thermore, in the past 50 years other causes of death such as the infectious diseases have lost much of their importance, thus increasing the proportion of deaths caused by cancer.

Michigan Reactor Controversy

The Atomic Energy Commission has granted a conditional construction permit to the Power Reactor Development Company of Detroit for the building of a nuclear power plant near Monroe, Mich., with a capacity of 100,000 kilowatts of electric power. The plant, which will be known as the Enrico Fermi Atomic Power Plant, will have a reactor of the fast-neutron breeder type.

The Power Reactor Development Company is composed of 26 industrial concerns, more than half of which are utility companies. The power generated by the nuclear plant will be distributed by the Detroit Edison Company, one of the member industries.

The permit covers only construction of the nuclear plant and does not extend to its operation. However, issuance of the permit has evoked strong protests. The AEC's advisory committee says that not enough is known about fast nuclear power plants to rule out the possibility of a dangerous failure. On the strength of this opinion, Thomas Murray, a member of the commission, and Sen. Clinton P. Anderson and Rep. Chet Holifield of the Joint Congressional Committee on Atomic Energy, have objected to the commission's conditional approval of the new reactor. In a statement to the press Holifield said:

"A small experimental operation of a fast-breeder type reactor "melted down' in Arco, Idaho, last November. There was no serious reaction because the operation was only a tiny laboratory experimental type, but it was an 'accidental' melt-down from causes not foreseen. As far as we know the same thing could happen to the 100,000-kilowatt plant the AEC has approved for Michigan."

Belgian Reactor Ban

Public fears in Belgium have led to the banning of the reactor that was to have been exhibited at the International Exposition to be held in Brussels in 1958. However, a pilot model with a capacity of about 11,000 kilowatts may be built within easy distance of the city. Some of Belgium's leading industrialists in the power production field have been in the United States discussing this and related matters with the Atomic Energy Commission and private industry.

According to a report in the *New York Times,* the Belgians are no more concerned than others about radiation danger. However, on the basis of available information the citizenry feel that the operation of even a pilot model within the city limits seems to be a "needless, even a foolhardy risk." Belgium is by no means behind in matters of nuclear energy. Because she possesses one of the world's largest sources of uranium, Belgium has received special treatment with regard to the exchange of information and materials and therefore has a well-advanced atomic energy program.

South African Observatory

Six European nations are considering building a joint observatory in South Africa that will be second in size only to Mount Palomar in the United States. The South African observatory would have a 120-inch telescope compared with Mount Palomar's 200-inch unit. The nations involved are Britain, France, West Germany, Sweden, and the Netherlands.

Pieter T. Oosterhoff of Leiden Observatory, who is leading a joint European southern observatory expedition on a survey of possible sites in South Africa, says that all of these countries, except the United Kingdom, have approved the project in principle. Individual financial contributions are yet to be agreed upon, and the U.K. is expected to make known its decision at the next meeting of the group to be held at Stockholm in October.

U.K. University Population

Wallis Taylor has estimated the size of the university-age population (18, 19, and 20 years) to be expected in the United Kingdom for each year up to 1972 [*Nature* **178**, 135 (21 July 1956)]. The estimates are based on forecasts for the survival of children already born, with allowances for the decreasing mortality this population has shown.

The population in this age group was 1.64 million in 1955. According to the estimates, the population will increase by 42 percent to reach a maximum of 2.34 million in 1966, and will decline steadily to 1.95 million in 1972. Taylor's figures indicate that the peak number of students who will be seeking university education will be larger than had hitherto been expected.

University Research in the Soviet Union

The role of universities in research in the Soviet Union is undergoing a major change, according to the *New York* Times. The Soviet Government has ordered the transfer of a number of research institutions from the control of the Soviet Academy of Sciences to that of the universities. The Ministry of Higher Education, which controls the universities, will compile a plan that will stipulate the most important areas for research. It is expected that universities will work on automation of production, development of semiconductors, the application of oxygen to metallurgy, the chemistry of radioactive substances, nuclear physics, machine tool design, the increase of crop yields, and so on.

Officials of the Soviet Academy of Sciences will be put under increased pressure to produce research results by a competitive device. One-fifth of the senior scientific posts will be put up annually for open competition. Formerly, such posts were lifetime assignments.

Genetics Congress Resolution

At the final session of the International Congress of Human Genetics which met recently in Copenhagen, Denmark, Herman J. Muller of the University of Indiana proposed the following resolution on radiation danger. It was passed unanimously by the approximately 400 participants.

"The damage produced by radiation on the hereditary material [of man] is real and should be taken seriously into consideration in both the peaceful and military uses of nuclear energy as well as in all medical, commercial and industrial practices in which X-rays or other ionizing radiation is emitted.

"It is recommended that the investigation of the amount and type of damage and of related genetic questions be greatly extended and intensified with a view to safe-guarding the well-being of future generations."

National Bureau of Standards To Be Moved

A tract of approximately 550 acres of land near Gaithersburg, Md., has been selected for relocation of the Washington laboratories of the National Bureau of Standards. The move will permit the bureau to plan new buildings to replace present research facilities, which have become inadequate for current needs. The new site was selected as most suited to the special requirements of the bureau's scientific and engineering programs. The choice was based on a number of factors, including accessibility by railroad and highway as well as topography for certain technical projects.

Congress appropriated funds for site acquisition and preliminary planning early in June after details about the pro-

posed site had been presented to House and Senate Appropriations Committees. Plans for the site have been given to the National Capital Planning Commission and to the Regional Planning Council, and it is expected that these groups will work with the bureau in utilizing the land. The General Services Administration will participate in planning and will supervise construction. Transfer of operations to the new location is expected to be completed in about 5 years.

