

sent the efforts of the committee to define more exactly these general terms. Other hearings have been concerned with scientific education, weather reconnaissance and control, intelligence on Russian activities, and many other matters. In time, this exploratory activity, which is under the constant scrutiny of other Congressional committees, will help determine the fields of inquiry which the whole Congress will accept as the proper province of the House group. One other end essential to political life, is also served. The committee and its members, because of the topicality of its subjects and the stature of many of the witnesses, receive rather wide publicity.

Future Hearings

Although the committee does not issue schedules of future hearings, it is expected that a broad pattern of investigation will continue in the future. According to informed sources, hearings may be expected on computers, solid-state physics, and oceanography. The oceanography hearings are expected to include examination of the recent proposal of the National Academy of Sciences for a 10-year program of ocean study, including the construction of a number of research vessels. A bill embodying the Academy's recommendations is said to be in preparation. Another bill, reflecting an idea first suggested by Wernher von Braun, is also expected to come from the committee. This is the so-called "tithe" bill. Under its provisions, a 10-percent increase would be made on every research and development contract let by the Government, this amount to be earmarked for basic research in the field to which the contract is directed. It is estimated that passage of the bill would add approximately \$600 million to the country's annual expenditures for basic research.

Nuclear Reactor Housed in 190-Foot Sphere

The 300-ton reactor for the Commonwealth Edison Company's Dresden Nuclear Power Station is now being installed at the plant near Morris, Ill. The reactor vessel is 42 feet high and 12 feet in diameter. Its walls are 5½ inches thick, and are made of low-carbon steel with an interior lining of ⅜-inch stainless steel. Built by the New York Shipbuilding Corp., the unit was shipped by barge from Camden, N.J., over a circuitous 3600-mile route.

Dresden Station is expected to be ready for regular service by mid-1960. The General Electric Company is building the plant for a contract price of \$45 million.

U.N. Surveys Development of New Sources of Energy

Notable progress in the last 2 years in developing applications of solar, wind, and geothermic energy is reported in a United Nations study on new energy sources. The report, prepared at the request of the U.N. Economic and Social Council, was considered by the council session that opened in Mexico City on 7 April.

Besides describing technical and other developments in the use of energy from the sun, the wind, and the earth, the report proposes the scheduling, in about 2 years, of an international conference on new sources of energy other than the atom. The report also suggests that the agenda for such a conference should focus attention on applications rather than on discussion of scientific principles and basic research.

In a summary of recent developments, the report says that direct conversion of solar energy to electricity by means of solar batteries and by thermoelectric converters is rapidly being advanced.

Work also continues, though at a slower rate, on the use of solar energy in steam-raising, air conditioning, refrigeration, and water distillation. Less progress appears to have been made in developing solar-heat storage, solar engines, and solar furnaces for industrial production. A significant aspect of recent developments has been the increasing attention given to new materials, such as plastics, suited for use in solar equipment.

In the field of wind power, the past 2 years have been a period of "consolidation and of transition from experimentation to applied research and commercial use." In underdeveloped countries, wind-power surveys have led, in a few cases, to the installation of the first modern wind-power plants. The linking of large wind-power plants to local or country-wide grid systems is being explored. Most of the work on this is being done in Europe.

