

No specific form for proposals has been recommended, although it is suggested that the handling of proposals will be facilitated if they are submitted in fifteen copies on letter size paper to the National Science Foundation, Washington 25, D. C. It is also suggested that proposals cover the following points, wherever applicable, in as complete a manner as possible: 1. name and address of institution; 2. name of principal investigator; 3. title of proposed research; 4. description of proposed research; 5. procedural outline of the research; 6. description of available facilities and major items of permanent equipment; 7. biographical sketch and bibliography of each person involved in project; 8. estimate of project's total cost and duration, with cost breakdown for each year; and 9. the signature of the principal investigator, department head, or an official authorized to sign for the institution.

National Science Board

New Officers Elected at Annual Meeting

Chester I. Barnard, president of the Rockefeller Foundation, was elected chairman of the National Science Board of the National Science Foundation at its second annual meeting held in Washington on December 3rd. Dr. Barnard succeeds James B. Conant, president of Harvard University, who was elected to serve the initial term as chairman of the Board on December 12, 1950. Edwin B. Fred, president of the University of Wisconsin, was re-elected vice chairman of the National Science Board. The new chairman and vice chairman were elected for two-year terms of office as prescribed by the National Science Foundation Act of 1950. Four members of the executive committee, whose terms had expired, were also re-elected. These were: Dr. Barnard; Detlev Bronk, president of the Johns Hopkins University and president of the National Academy of Sciences; Lee A. DuBridge, president of the California Institute of Technology; and Elvin C. Stakman, chief of the division of plant pathology and botany at the University of Minnesota.

Dr. Barnard, who plans to retire soon as president of the Rockefeller Foundation and General Education Board, was long associated with the American Telephone and Telegraph Company. He was president of the New Jersey Telephone Company prior to his association with the Rockefeller Foundation. During the war he was president of the United Services Organization. He was given the Meritorious Civilian Service Award by the United States Navy in 1944 and the President's Medal for Merit in 1946. He was a member of the Board of Consultants to the State Department on Atomic Control in 1946, which drafted the Acheson-Lilienthal Report. He was also a member of the Presidential Special Committee on Integration of the Medical Services in the Government in 1946. Dr. Barnard holds the degree of Doctor of Science from Rutgers University and the University of Pennsylvania and the LLD degree from Princeton and Brown Universities.

Dr. Fred has been president of the University of Wisconsin since 1945. A bacteriologist, he was chairman of the Advisory Committee on Biological Warfare of the National Academy of Sciences from 1941 to 1943. He has been a member of the National Advisory Health Council since 1945. He holds the Medal for Merit for his wartime services. Dr. Fred received his PhD degree from the University of Göttingen, Germany.

The executive committee consists of nine members to be chosen by the National Science Board, and the director of the National Science Foundation, member ex officio. The other five members of the executive committee are: Dr. Conant; Paul M. Gross, vice president of Duke University; Robert F. Loeb, director of medical services, Presbyterian Hospital, New York; J. C. Morris, vice president, Tulane University; and Alan T. Waterman, director of the Foundation. The smaller group is authorized to act for the 24-member National Science Board in such matters as the Board desires, with the exception of the establishment of policy or the review and approval of major matters. Members are elected to the executive committee for a two-year term.

Last month's meeting marked the beginning of the second year of operation for the National Science Foundation, which was created by Congress early in 1950. The director and staff of the National Science Foundation have initiated programs in support of basic research in the medical, mathematical, physical, engineering, and biological sciences. Applications are also being received for National Science Foundation graduate fellowships for the academic year 1952-53 in the same fields. The Foundation expects to award about 400 such fellowships. Application forms may be obtained from the Fellowship Office, National Research Council, Washington 25, D. C.

Fulbright Program, 1951-52

Travel Grants for Visiting Scholars

A total of 357 travel grants have been made to visiting scholars from abroad under the Fulbright Program for lecturing or advanced research in the United States, and approximately 45 additional applications are in process of review. These figures represent an increase of approximately 25% over those of 1950-51. It is interesting to note that the number of scholars coming to the United States under the Fulbright Program now exceeds the number of American Fulbright scholars going abroad. It should be pointed out, however, that the usual length of time for which an American scholar is granted an award is nine months. In contrast, approximately 50% of the foreign scholars remain in the United States from three to nine months.

One-third of the scholars are in the physical sciences, according to information from the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, under whose administration the program is conducted. Of the 119 physical scientists listed, 36 are chemists, 29 are engineers, 28

are physicists, and the remainder are in mathematics, geology, astronomy, or geography.