The bureau occupied its present site on Connecticut Avenue in Washington in 1903. Since that time its responsibilities have greatly increased, largely as a result of the rapid expansion of technology and the growth of scientific research. Extensive programs of research and development must now be conducted in the physical sciences and engineering to meet the needs of science and industry for new and improved standards and measurement methods.

It is expected that the new location will make possible a more modern research operation in structures that can be very efficiently managed. In addition, the rural location will remove the bureau's work from the variety of mechanical, electric, and atmospheric disturbances present in a city and will reduce the effect of these forces on precise scientific measurements.

In addition to its Washington laboratories, the bureau maintains a major research center in Boulder, Colo., and 20 widely scattered field stations. The Boulder laboratories are concerned with radio propagation research, radio standards, and cryogenic engineering. Most of the field stations are engaged in gathering data on radio propagation.

Science, Secrecy, and Wall Street

It is perhaps of interest to note that recently the *Wall Street Journal* carried a full-page condensation of testimony on "The High Cost of Secrecy to Science" given by Gerard Piel, publisher of *Scientific American,* before the House Government Information Subcommittee. The article ends with the following paragraphs.

"Under our Constitutional principle of the separation of powers, our Congress has long opposed the human tendency in the Executive Department to make Government a private affair. It is an old experience in the administration of our country that secrecy can be a shield for incompetence and corruption.

"Now we have a new reason to oppose secrecy in the operations of the Government. It is the danger that secrecy lays to the advancement of science, and hence to the general welfare and to national security."

Nuclear Progress in India

India's first atomic reactor went into operation on Trombay Island, 13 miles from Bombay, on 4 Aug. This is the first reactor to be set up in Asia. Japan is running just behind India in the atomic field; its first reactor is due to start operating shortly.

The Indian reactor will turn out radioactive isotopes for use in biological, medical, and industrial research, and will be used to train nuclear scientists for further projects. A second reactor, provided by Canada under the Colombo Plan, will start operating by 1958. This will also be set up at Trombay, and will be a high-power, high-flux machine that will enable India to undertake advanced engineering research and the testing of materials connected with the more advanced types of power reactors.

To feed the reactors, India has vast potential supplies of atomic fuel. The beaches of Travancore-Cochin are rich in black monazite sands, bearing uranium, thorium, and zirconium. The thorium content of the sands is estimated at 100,000 tons—the biggest thorium deposits in the world. In Rajasthan, deposits of beryl have been discovered, and uranium-bearing materials have been located in Bihar, Udaipur, and Nellore.

A plant has already been operating for 4 years at Alwaye in Travancore-Cochin to process monazite sands for the extraction of uranium and thorium "cake." A second plant at Trombay processes the cake for the production of small quantities of pure thorium nitrate and uranium. Two more atomic fuel plants are being planned: one plant will extract uranium from copper tailings; another, to be set up at Nangal in the Punjab, will turn out heavy water as a byproduct of nitrogenous fertilizers.

The training of special workers was begun 11 years ago by the Tata Institute of Fundamental Research, so that when the government established its Atomic Energy Commission in 1948 there was already a small team of trained nuclear physicists. Today, there are 200 natural scientists on the staff of the Atomic Energy Commission's establishment at Trombay. By 1959 there will be 800.

In addition to Canada, other foreign countries have also helped Indian nuclear development. Britain has signed an agreement with India for "close cooperation and mutual assistance" on the peaceful uses of atomic energy and is providing enriched uranium as fuel for the first reactor. A British firm of consultants is helping to plan the heavy-water factory at Nangal.

The United States is also ready to cooperate with India and is supplying 21 tons of heavy water for use in the second reactor. France has been cooperating in the processing of the monazite sands. The U.S.S.R. has offered India any information needed on peaceful uses of atomic energy. India is also cooperating informally with Norway and Sweden.

Larger Orbit for Satellite

Improvement in the performance o the launching vehicle for the IGY earth satellite, including a reduction in the vehicle's weight, has led to new estimates for the orbit that may be attained, according to those in charge of Project Vanguard in the Office of Naval Research. It is now estimated that a satellite may attain a final velocity of 19,000 miles per hour instead of 18,000, and an elliptical orbit that could reach a maximal distance from the earth of some 1500 miles instead of the 800 originally predicted. Spokesmen for the project indicate that developments have gone better than expected and that recent rumors about unexpected difficulties are unfounded.

Heavy Water in Germany

The production of heavy water is of great importance in the atomic energy program. How far this program can compete with ordinary power stations depends to some extent on the price of the heavy water.

H. C. Urey and collaborators discovered the heavy hydrogen isotope in 1932 by the fractional evaporation of liquid hydrogen, and in 1943 Urey and engineers at the DuPont Company considered its industrial use. However, it was Clusius who suggested independently in 1941 that heavy water might be produced on an industrial scale by rectification of liquid hydrogen. He gave detailed calculations in 1949, and now K. Winnacker, Frankfurt (M)-Hoechst [*Physik. Bl.* **12**, No. 6, 274 (1956)], reports that an installation is being set up in cooperation with Linde Eismaschinen for a production of 6 tons of heavy water per year.

As starting material for the heavy hydrogen, ammonia synthesis gas of about 70 percent hydrogen, 20 percent nitrogen, and some impurities is being used. (The exact composition may vary from plant to plant. For example, at the Phillips plant in Etter, Tex., the gas contained 72.2 percent hydrogen, 24.1 percent nitrogen, and various impurities). Since in normal hydrogen only 1 atom of heavy hydrogen in about 7000 atoms of ordinary hydrogen is present, large amounts of synthesis gas (8500 cubic meters per hour) have to be processed. By cooling this gas with liquid nitrogen under a pressure of 8 atmospheres, most of the nitrogen is removed. The last traces of impurities