details. Write: Research Information Committee, AIIE, Department of Industrial Engineering, Washington University, St. Louis 5, Mo.

Solar House

A sun-heated house has just been completed in Lexington, Mass., by a team of engineers and architects of Massachusetts Institute of Technology. The result of 20 years of solar energy research at M.I.T., the house has been built to demonstrate that enough facts and equipment are now available to combine a reliably engineered solar heating system with a house designed for comfortable suburban living in a northern climate. The house will be sold to a private family, but M.I.T. engineers will retain separate access to a basement equipment and instrument room to gather data on the performance of the solar heating system after the purchaser has moved in.

The solar collector in the house consists of 640 square feet of glass, two layers thick, over a similar area of thin (.025-inch-thick) aluminum sheet painted a heat-absorbing black. The aluminum sheet absorbs the solar energy, and the glass lets the sunshine in but keeps the longer waves of heat energy from passing back out again.

Water is circulated through copper tubes attached to the aluminum sheet, and the captured solar energy is then transferred from the sheet to the water. This hot water is stored, in turn, in a 1500-gallon basement tank. To heat the house, the hot water in the tank is pumped through a heat exchanger to transfer the heat from the water to a stream of air. This warm air is then