Among the physicists, the largest group comes from the United Kingdom, while eight other countries (Australia, Egypt, France, India, Iran, Italy, the Netherlands, and Norway) are represented by one or more physicists. A primary interest in research rather than in lecturing is indicated for the majority of the group listed.

The Conference Board Committee suggests that many of the foreign scholars lecturing or doing research this year at American colleges and universities would welcome invitations to visit other institutions providing the expense of the travel could be covered by the institution inviting them. A number of the visiting scholars have mentioned their interest in becoming acquainted with the various kinds of institutions of higher learning in the United States, especially those which differ from their sponsoring institutions. Invitations to visit other universities and colleges, especially those in proximity to their present locations, would therefore be appreciated.

The Committee has also suggested that in view of the fact that many professional meetings occur in the winter and early spring months, invitations to any of these scholars who will be in the United States at the time of these meetings will undoubtedly be appreciated by them. It is suggested that such invitations include clear information as to the expenses entailed in attendance because of the limited dollar resources of most of the visiting scholars.

Lists of the scholars involved, together with information concerning their fields of interest, present location, and so on, can be obtained by writing to the Conference Board of Associated Research Councils, Committee on International Exchange of Persons, 2101 Constitution Avenue, Washington 25, D. C.

Neutral Meson's Lifetime

Established by Rochester Group

In 1949, members of the University of Rochester Cosmic Ray Group reported the first clear-cut evidence for the existence of a previously unrecorded nuclear particle, the neutral meson, in the cosmic radiation. From measurements of tracks left in photographic emulsions it was established that large numbers of neutral mesons were produced as a result of the high energy collision between a helium nucleus contained in the primary cosmic radiation and a silver nucleus in a photographic plate. Recent findings of the Rochester group were reported in a paper presented before the American Physical Society meeting in Houston, Texas, on November 30th by Morton F. Kaplon and David M. Ritson, who announced that the lifetime of the neutral meson has been established as being about 10^{-15} second, the briefest existence yet determined for any elementary particle.

Drs. Kaplon and Ritson obtained their results by sending an "emulsion cloud chamber", consisting of a

stack of precisely-aligned electron sensitive plates separated by brass absorbers, twenty miles into the stratosphere attached to free balloons. The flight was made last spring at White Sands in New Mexico. Very energetic nuclear interactions at these altitudes produced large cosmic ray stars containing neutral mesons which decay into gamma rays, and which in turn initiate electron showers. Measurements leading to values for the energy of the particle and of the length of its track before disintegration make it possible to deduce the lifetime.

Research at Argonne

The Lead-Uranium "Clock"

A new procedure for analyzing lead and uranium ores which aids in the more precise determination of the age of the uranium ores has been developed in a joint research project at Argonne National Laboratory and the University of Chicago. Greatly increasing the sensitivity of the measurement of the four isotopes of lead in a given sample, the new technique has been successfully used in studying rocks containing as little as one part per million of uranium. Because it reveals more about the nature of the billion-year-old ores, the method may eventually contribute to more successful uranium exploration. The new means of analysis was developed by George Tilton and Clair Patterson, graduate students in the University of Chicago's Department of Chemistry. They worked under the guidance and with the assistance of Harrison Brown, associate professor of chemistry in the University's Institute for Nuclear Studies, Mark G. Inghram of the Institute and Argonne National Laboratory, and David C. Hess of the Laboratory's physics division.

Lead occurs in nature as a mixture of four isotopes of which the atomic weights are 204, 206, 207, and 208. The isotope 206 is the end product of a series of steps in radioactive decay which starts with uranium 238, the most abundant isotope of uranium. This fact has been used for some time to estimate the age of uranium-bearing minerals by what has become known as the "lead-uranium clock" method. By measuring the amount of lead 206 formed from the decay of uranium in such minerals and the relative proportion of uranium and lead, it is possible—since the rate at which uranium turns into lead is known—to calculate the age at which the mineral was formed. The Argonne-University of Chicago researchers wished to use this method directly on igneous rocks in order to learn more about the process in which minerals are formed. This application has been impossible in the past in view of the fact that the quantities of uranium and lead occurring in rocks amount to only about three and ten parts per million respectively. The new method of isotopic analysis improves the accuracy of the measurement of lead isotopes and requires only one tenth of a millionth of an ounce of lead, whereas previous methods required at least 200 times as much.

In order to test the procedure quantitatively it has been applied to the determination of the lead and