



"The perennial mission of the Institute is to carry out scientific studies of earthquakes and allied phenomena and to search for the measures of mitigating and preventing the damage caused directly and indirectly by earthquakes. It is this mission that should be always remembered by those who enter this Institute. Nov. 13, 1935, Earthquake Research Institute." This excerpt is from the inscription at the entrance of the Earthquake Research Institute at the University of Tokyo.

A review of Japan's progress in the scientific and engineering fields will be the subject of a special symposium (26-27 December) at the 130th AAAS Annual Meeting in Cleveland, Ohio (26-30 December). Among Japanese achievements are discoveries in nuclear physics; Hideki Yukawa was awarded the Nobel Prize in 1949 for his prediction of the existence of mesons on the basis of theoretical work on the nuclear forces. The discovery of gibberellin, a kind of vegetable hormone, was made by Yusuke Sumiki of Tokyo University. This compound has aided farming techniques and has almost doubled grape yields in the United States. Progress is being made in medical research against cancer, polio, allergies, high blood pressure, and leprosy. The "Esaki diode," invented by Leo Esaki (now affiliated with I.B.M.) is widely used in electronics today. Statistics reveal that Japan did not export any of her technical "know-how" in 1952, but an amount in excess of \$2 million was earned by the Japanese in 1961 from the sale of patents and construction of industrial plants abroad. In order to intensify efforts in research, new institutes have been founded. The Institute of Solid State Physics (University of Tokyo, 1957) does basic research essential for the transistor industry and provides research facilities for outside scientists. The Institute for

Protein Research (Osaka University, 1958) is a comparable institute with facilities for work in the biological field. In Nagoya, an institute for molecular biology was established in 1961 for the study of the mechanisms of life at a molecular level.

While the world is now well aware of the important Japanese scientific advances, not many scientists are informed about the present state-of-the-art in Japan today. Thus the purpose of the symposium will be to provide American scientists with up-to-date reviews prepared by Japanese scientists. Each participant, selected by the Science Council of Japan, will be a well-known representative of the research area he discusses. The symposium will review the disciplines in which the Japanese are making particular progress—marine oceanography and biology, theoretical physics, human and plant genetics, seismology, optics, industrial microbiology, and organic chemistry.

It is hoped that this symposium will give the American scientific community a clearer view of research activities in Japan and will aid in fostering the idea behind the establishment of the U.S.-Japan Scientific Committee, that is, to bring scientists of the two nations closer together. The committee was formed in 1961 for the purpose of advancing science through coopera-

tive activities—exchange of scientific information, joint research on the Pacific Ocean, and research in the medical sciences—in which the participating countries provide both scientists and a part of the support. As a conclusion to the sessions Harry C. Kelly (dean of the faculty, North Carolina State College, Raleigh, and chairman of the U.S. delegation to the U.S.-Japan Committee on Scientific Cooperation) will trace the development of Japanese-American scientific relationships and discuss the organizational structure and future plans of the Committee.

One of the major problems encountered in the understanding of Japanese research is the fact that few American scientists can read or write the language of Japan; over 99 percent of the registered American scientists have no knowledge of the language. Although many Asian students go to Japan to study, few if any students from the main industrial countries go there to study science or technology. Plans have been made for simultaneous translation of all the lectures into English during the conference. All the papers are to be translated and printed in English before the sessions are held, and all are to be published afterward by the AAAS as a volume in the Association's symposium series. (Other volumes, comparable in content but dealing with different geographical areas,

THE SCIENCES IN JAPAN

Special Symposium at the AAAS Annual Meeting 26-30 December

are *Advances in Soviet Science* and *Sciences in Communist China*.)

About 350 journals of learned societies and associations, 520 bulletins published by national, public, and private universities and research institutions, and gazettes issued by the patent office are the major information sources about science and technology in Japan. Of the total literature emanating from Japan, only about 20 percent is published in English. This percentage is not representative of what appears in the remaining 80 percent. Efforts to ease the language barrier have been made by the Japan Information Center for Science and Technology (1957). This agency abstracts the world literature into Japanese and provides translating services for foreigners. Outside Japan, the Japanese language is being analyzed from a machine translation point of view at Washington State University and at Leningrad University. However, in order to acquaint Western scientists with the variety of topics and quality of information, an exhibit featuring journals of the more well-known Japanese scientific societies will be held in conjunction with the sessions.

Since early last year plans for these sessions have been discussed by officials of AAAS and the Science Council of Japan. Support for the conference was granted by the National Science Foun-

dation. In arranging the sessions, attempts were made to cover many fields of Japanese research and to select speakers on the basis of their scientific accomplishments.

The speakers and titles of their papers include the following: (26 Dec.) "Organization and financial support of scientific activities in Japan," (no speaker announced); "Recent developments in sociological studies in the modernization of Japanese society," Kizaemon Ariga (Keio University); "Development in Japan of the algebraic theory of numbers and allied topics," Shokichi Iyanaga (University of Tokyo), "Theory of computer circuit and logical design," Motinori Goto (Tokyo Institute of Technology); "Statistical studies on nonlinear control systems," Yoshikazu Sawaragi (Kyoto University); "Development of earthquake-resistant construction and its international cooperation," Kiyoshi Muto (Kajima Construction Co., Ltd.). (27 Dec., morning) "Ionosphere and space research in Japan," Ken-ichi Maeda (Kyoto University); "Recent developments and future program in Japan of high energy physics," Gyo Takeda (Tohoku University); "Recent developments in structural chemistry in Japan," Ken-iti Higasi (Research Institute of Applied Electricity); "Recent advances in the chemistry of plant components in Japan," Tatsuo Kariyone (National Insti-

tute of Hygienic Sciences); "Industrial microbiology in Japan," Koichi Yamada (University of Tokyo); "Studies of experimental Vincent's infection, with special emphasis on the role of *Neisseria septicaemiae*, new species," Masao Onisi (Tokyo Medical and Dental University). (27 Dec., afternoon) "Socioecological study of the Japanese macaque," Denzaburo Miyadi (Kyoto University); "Recent developments in experimental psychology," Kinichi Yuki (Hokkaido University); "Studies on lowland rice in Japan—ecological studies on the yield of lowland rice with reference to its components," Yoshiji Togari (University of Tokyo); "Origin of cultivated wheats in the light of recent genetic investigations," Hitoshi Kihara (National Institute of Genetics); "Recent advances in physiological and pathological studies of the silkworm," Tadao Yokoyama (Ministry of Agriculture and Forestry); and "Program of the U.S.-Japan Committee on Scientific Cooperation," Harry C. Kelly. All sessions will be held in the Grand Ballroom South of the Sheraton-Cleveland Hotel.

More information on the Cleveland meeting will appear in subsequent issues of *Science*. Complete details of the program will be given in the *General Program*, to be published early in December.