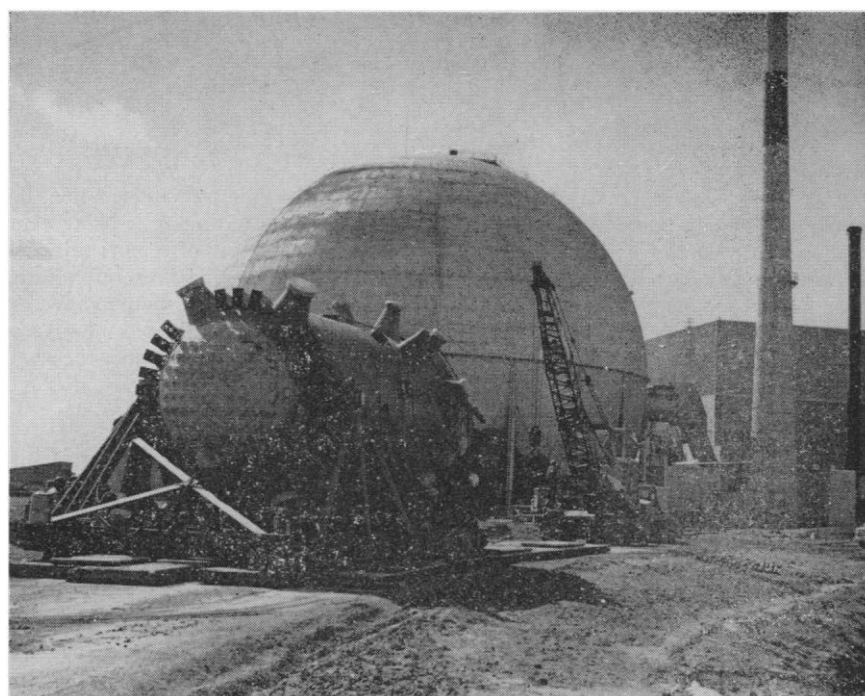
As regards geothermic power (natural steam and hot water), the report notes that production of electricity from this source—limited 2 years ago to Italy—is being started in other countries. The greater interest in geothermic power is also reflected in the search for and discovery of new geothermic fields.

In the section of the report describing development in each of the three new energy fields, the following points are covered.

Solar Energy

Introduction of new devices and materials has helped improve efficiency and reduce costs in practical application of solar energy. The design, manufacture, and installation of solar water heaters are proceeding in Australia, the Belgian Congo, Burma, Chile, Egypt, France, French West Africa, Israel, Italy, Japan, New Zealand, the Union of South Africa, the United States, and the U.S.S.R.

Solar cookers may become a common sight in some countries, where women are accustomed to being out-of-doors, where the main meal is eaten during the



Nuclear power reactor just before it was moved into a steel sphere at a plant near Morris, Ill.

day, and where the introduction of the cooker is undertaken by persons familiar with the psychology of the people. First attempts to introduce solar cookers to villagers in less developed areas failed, largely because of the neglect of sociological factors.

The report mentions an experimental sun kitchen that was tested by the Helio-laboratory of the U.S.S.R. Academy of Sciences. It is estimated that such a kitchen, operating 250 days a year in sunny regions of the U.S.S.R., could save approximately 1000 kilowatt-hours of electrical energy.

Experimentation is also being carried on in several countries (such as Canada, Japan, and South Africa) in space heating and cooling. A number of solar-heated houses have been built in the United States. Investigations into solar air conditioning have also been carried out in a number of countries, and the U.S. has developed solar-energy cooling systems for livestock shelters.

Research into solar refrigeration has resulted in a solar refrigerator being devised in Israel, while in the U.S.S.R. and France ice-making machines based on absorption refrigeration have been constructed.

Experiments are also proceeding in a number of countries for applying solar heat for mechanical power and electricity. A helioboiler is being constructed in Israel, and Soviet scientists have drawn up plans for a large solar power installation to be erected in the Ararat Valley of Armenia.

As regards direct conversion to electricity, most of the progress so far achieved, it is reported, has been related to the discovery of new materials for use in generation by means of thermocouples and photovoltaic devices. The latter have been used in artificial satellites.

Of importance to arid regions are developments in the use of solar energy for production of fresh water. Several small units for distilling sea water or brackish water have recently been built in Australia, Italy, the African countries of the French community, and the United States. Larger pilot plants have been constructed in the United States and the U.S.S.R.

New methods of salt production by means of solar energy are being tried out in several countries and in some cases have been put to commercial use. The report mentions an economical and efficient method used in the Union of South Africa for separating common salt and Glauber's salt from natural brines. The use of solar reflectors to concentrate palm juice to produce unrefined sugar is reported from Burma and India.

