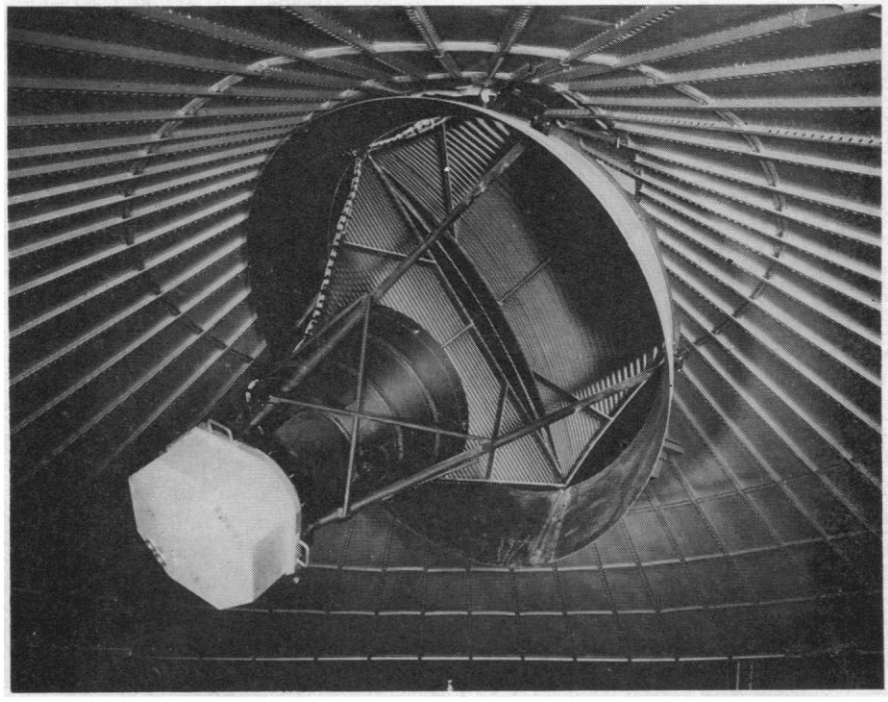
The afternoon sessions will be taken up with seminars, at which shorter papers will be read and discussed. Approximately 460 of these brief addresses, of which many will be read by title only, are listed in the program. Some of the titles for the first day's seminars are "Seismic waves from nuclear explosions and the structure under the Western Pacific," by D. S. Carder of the U.S. Coast and Geodetic Survey; "Pacific Oceanic crust," by R. W. Raitt and G. G. Shor, Jr., of the Scripps Institution of Oceanography; and "The exploration of an interplain deep sea channel," by A. S. Laughton of Great Britain's National Institute of Oceanography.

Among the tours and special events which are planned are a cocktail party at the American Museum of Natural History, a visit to the New York Zoological Park, a trip to the Bureau of Commercial Fisheries' Biological Laboratory in Milford, Conn., and various dinners. In addition, it is expected that the United Nations Building will be open for inspection. An information center will be located in the Hotel Commodore, 42nd St. and Lexington Ave., in the South Room, off the lobby. The center, which will also serve as a lounge for all registrants and guests, will be operated by the Woods Hole Oceanographic Institution.

U.S., International Atomic Energy Units Sign Contract

The first research contract between the U.S. Atomic Energy Commission and the International Atomic Energy Agency was signed recently. The contract makes $20,000 available to the IAEA for research on the production of calcium-47, an important radioisotope now in short supply. This is the first contract negotiated under the U.S. offer, made at the second IAEA General Conference, held in Vienna last October, to explore with the Agency a program in which specific research projects could be assigned by the United States to the Agency. The latter would then make contracts with existing nuclear centers and universities throughout the world. As explained to the Vienna conference by AEC chairman John A. McCone, then also chairman of the U.S. delegation, the objective is "to bring the wealth of scientific and technical competence throughout the world to bear on the advancement of peaceful uses of nuclear energy."

Calcium-47 is of great potential significance in biological and medical research. It can be used in clinical research and for limited routine diagnosis of disease. It can be used to study normal calcium metabolism, thus opening the way to investigations of malfunctions in calcium metabolism which occur in certain endocrine-gland and skeletal disorders. It is also expected to be of use in localizing the spread of bone tumors before they can be detected by conventional means such as x-rays. The contract calls for the IAEA to use the $20,000 in a research effort to develop a cheaper method of enriching calcium-46. The funds were allocated from the Atomic Energy Commission's Division of Biology and Medicine, and the contract will be administered by the commission's New York Operations Office.



Radiometer used by the U.S. Navy to measure the thermal power radiated by ocean surfaces. The device is attached to the underside of Naval airships.

Airborne Radiometer

The Naval Research Laboratory, according to a report in *Naval Research Reviews,* has been engaged for the past few years in a study of the physical properties of the oceans as revealed by measurements of radiant energy from their surfaces, with particular emphasis on the optics of the atmosphere and sea. One of the tools developed for this study is a massive radiometer designed to be flown in big Navy airships, at an altitude of 1000 feet. The instrument measures and records continuously the thermal power radiated by the sea, plus that small portion which orginates in the sky and is reflected from the sea.

Radiometers of two different configurations are employed. The first utilizes a single receiver. It consists of a parabolic mirror 100 inches in diameter, with a focal length of 70 inches. The second radiometer has a differential configuration. The 100-inch mirror is split along a diameter and is opened outward 15 degrees, thereby forming two independent collecting areas.

By means of the radiometers, much has been learned about the radiometric properties of the sea and their relationship to the state of the sea. For example, the radiometers have revealed that man-made oil slicks alter the wave structure enough to effectively improve the reflectivity of the surface where the slicks occur, thereby making those surfaces reflect more sky radiation. This means that the slicks are colder, in general, than the surrounding water. The radiometer has also shown that isolated clouds casting their shadows on the water during the day produce colder areas, while clouds at night produce warmer areas. The opacity of the clouds acts as a shield against incoming solar radiation during the day and, similarly, against reradiation to the cold sky at night. When these clouds drift on, they leave detectable warmer or colder patches on the water.

Cat's paws (water sufaces which have been ruffled by the wind) differ radio-

metrically from the surrounding sea. The difference is determined by many variables, such as cloud cover, time of day, and absolute humidity. Many local ocean currents may be identified by radiometric qualities that differ slightly from those of the surrounding sea. For example, it is easy to plot the edges of the Gulf Stream. Under some conditions it is possible also to follow the flow of rivers out into the ocean.

AAAS Theobald Smith Award

The Theobald Smith Award of $1000 and a bronze medal, which has been given yearly since 1937 (except for a lapse during the war years) by Eli Lilly and Company of Indianapolis, under the auspices of the American Association for the Advancement of Science, will be presented at the association's 126th meeting in Chicago, Ill., 26–31 December. Travel expenses will be paid by the donors to enable the recipient to receive the award in person.

Nominations are now being requested for the award. They may be made by fellows of the AAAS and should be sent to the secretary of the Section of Medical Sciences, Dr. Allan D. Bass, Department of Pharmacology, Vanderbilt University School of Medicine, Nashville 5, Tenn.

The prize is given for "demonstrated research in the field of the medical sciences, taking into consideration independence of thought and originality." Any investigator who was less than 35 years of age on 1 January 1959 and is a citizen of the United States is eligible. The research is not to be judged in comparison with the work of more mature and experienced investigators.

Nominations must be received before 1 September. All nominations should be accompanied by six copies of a two-page summary in the form of a letter of nomination which describes in detail the importance of the candidate's work; six copies of any manuscripts ready for publication; six reprints of each of the candidate's more important published articles; and six copies of a brief biographical sketch of the candidate.

The committee of judges consists of Wallace O. Fenn, University of Rochester School of Medicine and Dentistry; Arthur Kornberg, Stanford University School of Medicine; John J. Bittner, University of Minnesota Medical School; and Stanhope Bayne-Jones, technical director, Research Office of the Surgeon General, U.S. Department of the Army, Washington, D.C. Nathan W. Shock, Baltimore City Hospitals, chairman of AAAS section N (Medical Sciences), is chairman, ex officio; Dr. Bass will serve as ex officio secretary.

Antarctic Laboratory

The recently completed U.S. Antarctic Biological Research Laboratory has begun full operation. The laboratory, built and equipped through a National Science Foundation grant of $82,000 made to the Arctic Institute of North America, is located at the Naval Air Facility on Ross Island, McMurdo Sound. Work currently being performed by two biologists spending the winter there includes research in entomology, microbiology, and marine taxonomy. The laboratory and research work are part of the United States Antarctic Research Program arranged by the National Science Foundation in consultation with the NAS-NRC Committee of Polar Research.

An extensive survey of land invertebrates is now being conducted by Madison E. Pryor of the University of Tennessee, station scientific leader. Objectives of the research are to determine the kinds and numbers of invertebrates in the region, the relationships between plants and animals, and methods by which invertebrates have adapted to extremes of climate. Under study as part of a Stanford University project are the population characteristics of antarctic fishes, their growth rates and metabolic rates, and the identity, distribution, abundance, and ecology of inshore marine invertebrates. The project is under the direction of Donald E. Wohlschlag of Stanford, who was in the antarctic last summer.

Present plans call for extensive field work to be performed at the laboratory during the coming austral summer. The program will be expanded to include additional work in pathology and microbiology.

Machine Translation of Russian

Experiments in machine translation which the National Bureau of Standards has been performing for the Army Office of Ordnance Research now point the way to practical production of English text from Russian technical literature, according to the bureau's news bulletin. In a translation scheme recently developed, an electronic computer is instructed to weld together the English equivalents of the Russian word in a given text to make a meaningful reproduction of the original sentence. Studies have been carried out on a high-speed electronic computer by a member of the mathematical staff.

The machine is first instructed to change the words of a Russian sentence into a highly condensed form for matching in the glossary. The machine is then told to recognize the syntactical relations between the words. After this, it puts together the English words into a meaningful sentence. Expected improvements and short cuts in the programming, and use of the advanced computers now under construction, may reduce the expense to a point where machine translation will cost no more than employing a human translator.

Combined Curriculum

Columbia University and Wittenberg College, Springfield, Ohio, will offer a 5-year combined program in liberal arts and engineering, officials of the two schools announced recently. The plan will enable students to earn both the bachelor of arts and the bachelor of science degrees in a 5-year period. Under the program the student will study for 3 years at Wittenberg and for 2 years and a summer at Columbia's School of Engineering. After completing the graduation requirements of each institution, the student will receive a bachelor of arts degree from Wittenberg and a bachelor of science degree in a specialized engineering field from Columbia.

Columbia has arrangements with 41 other American colleges for such a combined curriculum.

Zero Gradient Synchrotron

Construction of a 12.5 billion electron volt particle accelerator, the Zero Gradient Synchrotron, has begun at the Argonne National Laboratory near Lemont, Ill. The facility is operated by the University of Chicago, under contract with the Atomic Energy Commission. Officials from Congress, the Atomic Energy Commission, and Argonne National Laboratory participated in the groundbreaking ceremony. Construction of the synchrotron, at an estimated cost of $29 million, is expected to be completed early in 1962.

Three buildings will be constructed for study purposes at different sites