Progress in using solar furnaces has been particularly rapid since 1956, says

the report, and over 30 solar furnaces are operating throughout the world, most of them located in France, the United States, and the U.S.S.R. Solar furnaces are particularly useful as laboratory tools for research on fusion of rare metals, for the furnaces offer the unique advantage of complete purity in processing. They are also useful for testing metals for heat resistance—for examples, metals to be used in nuclear devices—and for small-scale mineral refining in remote locations.

Wind Power

The number of countries undertaking systematic research on wind power has been steadily increasing, the report states. Listed among these are: Israel, where a general wind survey has been completed and two small wind-driven electric generators have been installed; Spain, where surveys have been made with a view of using windmills for water pumping and for the desalinization of brackish waters; India, where testing stations have been set up to determine the potentialities of wind-driven plants for pumping water and generating electricity; Uruguay, where a survey of some 10 to 12 selected wind-power sites has been initiated; Burma, where studies on possible uses of wind-power are being made; and Pakistan, where wind measurements are being made to find favorable sites for water-pumping windmills.

While designs for wind-driven generators vary in different parts of the world, there is general agreement on several points, says the report. The tendency is to employ conventional, propeller-type machines which drive a generator through some form of gearing and to use a tower of the height necessary to give adequate ground clearance.

Small wind-power units (under 10 kilowatts) are now mass-produced in several industrialized countries and are used for radio and television relay stations, small residential areas, isolated resorts, pumping plants, navigation lights, and fog signals. An example of these is a medium-scale, wind-driven power unit developed in the U.S.S.R. It has a 25-kilowatt capacity and is used to supply electricity to villages and collective farms. Wind-driven generators for use with electrical networks have been tried out in Denmark, Algeria, the Federal Republic of Germany, Holland, the United Kingdom, and the U.S.S.R.

Geothermal Energy

Considerable progress made during the last 2 years in several countries in exploring, developing, and utilizing geothermal energy is reported. Whereas 2 years ago only one country (Italy) had geothermal power plants, today two others (New Zealand and the U.S.S.R.) are producing electricity by this means, and others

expect to inaugurate plants in the near future. Additional geothermal fields have been discovered in France, Burma, Kenya, and the United States (southern California).

A number of geothermal resources in Mexico, having been evaluated by a U.N. technical assistance expert, are now under active development. In the West Indies, again after preliminary evaluation by a U.N. technical assistance expert, exploration drilling was begun on the island of Santa Lucia. Geothermal energy has been found at two places in El Salvador.

Iceland's considerable geothermal resources, long used for space heating, will be used for the production of sea salt; this will reduce imports of salt required in the country's fishing industry. The possibility of producing heavy water by means of geothermal energy has also been investigated in Iceland.

The first geothermal power plant in the U.S.S.R. has begun operation on the Kamchatka Peninsula, while the first units of a 293,000-kilowatt program have been inaugurated in New Zealand. Facilities for the latter are at Wairakei, where the average well depth is 2,000 feet and where wet steam is discharged from the wells with high intensity.

Recent Events in Radiocarbon

There have been several events recently in the field of radiocarbon.

Radiocarbon Supplement Established

The *American Journal of Science* has announced the establishment of a *Radiocarbon Supplement*, to be devoted wholly or largely to publication of radiocarbon date lists from laboratories in various parts of the world. Richard Foster Flint and Edward S. Deevey, Jr., are the editors.

Volume 1 of the *Supplement* will appear in May. Thereafter, one volume will appear each year. The office of the *Supplement* is the same as that of the *American Journal of Science* (Box 1905A, Yale Station, New Haven, Conn.); however, the *Supplement* will be separated from the *American Journal* and will be sent to a separate subscription list. The price of the first volume is \$2.50.

Radiocarbon Association Formed

Radiocarbon Dates Association, Inc., a nonprofit corporation, has opened headquarters at Andover, Mass., with the generous assistance of the Wenner-Gren Foundation and the National Science Foundation. The organization was formed after an ad hoc committee had studied methods for developing and distributing edge-punched cards bearing